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NATIONAL SURVEY OF SEXUAL LIFESTYLES AND CHLAMYDIA TRACHOMATIS INFECTION IN SLOVENIA

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Abstract

A total of 849 men and 903 women participated in the first national general population probability sample survey of sexual behaviour and *Chlamydia trachomatis* infection in Slovenia. A combination of face-to-face interviews and anonymous self completion of questionnaires was used. Survey response rate was 67.0% and urine specimens were obtained from 82.7% of respondents.

The median age at first heterosexual intercourse declined from 18 to 17 years among men born during the late sixties and among women born during the late seventies. A substantial proportion of those who experienced early first heterosexual intercourse, regretted this, especially women, and a substantial proportion of these women had been persuaded or forced. Condom use increased during the late eighties and nineties which coincided with heightened AIDS awareness. Receipt of information on sexual matters from school lessons was associated with decreased risk of early first heterosexual intercourse among women and increased likelihood of condom use among men. There was great variability in the numbers of heterosexual partners between individuals of different ages, between men and women, and according to marital status. Men of all ages and any marital status reported higher numbers than women. Mean numbers of lifetime heterosexual partners for men and women were 8.3 and 5.6. Annual rates of acquisition of new heterosexual partners were 22.7% for men and 9.5% for women. Reported frequency of heterosexual intercourse showed high levels of consistency between men and women. Experience of vaginal intercourse was nearly universal. The great majority also reported oral heterosexual intercourse. Anal intercourse was reported by 31.6% of men and 22.3% of women. Having been forced into heterosexual sex was reported by 12.0% of women. At least one homosexual partner during the past five years was reported by 0.6% of men and 0.4% of women. Among 18 to 24 year olds 0.6% of men and 0.4% of women reported having injected illicit drugs during the past five years. All men who had sex with men also reported sex with women and all injecting drug users heterosexual sex with non-users. The prevalence of *Chlamydia trachomatis* infection among 18 to 24 year old sexually experienced individuals was 4.7%.

Sexual and reproductive health and life skills education programmes should be implemented in primary schools. An expert advisory group to the Ministry of Health should prepare recommendations for prevention and control of *Chlamydia trachomatis* infection.

Summary

This thesis reports the design, execution of, and results from, the first national general population probability sample survey of sexual behaviour and prevalence of *Chlamydia trachomatis* infection in Slovenia. Methodological strengths included a reliable general population sampling frame and use of well piloted data collection methods adapted from the National Sexual Attitudes and Lifestyles Survey (NATSAL) in the UK. Anonymous self administration might have contributed to improved validity of self reported information. Limitations of our survey include validity constraints of self reported information, and possible participation biases inherent to all behavioural surveys. By weighting the data we adjusted for different probabilities of selection according to age, differences in response and differences between the achieved sample and population estimates according to key demographic variables. By using survey functions in STATA in the analyses we were able to account for the weighting, clustering and stratification.

A total of 849 men and 903 women participated and urine specimens were obtained from 685 men and 764 women. Overall survey response rate was 67.0%, 63.3% among men and 70.9% among women. Urine specimens were obtained from 82.7% of respondents, 80.7% of male and 84.6% of female. The median age at first heterosexual intercourse declined from 18 to 17 years among men born during the late sixties and was followed by an equivalent decline among women born during the late seventies. The gender gap which had previously existed in the cumulative proportions of men and women experiencing first heterosexual intercourse before the age of 17 has closed for individuals born in the late eighties and early nineties. A substantial proportion of those who experienced early first heterosexual intercourse, regretted this having occurred, especially women, and a substantial proportion of these women had been persuaded or forced. Condom use increased during the late eighties and nineties and this coincided with heightened AIDS awareness. Thus, first heterosexual intercourse remained unprotected against unwanted conception and sexually transmitted infections in only a minority of men (20.1%) and women (19.4%) born during the late seventies and early eighties. For the majority, first heterosexual intercourse did not occur in the context of a stable relationship and curiosity was the most frequently reported triggering factor for men and increasingly by women. Receipt of information on sexual matters from school lessons was associated with decreased risk of early first heterosexual intercourse among women and increased likelihood of condom use among men. Our results show great variability in the numbers of heterosexual partners between individuals of different ages, between men and women, and according to marital status. Men of all ages and any marital status consistently reported higher numbers than women. Mean

numbers of lifetime heterosexual partners for men and women were 8.3 and 5.6, and means for the past year 1.4 and 1.0 respectively. Annual rates of acquisition of new heterosexual partners were 22.7% for men and 9.5% for women. Rates were higher among younger than older individuals and among previously married or single than married or cohabiting. Having engaged in a concurrent heterosexual partnership in the past year was reported by 13.5% of men and 2.8% of women. During the past five years 12.6% of men and 12.2% of women reported at least one foreign heterosexual partner and 2.6% of men reported paying a woman for sex. Reported frequency of heterosexual intercourse showed high levels of consistency between men and women. Lifetime experience of vaginal intercourse was nearly universal. The great majority also reported oral heterosexual intercourse. Anal intercourse was reported by 31.6% of men and 22.3% of women. Having been forced into heterosexual sex was reported by 12.0% of women. Homosexual attraction and experience were reported rarely and exclusively homosexual behaviour extremely rarely. Only 0.6% of men and 0.4% of women reported at least one homosexual partner during the past five years. Among 18 to 24 year olds, 0.6% of men and 0.4% of women reported having injected illicit drugs during the past five years. All men who had sex with men also reported sex with women and all injecting drug users reported heterosexual sex with non-users. The prevalence of *Chlamydia trachomatis* infection among 18 to 24 year olds was 4.1% and among sexually experienced individuals in this age group 4.7%. However, as 95% confidence limits were wide, the true prevalence in the latter group could range from 3.0% to 7.3%.

These results are the first national estimates for behavioural patterns that are key determinants for sexual health. They are expected to inform reproductive health policies and HIV and STI prevention and control strategies. Two immediate public health priorities have been identified. Sexual and reproductive health and life skills education programmes that integrate HIV and STI issues should be developed and a standard set of teaching tools designed to support the implementation in primary schools. An expert advisory group to the Ministry of Health should prepare recommendations for a national strategy for prevention and control of *Chlamydia trachomatis* infection. We hope to conduct another national sexual behaviour survey after a decade to examine changes. In the mean time, possibilities for attaching a sexual behaviour module and testing for *Chlamydia trachomatis* infection to probability sample health related general population surveys in Slovenia should be explored. Targeted behavioural surveillance surveys with testing for biological markers should be conducted in groups at higher behavioural risk for HIV and STI, especially men who have sex with men and injecting drug users. Possibilities for conducting a national *Chlamydia trachomatis* infection prevalence survey in a sample of general practices and gynaecologist outpatient services within primary health care should be explored.

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List of abbreviations

AIDS	acquired immune deficiency syndrome
CAPI	computer-assisted personal interviewing
CASI	computer-assisted self-interviewing
CATI	computer-assisted telephone interviewing
CI	confidence interval
CI_{95}	95% confidence interval
DFA	direct fluorescent-antibody assay
EIA	enzyme-linked immunoassay
FHI	first heterosexual intercourse
FVU	first void urine
HIV	human immunodeficiency virus
IAQ	interviewer-administered questionnaire
IDU	injecting drug users
IPHRS	Institute of Public Health of the Republic of Slovenia
LCR	ligase chain reaction
Log RT	Logrank test
NATSAL 1990	National Sexual Attitudes and Lifestyles Survey (1990/1991)
NATSAL 2000	National Sexual Attitudes and Lifestyles Survey (2000)
PID	pelvic inflammatory disease
PCR	polymerase chain reaction
SAQ	self-administered questionnaire
STD	sexually transmitted diseases
STI	sexually transmitted infections
UK	United Kingdom
UNAIDS	Joint United Nations Programme on HIV/AIDS
US	United States

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1. Introduction

1.1. Aims and objectives

Our aim was to conduct a survey of lifestyles, attitudes and health related to human immunodeficiency virus (HIV) and sexually transmitted infections (STI) with integrated testing for *Chlamydia trachomatis* in a probability sample of men and women aged 18 to 49 years in the general population of Slovenia.

Our broadly defined objectives were:

1. to describe the patterns of sexual behaviour in this population,
2. to assess the size of population groups with behavioural patterns known to be associated with increased risk for HIV or STI,
3. to identify demographic, social, and behavioural determinants of behavioural patterns known to be associated with increased risk for HIV or STI, and
4. to describe the distribution of *Chlamydia trachomatis* infection according to age and gender and explore demographic, social, and behavioural determinants of higher risk.

More specific objectives for this thesis, related to three areas of interest were:

- first heterosexual intercourse:
  - to describe the distribution of age at first heterosexual intercourse, and differences between men and women and birth cohorts,
  - to assess the proportion of men and women experiencing first heterosexual intercourse early (before the age of 16) and very early (before the age of consent - 15 years in Slovenia) and to identify demographic, social, and behavioural risk factors,
  - to describe contextual circumstances of first heterosexual intercourse, and differences between men and women and birth cohorts,
  - to probe the extent of regret and non-consensuality associated with first heterosexual intercourse,
  - to assess the proportion of men and women whose first heterosexual intercourse was unprotected against unwanted conception and sexually transmitted infections, to describe secular trends, and to identify demographic, social, and behavioural risk factors,
  - to assess the proportion of men and women who used a condom at first heterosexual intercourse, to describe secular trends, and to identify demographic, social, and behavioural predictors for condom use,

- to assess the proportion of men and women who used other contraception methods at first heterosexual intercourse and to describe secular trends,
- to describe important sources of information about sexual matters for men and women, perceived gaps in knowledge and desired sources of information,

➢ sexual partnerships, practices and HIV risk behaviours:

- to describe the distribution of numbers of heterosexual partners during different time periods (past year, past five years and lifetime) for men and women according to age at interview (birth cohorts) and marital status,
- to assess the proportion of men and women with multiple partners (at least two in the past year and at least 10 lifetime), and to identify demographic, social, and behavioural risk factors,
- to assess annual acquisition rates of new heterosexual partnerships for men and women and variability according to age at interview and marital status,
- to assess the proportion of men and women with concurrent heterosexual partnerships in the past five years and during lifetime, overall and according to age at interview,
- to assess the proportion of men and women with foreign heterosexual partners in the past five years and during lifetime, overall and according to age at interview, and to describe characteristics of the most recent such partners,
- to assess the proportion of men who have ever paid women for sex, and paid foreign women for sex while travelling or living abroad,
- to assess the proportion of men and women who have ever been paid for sex,
- to describe the distribution of frequency of heterosexual intercourse for men and women, and also by age at interview, marital and partnership status,
- to describe the distribution of heterosexual practices during the past year and lifetime for men and women, and also by age at interview,
- to assess the proportion of women, who were ever forced into sexual intercourse overall and also by age and marital status at interview,
- to assess the proportion of men and women who had homosexual experience and homosexual intercourse, ever and in the past five years,
- to describe the distribution of numbers of homosexual partners ever and in the past five years for men and women overall and according to age at interview and marital status,
- to assess the proportion of men and women who ever injected illicit drugs and the extent of heterosexual mixing of injecting drug users with non-users,

➢ *Chlamydia trachomatis* infection:

- to assess the proportion of *Chlamydia trachomatis* infection among men and women overall, and also by age at interview,

- to identify demographic, social, and behavioural risk factors for *Chlamydia trachomatis* infection.

Of the data collected in this survey, only the results of analyses according to the objectives described above are presented in this thesis. Other analyses will be conducted in the future, for example, on HIV and STI related risk reduction strategies, including condom use (except for condom use at first heterosexual intercourse which was already analysed), self reported STI, and sexual lifestyle attitudes.

1.2. Rationale for a sexual behavioural, background and methods

1.2.1. Need for a sexual behaviour survey in Slovenia

Reproductive health promotion including STI and HIV prevention and control was identified as one of the priorities in the National Health Programme of the Republic of Slovenia.[1,2] To inform reproductive and sexual health public health strategies it is crucial to understand the national epidemiology of STI and HIV which includes understanding sexual behaviour and monitoring changes.[3-5] Yet, not a single national sexual behaviour survey has been conducted in Slovenia until the year 2000. Two fertility surveys,[6-8] having had other objectives, did not collect much information on sexual behaviour patterns relevant for STI and HIV epidemiology. In contrast, almost all Western European countries have conducted national sexual behaviour surveys in probability samples of their general populations already in late eighties and early nineties[9] and the World Health Organisation has co-ordinated such surveys in many developing countries all over the world.[10-12] This was mostly in response to the emerging HIV epidemics, which focused attention on gaps in knowledge about sexual behaviour in the general population.

In Slovenia, HIV has affected mostly men who have sex with men, people with history of heterosexual sex in countries with generalised HIV epidemics and their partners.[13-18] The future of the currently low level HIV epidemic is uncertain. A national sexual behavioural survey was needed to provide the first national estimates for sexual behavioural patterns that are key determinants for sexual health. The data will be particularly useful to indicate how exposed the general population may be, to identify population groups at increased behavioural risk for HIV as well as other STI[3], and to assess their size. The information will be used to inform the development of well targeted prevention strategies and planning sexual health services.[4]

1.2.2. Sexual behavioural surveys in Europe

During the late eighties and early nineties, national general population sexual behaviour surveys were conducted in Belgium, Denmark, Finland, France, Germany, Iceland, Netherlands, Norway, Portugal, Scotland, Spain, Switzerland, and the UK.[9,19-26] The results had many potential uses, for example in the UK, they were used to model the extent of the HIV epidemic and to plan sexual health services and preventive interventions.[27-29] Many European countries repeat these national surveys to monitor changes in sexual and risk reduction behaviour, as well as in public attitudes towards sexual matters, for example France, Germany, Switzerland, and in the UK.[9,24,29-31] Information collected in many European as well as other national sexual behaviour surveys was also used for international comparisons.[10,11,32-34] Recently, a project

"Sexual behaviour and risk of HIV infection in Europe", funded by the European Commission, was aimed at collecting internationally comparable sexual behaviour data in surveys in several countries of the European Community.[35] Although numerous methodological differences between national general population sexual behaviour surveys may result in poor comparability of published results, and concluding about similarities and differences requires caution, our results are compared to the results of European surveys in the discussion (Chapter 8).

1.2.3. Sexual behavioural data relevant to HIV and STI epidemiology

Sexual behaviour patterns reported to be associated with increased risk for HIV or other STI include having numerous sexual partners,[36-43] having sex with a partner with many other sexual partners or a partner from a "core group" like commercial sex worker,[38,44,45] early age at sexual debut,[43] practising certain types of unprotected penetrative sexual acts (highest risk for anal intercourse,[36,46-50] and lowest for oral intercourse),[51-53] having vaginal intercourse during menstruation,[48,54] and not using condoms.[50,55-58] For people from low HIV and STI endemic countries, engaging in sex with foreigners from or while travelling or living in higher prevalence countries increases risk.[59,60] Having concurrent partnerships has also been associated with the increased risk.[61]

Sexual behavioural parameters suggested by modellers as crucial in the spread of HIV or STI include the proportion of people in different sexual activity categories according to the rate of partner change and frequency of sexual contacts per partnership (assortative mixing),[62,63] the extent of mixing of different sexual activity classes (disassortative mixing),[44,62-65] the extent of mixing of different classes according to other characteristics like age, sexual orientation,[62,66,67] and injecting drug use,[62,68] and the frequency and types of concurrent partnerships.[61,69-72] Most past sexual behaviour surveys failed to collect sufficient information for modelling purposes.[73] It is still poorly understood which parameters are most important for the course of HIV epidemic.[50]

1.2.4. Data collection methods

Various data collection methods were used in national AIDS/STI related behaviour surveys. Face-to-face interviewing was used in all surveys co-ordinated by the World Health Organisation[10] and in the Netherlands.[33] Self-administering questionnaires was used in Germany and Spain, and in a postal survey in Norway.[21,22,33] Postal sexual behaviour module was also attached to the face-to-face fertility survey in Slovenia.[74] Computer-assisted telephone interviewing (CATI) was used in Belgium, France, Germany, Scotland, Switzerland,[24,33,75,76] and

also in the US.[77,78] A combination of face to face interview with self-administering more sensitive questions was used in Finland, Germany, Portugal, and in the first survey in the UK,[79] as well as in the US.[80] The second national survey of sexual attitudes and lifestyles (NATSAL) in the UK used a combination of computer-assisted personal interviewing (CAPI) and computer-assisted self-interviewing (CASI), with respondents keying responses to questions displayed on the screen.[29]

Face-to-face CAPI may improve the quality, internal consistency and timeliness of the data.[81] It has been shown that respondents are more willing to reveal socially censured information in self-administered questionnaires or video-CASI than in the face-to-face interview.[82,83] CASI performed better in capturing sensitive sexual behavioural and injecting drug use information in the US adolescent population than "pencil and paper" self-administering technique.[84] Audio-CASI has been reported to be superior in capturing sensitive sexual behaviour information and injecting drug use information in the US adolescent population in comparison to "pencil and paper" self-administering technique[84] and also in capturing HIV risk behaviour among injecting drug users in comparison to CAPI and CASI.[85] In contrast, the pilot study for the NATSAL 2000 found no consistent evidence of CASI increasing reporting risk behaviour when compared to "pencil and paper" self-administering the same questions, but did demonstrate improved item response and data consistency.[86]

1.2.5. Sampling strategies and sampling frames

The sampling strategies in European sexual behaviour surveys differed from one country to the next according to the availability and access of sampling bases, the data collection technique and local research tradition.[33] Most surveys were conducted in probability samples of the population. For example, multi-stage stratified random sampling was used in Belgium, the Netherlands, and in the UK,[33,82] and random sampling was used in Spain.[33] French CATI survey used stratified random sampling of households in the telephone directory and then selection of individuals according to their birthday.[33] In contrast to probability samples, quotas were used at some stage in the West German survey as well as in the Portuguese and Swiss surveys.[33]

Population registries were used in Belgium, Finland, Norway, and Spain,[33] and a sampling frame based on a households registry in the Netherlands.[33] The list of residential addresses listed in the Post Office PAF was used in the UK survey.[82] Telephone directory sampling frames were used in CATI surveys in France and Switzerland.[20,24,75]

1.3. Injecting drug use as risk for HIV

One of the predominant modes of HIV transmission in many countries of Europe, Asia and US is through sharing of syringes and needles by those injecting illicit drugs.[3,18,87-90] In addition, a high proportion of heterosexually acquired infections is through transmission from injecting drug users (IDU) to their heterosexual partners.[3,87,88] Also, there is often interaction between cultures of drug use and commercial sex.[3,90,91] Alarmingly rapid spread of HIV infection occurred recently in many countries of Eastern Europe.[87,92-95] To assess the potential impact of IDU on HIV epidemic, it is important to estimate the extent of injecting illicit drugs, sharing of injecting equipment, sexual risk behaviour among IDU and sexual mixing with non-users.[5,96,97]

1.3.1. Injecting drug use in Slovenia

Slovenian IDU have thus far been spared extensive HIV infection burden.[13,14,16-18] However, it is feared that HIV might start spreading rapidly within this group and their heterosexual partners. The national estimate of 50-200 IDU per 100000 population during 1991 to 1996 obtained by key informant approach and nomination technique was rather unreliable.[98] Other methods, direct (enumeration, case-finding), indirect (multiplier methods, nomination techniques) capture-recapture methods, and related techniques[99,100] have never been used, neither was the prevalence ever attempted to be measured in a probability sample of the general population. Alarmingly, injecting drug use seems to grow rapidly. Number of clients on methadone maintenance rose from 26.5 per 100000 population in 1995 to 45.3 per 100000 population in 1998.[101,102] Community based data on sharing of injecting equipment are lacking, but it is encouraging that the proportion of clients entering methadone maintenance programme in Ljubljana that report sharing injecting equipment during the month preceding the treatment demand has declined from 69% in 1992 to 20% in 1996.[103] More recent analysis of information collected at first treatment demand in the national network of centres for prevention and treatment of illicit drug use during the period from 1997 to 2000 suggests that sharing injecting equipment during the month preceding the demand for treatment has stabilised at approximately 30% (unpublished information from the Institute of Public Health of the Republic of Slovenia-IPHRS). No information was available on the extent to which IDU have sex with non-users or are involved in commercial sex work.

1.4. Integration of testing for *Chlamydia trachomatis* infection

1.4.1. *Chlamydia trachomatis* infection

Chlamydia trachomatis infection is presumably the most common curable sexually transmitted infection in most countries of Europe as well as other developed countries.[104] When symptomatic, it presents in women as cervicitis, urethritis, Bartholinitis and pelvic inflammatory disease (PID, including endometritis, parametritis, salpingitis, oophoritis, pelvic peritonitis and pelvic abscess),[105] in men as urethritis, epididimytis, prostatitis, proctitis or Reiter's syndrome[106] and in infants born to infected mothers as neonatal conjunctivitis and pneumonia.[107] It is PID in women that presumably accounts for most of the serious acute illness and economic cost resulting from *Chlamydia trachomatis* infection.[108] Serum antibodies to *Chlamydia trachomatis* antigens have been strongly associated with PID[109] and *Chlamydia trachomatis* has been isolated from 5% to 60% of women with PID.[108,109] However, PID is also caused by other ascending genital infections including *Neisseria gonorrhoeae* and endogenous flora of lower genital tract.[109] Approximately 16% of women hospitalised and treated for PID will fail to conceive and 9% of those who do conceive will have ectopic pregnancy.[110] In addition, undetected and untreated fallopian tube infections are important cause of infertility and ectopic pregnancy.[111] *Chlamydia trachomatis* has been strongly associated with tubal ethiology of infertility[108,112,113] and ectopic pregnancy.[108,113-117]

In most infected women and many men symptoms of *Chlamydia trachomatis* infection are absent or minor.[106,118-121] This large group of asymptomatic and infectious persons sustain transmission within a community. Abundant information on prevalence of *Chlamydia trachomatis* infection is published from health care services based studies. Among sexually active adolescents attending different health care services in the US prevalence is 5%-15%.[122-124] In the UK prevalence rates from 0.5 to 29% were reported from different health care facilities surveys.[113,125] Results for other relatively accessible populations including military personnel,[126-128] youth in detention centres[129-131] and workplace-based populations[132] have also been published. In contrast, prevalence estimates based on probability sample surveys of the general populations are lacking, except for the UK.[133]

1.4.2. *Chlamydia trachomatis* infection in Slovenia

Chlamydia trachomatis infection is presumably the most common curable sexually transmitted infection in Slovenia.[134] During 1991 to 2000 annual reported incidence rates ranged from 1.4 to 6.3 per 100000 people.[134] These are clearly underestimated figures, resulting from extremely

rare microbiological confirmation of symptomatic infections and very low sensitivity of national surveillance based on mandatory reporting of diagnosed cases by clinicians. Slovenian studies reported *Chlamydia trachomatis* to be a common cause of cervicitis[135] and PID[136] among women, urethritis among men[137] and neonatal conjunctivitis and pneumonia among infants.[135] *Chlamydia trachomatis* has also been associated with tubal etiology for infertility.[116,117] The extent to which *Chlamydia trachomatis* infection causes ectopic pregnancy in Slovenia is not known, but, the rates from 9.7 to 14.7 reported cases per 1000 conceptions since 1985 to 1994,[138] which were similar to the rates in the UK and US[113,139] may reflect a substantial *Chlamydia trachomatis* infection problem. Four Slovenian studies of convenience samples of asymptomatic females in health care settings reported prevalence ranging from 6% to 16.5% [135,140-142] and two studies of convenience samples of asymptomatic men at an occupational medicine clinic in Celje reported a prevalence of 3.2%[137] and 2.7%.[143] It is impossible to extrapolate such results to obtain a true national picture.[134] To inform the development of a national strategy for the prevention and control of *Chlamydia trachomatis* infection, reliable information on the prevalence of *Chlamydia trachomatis* infection in the population is needed.

1.4.3. Integration of clinical measures of STI in behavioural surveys

The lack of national general population surveys that provide meaningful sexual behavioural and STI clinical data is almost universal, although, results from numerous clinical based studies can not be extrapolated to the general population. In the US, the nationally representative estimates of STI (syphilis,[144] herpes simplex virus-2,[145] and HIV[146]) were obtained in the National Health and Nutrition Examination Survey series that collect a broad battery of medical data, but scant behaviour information relevant to STI epidemiology.[147] The primary logistical barrier in adding STI testing to sexual behavioural surveys has been that blood or endocervical and urethral swab specimens were required for clinical tests. This is rather unpleasant for respondents, potentially lowers participation and requires that a data collector is a medical professional. Recent availability of new diagnostic tests for *Chlamydia trachomatis* and *Neisseria gonorrhoeae* that have high sensitivity and specificity using first void urine (FVU) specimens[148] greatly improved the feasibility of integrated representative surveys of STI and relevant behaviour. Sufficient participation in urine collection for *Chlamydia trachomatis* testing in pilot studies for several national surveys, the National Survey of Adolescent Males in US (85%),[147] the NATSAL 2000 (72%),[149] and this Slovenian survey (66%)[150] was encouraging. Also, a pilot study of the prevalence of *Clamydia trachomatis* infection in a US national household survey suggested that a reliable prevalence estimates could be obtained in a national probability sample survey.[151] The first estimate of the prevalence of *Chlamydia trachomatis* infection in a general population

probability sample sexual behaviour survey in a European country, the UK, has been published in December 2001.[149]

1.4.4. Laboratory diagnosis

The obligate intracellular life cycle of *Chlamydia trachomatis* has traditionally required laboratory diagnostic tests that are technically demanding, labour intensive, and expensive. Until recently, culture was considered gold standard with specificity that approaches 100%, but only 70 to 85% sensitivity in very experienced laboratories.[148] Non-culture, non-nucleid acid amplification technologies are based on direct visualisation of *Chlamydia trachomatis* by staining with fluorescein-labeled specific antibodies (direct cytologic examination or Direct Fluorescent-Antibody Assay (DFA)), immunohistochemical detection of antigen (enzyme-immunoassays (EIAs) and rapid tests), detection of hybridisation to a DNA probe, and non-specifically by measuring a marker of infection in urine (leukocyte esterase test).[148] Advantages of these methods were access to testing for laboratories lacking expertise or facilities to perform culture, reduced requirements for specimen transport and standardisation of technology.[148]

Recent development of tests for *Chlamydia trachomatis* laboratory diagnosis based on nucleid acid amplification technology, polymerase chain reaction (PCR) and ligase chain reaction (LCR) has been an important advance.[148,152] This technology is very sensitive, highly specific and offers the opportunity to use non-invasive, FVU specimens.[148,152] Reported improvement in sensitivity in comparison to tests in use was by as much as 30%.[153] PCR and LCR have been well evaluated for both urogenital swab and FVU specimens with sensitivity generally over 85% and specificity of 99 to 100%.[148,154-159] High specificity ensures an acceptable positive predictive value in screening low prevalence populations and requires no confirmatory testing before notification of result. However, FVU specimens may contain inhibitors for the LCR[160-162] and PCR assays.[161,163,164] Dilution was suggested as a possible approach to circumvent this problem.[162-164] New Amplicor PCR kit[165] has had an internal control incorporated[166] to identify inhibitory specimens and assure the integrity of negative results.[167,168] Of eight studies that compared performance of Amplicor PCR (Roche Diagnostics) and LCR (Abbott Laboratories) in urine specimens two reported higher sensitivity for LCR[164,169] and six for PCR.[155,170-174] Freezing and thawing before testing urine specimens improved the sensitivity of PCR[169,171] and LCR.[162] The drawback of these tests is high cost. Depending on the prevalence of infection, pooling of FVU specimens for testing may result in savings. Sensitivity and specificity of PCR and LCR were reported not to be affected by pool sizes of five[175,176] and four,[177] respectively. Of these two tests, PCR has been introduced in Slovenia.[178]

2. Preparatory work

2.1. Planning the survey, coordinating collaboration, and resources

The preparations for the first national general population sexual behaviour and attitudes survey were started at the IPHRS in 1996. The preparatory work and the main survey were coordinated by the head of the AIDS/STD Unit. Technical support has been provided by the London School of Hygiene and Tropical Medicine, since the survey was the subject of a PhD thesis of the principal investigator.

Fruitful collaboration has been developed with several institutions in Slovenia. The Institute of Social Medicine at the Medical Faculty co-operated in planning the preparatory work for the survey. The Faculty for Social Sciences participated in the preparation of the sampling strategy and adaptation of questionnaires for the feasibility study. The Statistical Office of the Republic of Slovenia designed the sampling strategy, provided the sample and recruited the interviewers for the feasibility study and the main survey. The CATI Centre developed the data entry software package, prepared data for entry and coordinated data entry in the feasibility study as well as in the main survey. The Institute of Microbiology and Immunology performed laboratory PCR tests for *Chlamydia trachomatis*. Finally, the Central Dermato-venerological Outpatient Service provided case management for some individuals diagnosed with *Chlamydia trachomatis* infection in the feasibility study.

Preparatory work, pre-testing and the feasibility study, were supported by a joint research grant of the Ministry of Science and Technology and the Ministry of Health within the Targeted Public Health Research Programme (Grant Number V3-8568-96) and by a separate grant of the Ministry of Health (Grant Number 2711-97-685502). The IPHRS ensured some of the resources needed for the main survey. In addition, resources were obtained from many different agencies and donors. The largest contributor was the Ministry of Health (Grant Numbers: 2711-98-685503, 2711-99-685503, 2711-99-826301, 10(423-127/99-2), 2711-00-685501, 423-60/00). Roche Diagnostics contributed all AMPLICOR *Chlamydia trachomatis* PCR testing kits. Other major donors were: Merc & Dohme Idea Inc., City Council of Ljubljana (Grant Number: 530-1/99-2), and Health Insurance Institute of Slovenia (Grant Number: 604-1/62-570/99). Additional smaller contributors were: UNAIDS, Regional Institute of Public Health Nova Gorica, Office of the Republic of Slovenia for Equal Opportunities, Copyright Agency of Slovenia, two Slovenian pharmaceutical companies Krka d.d. (Grant Number: 430-031-73/99) and Lek d.d., and a Slovenian retailer Maximarket d.d.

2.2. Data collection method

We considered different data collection methods that were used in other national sexual behaviour surveys. We assumed that validity of reported information about intimate sexual behaviour, possibly including socially undesirable behaviour, might be compromised, if collected by means of face to face interviews. We decided that posting self administered questionnaires to selected individuals was not an option, since, less than 40% response rate[74,179] was achieved in an attempted sexual behaviour postal survey, where the participants of the national Slovenian fertility survey[8] were asked to complete a short self administered questionnaire on sexual behaviour and mail it to the research team. Although, CATI is cheaper and faster than face-to-face interviewing, we concluded that we would not use this approach. Reasons were that it would be very difficult to administer a long interview over the telephone and also we would not be able to obtain a representative sample of the general population, since in 1995 only 75.5% households in Slovenia had a telephone,[180] a proportion of which were extra-directory. The introduction of CAPI by itself or in combination with CASI would require purchasing laptop computers and appropriate training of interviewers, and the latter method also reasonable computer literacy in all age groups of the surveyed population and advance piloting, for which resources were not available.

We decided to adapt the data collection method used in the first national Sexual Attitudes and Lifestyles survey conducted in 1990 and 1991 in the United Kingdom.[79] We collected the data by means of face-to-face interviews in combination with self administration of questionnaires. Interviewers asked less sensitive questions using an interviewer-administered questionnaire, while more intimate questions were anonymously answered by respondents in self-administered questionnaires, "pencil and paper", in the presence of interviewers. We also adopted the use of show-cards with letter pre-coded answers for more sensitive questions administered during face to face interviewing, so that possibly embarrassing sex related terminology would be avoided by answering in letter codes. The method was pre-tested and used successfully in the feasibility study before we proceeded to the main survey.

2.3. Development of questionnaires

Having identified very similar survey objectives, we decided to adapt the very well designed interviewer administered and self administered questionnaires used in the NATSAL in the United Kingdom in 1990.[181] Their extensive development work that included qualitative research to guide the design of the questionnaire, piloting, and using the refined questionnaires in the feasibility study[79] ensured that theses questionnaires worked well in this major study that enrolled nearly 19000 respondents. We appreciated the careful wording, attractive layout of the self administered questionnaires, and definitions for terms that may be difficult to understand (e.g. anal sexual intercourse).

We adapted the interviewer administered questionnaire and the self administered questionnaire extensively. No changes were made in the alternative self administered module for the first heterosexual intercourse. In the self administered questionnaires, we added many questions about condom use and also many detailed questions about three most recent partnerships during previous five years. This also ensured partial comparability with the European Union project "Sexual behaviour and Risks of HIV infection in Europe".[35] We also added questions to estimate some of the preventive indicators proposed by the former Global Programme for AIDS[182] and UNAIDS (knowledge of preventive practices, reported condom use with non-regular sexual partners, and reported STI incidence in men).[182,183] Questions on demographic and social characteristics were adapted to the Slovenian context in the interviewer administered questionnaire.

After pre-testing, we made several improvements which are described in the following chapter. With respect to the content of the self administered questionnaires, a new module with questions about the first homosexual experience was added as well as a few other questions, such as questions on partners of the respondent's partners, on sex with foreigners, and on whether respondents had ever been paid for sex. In pre-testing, we asked questions about the three most recent partners during the previous five years. We changed this into first asking questions about the current main partner, if respondent had one, and only then about two other most recent partners. If respondent did not have a main partner at the time of the survey, questions about three most recent partners during previous five years were asked.

After the feasibility study, we further refined the self administered questionnaire as described in chapter 2.8. No further changes in the content of the questionnaire were planned. We did, however, decide to split the self administered questionnaire into four booklets. This broke the previously rather lengthy self completion session into four shorter sections and, most

importantly, provided the possibility for interviewers to give short instructions how to answer the most essential or the most difficult questions in each booklet just before respondents started answering these.

The unedited English translation of the male version of all questionnaires (interviewer administered, alternative self administered module for the first heterosexual intercourse, and four self administered questionnaires) that were used in the main survey is provided in Appendices 3, 4, and 5.

2.4. Pre-testing

In June 1997, six experienced female interviewers from several regions of Slovenia conducted a total of 30 structured interviews using data collection procedures as planned for the feasibility study. Each was followed by recorded semi-structured discussions about the interviewing process. A standard set of open questions was used. The aim of this small scale pre-testing was to assess the performance and to revise the first draft of the questionnaire, to pre-test the proposed data collection method and to obtain some information necessary for planning the feasibility study.

Each interviewer recruited five respondents with defined eligibility characteristics regarding the gender, age group (16 to 54 years old), education, and marital status through her acquaintance networks. Close friends were not eligible. The research team provided addresses of four individuals with homosexual lifestyles who consented to participate. Additional lists with addresses of people with required demographic characteristics sampled from the Central Population Registry were provided in case convenience sampling through acquaintance networks would not suffice. Thus, respondents represented the range of characteristics of individuals eligible for the main survey.

The great majority of respondents felt that the introduction letter and the information leaflet were well designed and provided all necessary information. Terminology, definitions and wording in the interviewer administered questionnaire were clear and no missing categories for variables were identified. Respondents were comfortable using cards with letter pre-coded answers. Also, the terminology, definitions and wording of the self administered questionnaire were clear to the majority of respondents. A few spontaneously mentioned that the self administered module enabled them to respond comfortably and honestly to intimate questions. The outstanding complaint was the long duration of the interview. Accordingly, the

overwhelming majority of respondents suggested that the interview should be shortened. We estimated that approximately one hour was needed to administer the interviewer questionnaire and half an hour for the completion of the self administered questionnaire. One respondent claimed that she would not be willing to participate in a similar study again. Six respondents reported mild discomfort or slight embarrassment. Not a single one would prefer a male interviewer. They either expressed no preference or preferred females.

Interviewers were enthusiastic about using the cards with the interviewer administered questionnaire. It resulted in faster interviewing, provided confidentiality, if another household member passed by, and caused less discomfort for the respondent as well as the interviewer, as possibly embarrassing sex related words were avoided by answering with letter codes. Two main complaints from interviewers were the long duration of the interview and the extensive wording of the combined female and male version of the interviewer administered questionnaire. One interviewer reported the embarrassment of two adolescents, as parents insisted on being present during interviews. Interviewers recommended that invitation letters should be sent to all selected individuals before the interviewers' visits. Nothing specific for this particular survey was suggested for the doorstep approaches. Several interviewers made strong recommendation that incentives should be provided for respondents to improve the overall response rate. No additional interviewers' training needs were identified.

We identified two main problems with the self administered questionnaire. The first one was related to filtering mistakes. One respondent even interrupted the self completion session, due to his perception that the same questions were asked over and over again, as he was not following filtering instructions. The second major problem was the 15% non-response for questions on the history of STI. A different questionnaire format for these questions, with questions and answers set out in a table format, was suspected to have contributed to this.

Overall, no serious problems were detected. Since all 30 interviews were completed, the duration of the interview itself was not considered likely to threaten the completion rate. Nevertheless, we shortened the interviewer administered questionnaire and planned for a separate male and female version to gain time by avoiding interviewers having to work through complex Slovene wording accommodating both genders. To minimise filtering mistakes in the self administered questionnaire we inserted additional explanations into filtering questions. We concluded that respondents should be given more extensive instructions about how to complete the self administered questionnaire including hypothetical examples for the most important filtering questions. Consequently, more time was planned for training interviewers to acquire the skills to give relevant instructions. We planned a split run for the STI section in the

feasibility study, with randomly selected half of respondents receiving the old version of the STI related questions in a table format and the other half a version asking less information in a simpler way. We decided to send invitation letters to selected individuals in advance of interviewers' visits, to provide incentives for participants, and to use exclusively female interviewers.

Finally, we resolved not to include individuals below the age of 18 in the feasibility study for several reasons. Firstly, we assumed that the validity of responses would be questionable, if adolescents were interviewed in the likely presence of their parents. Secondly, we wanted to avoid possible problems in simultaneous negotiations to obtain the consent of both the selected adolescent and a parent. And thirdly, we wanted to avoid additional sensitive issues concerning interviewing adolescents likely to be raised by the Medical Ethical Committee at the Ministry of Health of the Republic of Slovenia after their initial reluctance to consent to such a sensitive study at all.

2.5. Ethical clearance

The Medical Ethical Committee at the Ministry of Health of the Republic of Slovenia consented to the proposed study on 17 October 1997 (Consent Number 25/10/96), under the condition that more sensitive information would be collected anonymously. In addition, ethical clearance of the London School of Hygiene and Tropical Medicine Ethics Committee (Application number 622) was obtained in December 1999.

2.6. Ensuring anonymity of intimate information

Anonymity of the information reported in self administered questionnaires was ensured according to the request of the Slovenian Medical Ethical Committee. All interviewers received a list of as many randomly selected unique numbers as addresses of selected individuals. They were instructed to use one of these unique numbers to link the interviewer administered questionnaire and self administered questionnaires for each respondent. These questionnaires did not contain identifying information. Separate forms to record visits to all selected individuals' addresses and their outcomes were also completed (unedited English translation is provided in Appendix 9). Obviously, these forms included identifying information about respondents as well as non-respondents. However, the allocated respondents' unique numbers recorded on the questionnaires were not recorded on the forms to record the outcome of all

visits to selected individuals addresses. Also, the two data sets, the visits' records data set and the main data set including information reported by respondents, were entered separately in two different locations, at the IPHRS and at the CATI Centre respectively. Thus, the identity of each respondent was unlinked from the demographic, behavioural and attitudinal information reported.

2.7. Linking *Chlamydia trachomatis* testing results with anonymously reported information

The results of voluntary confidential testing for infection with *Chlamydia trachomatis* were linked to the anonymously reported information in the self administered questionnaires. The allocated respondents' unique numbers were recorded on urine specimens. Both, the unique identifying numbers and the respondents' names were recorded on two separate parts of each urine specimen laboratory form (unedited English translation is provided in Appendix 8). After the test results were recorded on both parts of these forms in the laboratory, the forms were cut in two parts, those with the unique identifying number and those with names. The parts with the names were sent to the IPHRS, so that infected individuals could be notified and referred for treatment. The parts with the unique identifying numbers were sent to the CATI Centre, where the tests' results were linked with the information reported by respondents.

2.8. Feasibility study

The fieldwork for the feasibility study was conducted from November 1997 to February 1998. Our aim was to assess acceptability of the main survey goals, the chosen data collection methods, to pilot all other fieldwork procedures in a representative sample of at least 500 respondents, and to obtain some information we needed to plan the main survey. In addition, we wanted to assess the feasibility of collecting first void urine specimens to be confidentially tested for *Chlamydia trachomatis* infection in a small convenience sub-sample.

We sampled 1000 individuals' addresses from the Central Population Registry by two stage probability sampling. The sample was stratified according to 12 statistical regions. Firstly, 100 primary sampling units, with approximately 200 inhabitants, were sampled with a probability proportional to size of their 18 to 54 years old population. Then ten persons 18 to 54 years old were randomly selected from each.

With the exception of a few adaptations made before the main survey, the survey methods were identical to those we used in the main survey. The differences were as follows. In the feasibility study invitation letters were mailed to selected individuals at the beginning of the fieldwork, which often resulted in a rather long time lag between the arrival of letters and visits of interviewers. In the main survey, interviewers mailed letters before they started working in particular area. The questionnaires used in the feasibility study were slightly different, as they were still further refined before the main survey. Also, two versions of self administered questionnaires, differing in the module with questions related to STI, were randomly assigned to respondents in the feasibility study to assess which version was likely to perform better in the main survey. In the feasibility study only four interviewers working in Ljubljana with 120 allocated individuals' addresses, were instructed to invite respondents to contribute first void urine specimens to be tested for *Chlamydia trachomatis*. In contrast, all respondents in the main survey were invited to contribute first void urine specimens. In the feasibility study, urine specimens were transported to the laboratory in iceboxes within 24 hours after collection by interviewers. In the main survey, the specimens were first transported in iceboxes to interviewers' homes, where they were frozen and stored at -20^{0}C, and then transported to the laboratory once per two weeks by the survey co-ordinating team. In the feasibility study Amplicor PCR tests for *Chlamydia trachomatis* were performed on individual specimens within a week after collection. In the main survey, screening tests were performed on thawed specimens in pools of five. Since infected respondents in the feasibility study resided only in Ljubljana, we referred them for treatment and counselling exclusively to the Dermato-venerology outpatient clinic in Ljubljana. This was not feasible in the main survey, where infected respondents were from all parts of Slovenia. Thus, we referred them for treatment to their general practitioners or, if females, also to gynaecologists. In the feasibility study the completed questionnaires and forms were mailed to data entry locations. In contrast, in the main survey, we collected the questionnaires from interviewers' homes once every two weeks at the same time as transporting urine specimens to the laboratory. In the feasibility study 20% of data was double entered to assess the quality of data entry. In the main survey we double entered all the data.

Overall, interviews were conducted with 752 out of 971 selected individuals who were either confirmed to be eligible or assumed to be eligible, resulting in the estimated overall response rate of 77.4%. Women were more likely to participate than men ($p<0.01$), young more likely than old ($p<0.01$), and people from smaller communities more likely than those from larger ($p<0.01$).

Crude preliminary prevalence estimates together with 95% confidence intervals (CI_{95}) for rare behavioural patterns associated with increased risk for HIV and STI were obtained assuming random sampling. Ten or more heterosexual partners during the 5 years preceding the interview were reported by 2 % (CI_{95} 1% - 3 %), and during lifetime by 14% (CI_{95} 12% - 17%) of respondents. Slightly more then 2% (CI_{95} 1% - 4%) of male respondents reported having ever paid a woman for sex and less then 0.5% (upper CI_{95} <1%) having had homosexual sex during the past five years. To have injected illegal drugs was reported by 0.5% (upper CI_{95} <1.0 %) of respondents.

Self reported lifetime prevalence of all STI combined was 6% (CI_{95} 3%-10%) for respondents who received the self administered questionnaire where STI related questions were laid-out in a table format and 3% (CI_{95} 1%-6%) for those who received the simplified version of the questionnaire.

Of 43 male and 40 female respondents invited to provide FVU specimen for *Chlamydia trachomatis* testing, 24 male and 31 female respondents complied, resulting in 56% participation rate among men, 76% among women, and 66% among all respondents. Two individuals, a man and a woman, were diagnosed with *Chlamydia trachomatis* infection.

The remaining main problem identified in the performance of the self administered questionnaire was that many respondents omitted their current steady partner from the total count of sexual partners for different periods of their life. As we started with the questions about the numbers of partners during lifetime and then only asked questions for more recent lifetime periods, some respondents with a single lifetime partner, tended to inappropriately filter and skip all questions about the number of partners during more recent periods. Consequently they also skipped all questions about condom use and frequency of sex during more recent periods.

We were encouraged by the high overall response rate, which indicated that we could expect good acceptability for the planned main survey. Preliminary prevalence estimates for rare behavioural patterns associated with increased risk for HIV and STI enabled sample size calculations for the main survey, which are presented in Annex 1.

We decided to split the self administered questionnaire into four booklets as described in the chapter about the development of questionnaires. We also resolved to change the order of questions asking about the numbers of partners during different periods and to start with questions for the most recent period last month, and to proceed with questions for the last year, last five years and finally lifetime. By this, we hoped to aid the recall and to improve the

validity of reported figures, since respondents would be adding-up numbers of partners gradually going back in their memory from the most recent period to those more distant. Although there was no conclusive evidence on which version of STI related questions performed better, we resolved to keep the table layout version, since there was some indication that it may capture the history of STI better and as it was asking for more detailed information. Before proceeding to the main survey, we also planned for changes of some of the fieldwork procedures, as already described above.

It proved feasible to collect first void urine specimens for *Chlamydia trachomatis* testing. Disappointingly, the participation rate in the small convenience sub-sample was not as high as desired. As the numbers of respondents invited to contribute FVU specimens were small the actual measured participation rate was rather imprecise as a predictor of participation rate in the main survey. Also, targeted individuals were not randomly selected and it is well recognised that any response rate tends to be worse in the capital than elsewhere. No major logistical barriers were encountered during collection of FVU specimens, laboratory testing, and referring infected individuals for treatment. Thus, we decided to proceed with the integration of testing for *Chlamydia trachomatis* infection in the main survey.

3. Methods

3.1. Sampling

3.1.1. Reference population

The reference population for our survey consists of Slovenian citizens 18 to 49 years old currently resident in Slovenia. The Central Population Registry at the Ministry of the Interior includes information on our entire reference population. It is continuously updated, and provides an excellent sampling frame. The information on permanent addresses may prove inaccurate for approximately 5% of individuals, but it is often possible to trace these individuals to their new permanent addresses and to invite them to participate in the survey.

We excluded approximately 3% of Slovenian citizens who lived abroad. A proportion of them may visit Slovenia often. They may constitute an important group for the epidemiology of HIV and sexually transmitted infections. But, except for rare individuals visiting during the survey period that could be invited to participate, it is impossible to include this group. A total of 43633 Slovenian citizens were estimated to live abroad by the end of 1999[184]. We also excluded foreigners living in Slovenia. They also may be epidemiologically important. However, it proved difficult to obtain the relevant sampling frame from the Ministry of the Interior. In addition, language barriers might make it costly and difficult, if not impossible, to survey this relatively small group. Only 42524 foreigners were registered to live in Slovenia by the end of 1999[184], which constitutes approximately 2% of the total population. Of those, 92% were citizens of countries that emerged from the former Socialist Federal Republic of Yugoslavia (Croatia, Bosnia and Herzegovina, Serbia, Montenegro, and Macedonia).

3.1.2. Sample size and over-sampling young

Initially we aimed to survey a representative sample of the general population from 18 to 54 years old. We estimated that a sample size of 8000 respondents would be adequate:

1. to estimate the prevalence of diverse sexual behavioural patterns in different age groups of men and women with sufficient precision,
2. to recruit sufficient number of people with rare behavioural patterns associated with increased risk for HIV or STI to describe their demographic, social, behavioural and attitudinal characteristics,

3. to estimate the prevalence of *Chlamydia trachomatis* infection in different age groups of men and women with sufficient precision, and
4. to have sufficient power (80% or higher) to recognise as significant (at the 95% confidence level) moderate associations (e.g. odds ratio 2) of moderately frequent key demographic and behavioural characteristics (above 10%) with *Chlamydia trachomatis* infection.

The calculations of the desired sample size were based on the results of the feasibility study. As difficulties in obtaining funding for surveying 8000 individuals were anticipated, we considered the implications of sample size reductions for our objectives. The calculations regarding the implications of reducing sample size, narrowing respondents' age span, and over-sampling younger age groups for the survey power and precision are presented in Annex 1. It was concluded that surveying approximately 2000 respondents would still provide useful information, however, narrowing the respondents' age span and over-sampling the young would have to be considered and corresponding loss of precision and power should be accepted.

Eventually, funding for a survey of only 2000 individuals was ensured, with some prospects to increase the number to 4000. Thus, we resolved to include only individuals 18 to 49 years old and to sample those aged 18 to 24 with twice the probability in comparison to those aged 25 to 49 years. We judged that such an approach would ensure obtaining useful information on infection with *Chlamydia trachomatis*, while still sampling from older age groups would provide an appropriate age span of respondents for the baseline description of sexual behaviour of the Slovenian general population and for comparability of our results with national sexual behaviour surveys recently conducted in several countries of the European Union[185].

3.1.3. Sampling strategy

We estimated that to include approximately 2000 respondents into the survey, we would have to sample 2700 individuals. The estimate was based on experiences gained from previous national surveys and the results of our feasibility survey. We expected that interviewers would find approximately 3% of sampled individuals to live abroad, thus, not eligible. An additional 7% of sampled individuals were expected to either live at a temporary address during the survey period or to have moved to a new permanent address. We assumed an overall response of 50% among the individuals of the latter group, many of whom may prove impossible to trace and contact. For individuals living at permanent addresses as recorded in the Central Population Registry, we assumed a response of 80%.

We used stratified two-stage probability sampling. The sampling frame was designed using the list of enumeration areas and information from the Central Population Registry. Within 12 statistical regions (explicit strata), we defined a total of 47 implicit strata according to six sizes and types of communities: rural communities with less than 2000 inhabitants, non-rural communities with less than 2000 inhabitants, communities with 2000 to 9999 inhabitants, those with 10000 to 100000 inhabitants, and two cities with more than 100000 inhabitants, Ljubljana and Maribor. The whole sampling frame included 9850 primary sampling units, either enumeration areas on their own, or several smaller ones joined together. The average number of 18 to 49 years old inhabitants in each was approximately 120, ranging from about 20 to about 300. Primary sampling units were sorted by sizes and types of communities within each statistical region, and then a systematic sample of them was selected.

Firstly, we selected 270 primary sampling units with replacement and independently from all 12 regions (explicit strata). Individuals 18 to 24 years old were over-sampled, with twice the probability of inclusion in comparison to those 25 to 49 years old. Each primary sampling unit was selected with a probability proportional to the size of the eligible population. That was the sum of the number of individuals aged 25 to 49 years and twice the number of individuals aged 18 to 24. Then, on average, 10 individuals 18 to 49 years old were selected from each. The actual numbers varied from 9 to 11. The reason for this variation was, that due to over-sampling the young, the estimated required numbers of 18 to 24 years old individuals as well as of those 25 to 49 years old in each selected primary sampling unit were usually decimal figures.

The equations for selection of individuals into the sample were as follows:

for 18 to 24 years old: and for 25 to 49 years old:

$$\frac{(1+p_a)N_a}{\sum_{Slo} N_a} \cdot \frac{\frac{2p_a}{1+p_a} b}{p_a N_a} \qquad \frac{(1+p_a)N_a}{\sum_{Slo} N_a} \cdot \frac{\frac{1-p_a}{1+p_a} b}{p_a N_a}$$

Where:

p_a is the proportion of individuals aged 18 to 24 among 18 to 49 years old individuals in a selected primary sampling unit,

$(1 - p_a)$ is the proportion of individuals aged 25 to 49 among 18 to 49 years old individuals in a selected primary sampling unit,

$(1 + p_a)$ is the sum of the proportion of individuals aged 25 to 49 and twice the proportion of individuals 18 to 24 years old in a selected primary sampling unit,

b is the average number of individuals sampled from each selected primary sampling unit

N_a is the number of all individuals in each primary sampling unit

3.2. Field work organisation

3.2.1. Time frame

In September 1999, when sufficient resources were ensured for at least 1000 individuals to be interviewed, we decided to start with the fieldwork. By then, it also seemed very likely that during the year 2000 we would be able to ensure further funding to survey at least additional 1000 individuals. We planned field interviewing in two waves. The first was to cover somewhat more than half of the country, the central, northern and north eastern part of Slovenia. The second, planed to start early in 2000, was to cover the rest of the country. This geographical split simplified the logistics of the transport of urine specimens and other survey material from the field and reduced the cost.

The first wave of interviewing started in November 1999, with the first interview conducted on the 14th. The second wave started in February 2000. By end of July 2000, 1711 interviews, 98% of all, had been conducted. A rather long sweeping-up period followed. In fact, in early autumn 2000, we were still negotiating to obtain additional funding to increase the sample size. If we were successful, we would allocate additional selected individuals' addresses to interviewers all over Slovenia. When in October, it eventually became clear that resources to further increase the sample size would not become available, we instructed the last interviewer to conclude the fieldwork. The last six interviews were conducted as late as early 2001, the very last one on the 15th February. Importantly, this long fieldwork split into two waves, made it possible to obtain the funding from the Ministry of Health during two different fiscal years.

3.2.2. Recruitment and training of interviewers

Altogether 39 female interviewers from all over Slovenia were recruited from the pool of interviewers used by the Statistical Office of the Republic of Slovenia. Of these, 18 had already participated in the feasibility survey. The first 22 interviewers were trained at a full day workshop in November 1999. Since it proved rather difficult to follow the very intensive full day training programme, the following two workshops, in February and in March 2000, were planned for two half days.

The principal investigator conducted all three training workshops. Overall aims of the survey and some results of the feasibility study were presented first. To avoid lengthy gaps between introductory letters and interviewers' visits, interviewers were instructed to post these letters

themselves before the start of working in particular areas. The need for confidentiality was stressed and the procedures to ensure anonymity of most sensitive information while still preserving the link between all information reported by each individual respondent were explained. Instructions on appropriate doorstep approaches were given. The need to obtain appropriately informed consent by offering to read the leaflet with information about the study was emphasised. We urged the interviewers to insist on conducting the interview in privacy with the respondent. Instructions were given on how to complete the forms to record the visits to selected individuals' addresses, the forms to notify temporary addresses or new permanent addresses, the forms to record the number of conducted interviews, the number of obtained urine specimens, and respective mileage. Detailed instructions on interviewing procedures using the interviewer administered questionnaires were given. The greatest emphasis was placed on developing the skills for appropriate introduction of questionnaires for self completion. Interviewers were instructed to provide respondents with additional explanation about anonymity and quite detailed instructions on how to respond to the questions in self administered booklets. This was expected to encourage respondents to answer honestly and to prevent as many mistakes as possible. Each interviewer had to role-play the introduction of self administered booklets. Finally, instructions were given on how to approach respondents with requests for urine specimens, how to complete the laboratory form, how to label specimens, and how to transport and store them. Interviewers were told in advance that a parallel computer assisted telephone interview would be conducted on a proportion of the survey sample to control for whether their field work procedures were in accordance with instructions.

Within a week after the training, the principal investigator visited all interviewers at their homes. Individual feedback was given on whether the first few interviewer-administered questionnaires and all other forms were completed correctly. The skills to correctly introduce the self administered booklets were further strengthened during these individual sessions.

Three interviewers dropped out very early, one after having conducted only one interview, one after a respondent interrupted the second interview, and the third one after three interviews. An additional three interviewers dropped out later, one after seven interviews, one after 10, and the last one after having conducted 16 interviews. The remaining addresses initially allocated to them were reallocated to interviewers working in adjacent areas. The remaining 33 interviewers worked until they covered all allocated selected individuals' addresses. On average, they conducted 52 interviews each, ranging from 27 to 88.

3.2.3. Interviewing procedures

Before the visit of an interviewer all selected individuals received an introductory letter explaining the survey goals and that they had been randomly selected from the general population to be invited to participate. The letter provided information about the institutions conducting the survey and major funding agencies including the Ministry of Health and the Ministry of Science. The unedited translation of the letter into English is provided in Appendix 1.

Details of all visits and their outcome to individual addresses and ascertained residence status were recorded on visits record forms (Appendix 9), which were completed for every selected individual. Interviewers were required to make at least five calls at different days of the week and at different times of the day before accepting any selected individual's address as non-contact. As interviewers worked in relatively small areas often more than five calls were made. Some demographic characteristics information about non-respondents was obtained from the Central population registry and we did not attempt to collect any additional information.

At the doorstep, interviewers introduced themselves with interviewers' identity cards with the interviewer's photograph and the name of the survey. Permission to briefly explain the study aims was asked for. Respondents were invited to read a short leaflet providing general information about the study and how they were selected into the sample. The fact that most intimate questions would be answered anonymously was explained. Also, the right to refuse to participate in the study, to interrupt the interview at any point or just not to answer an individual question was explained. The leaflet also listed the interviewers' professional duties, and provided information about the research team, the participating institutions, and funding sources. This leaflet was left at respondents' homes. Two research team addresses were given at the end, in case further information was needed. Interviewers provided additional explanations only upon request. The unedited translation of the information leaflet into English is provided in Appendix 2. It was anticipated that some selected individuals would claim that their particular lifestyle was not relevant for such a survey. Had this occurred, all interviewers were instructed to stress the necessity to capture all the diversity of specific lifestyles and attitudes, whatever they may be, from as many selected individuals as possible, to obtain accurate results for the population.

After such verbal informed consent had been obtained, interviewing started with less sensitive interviewer administered questions. The unedited translation of the male version of the interviewer administered questionnaire into English is provided in Appendix 3. Initial questions

about health, family and religious affiliation facilitated the development of good rapport. Then, show cards with letter pre-coded answers were introduced to facilitate answering more sensitive questions that included questions on sources of information about sexual matters and age at first heterosexual experience and intercourse. This presumably resulted in less discomfort for respondents as well as interviewers, as possibly embarrassing sex related words were avoided by answering with letter codes.

Those respondents who reported their age at first heterosexual intercourse were asked several questions about the event. A great majority were asked face-to-face (Appendix 3). Very few, 1.0% men and 1.3% women, completed self-administered booklet (Appendix 4). This alternative was provided only when interviewers judged that it was not private enough to ask these questions face-to-face. Unedited translation of this alternative self administered module in English is provided in Appendix 4. This was only offered when interviewers judged that this would be more appropriate as it was not private enough or when the respondent was perceived to be rather uncomfortable.

Only those respondents who reported their first heterosexual intercourse or some other sexual experience were invited to complete several self administered questionnaires anonymously, but, in the presence of interviewers. Sexual experience was defined any kind of contact with another person that respondent felt as sexual (e.g. kissing, touching, intercourse, or any other form of sex). These booklets included questions about sexual behaviour, injecting drug use, and sexually transmitted infections. The translation of the male version of these questionnaires into English is provided in Appendix 5. Each of the four questionnaires was briefly introduced before giving it to the respondent to prevent as many mistakes as possible. Instructions included hypothetical examples about how to answer the most important and most difficult questions and about how to skip inappropriate questions. It was stressed in advance, that interviewers would not see the answers, but could provide additional explanations using hypothetical examples and an empty questionnaire. Respondents were also told in advance, that they would themselves seal the completed booklets in envelopes with the IPHRS logo.

The interviewer administered questions about respondents' attitudes followed (Appendix 3). This sequence aimed at minimising social desirability bias for the anonymously reported behaviour. For example, if respondents were first asked face to face whether they approve extramarital affairs or not, they might be less likely to report such behaviour if asked about it afterwards. The interviews concluded with questions about demographic and social characteristics, the information least likely to be reported incorrectly at the end of a rather long interview, when concentration may have dropped (Appendix 3).

Finally, respondents were thanked for their important contribution and given tee shirts with the IPHRS logo as a symbolical reimbursement for their time and effort. This timing, just before asking for a urine specimen, was intentional and aimed at increasing the urine specimen contribution rate.

3.2.4. Collection and storage of urine specimens

After the conclusion of the interview, all respondents were asked for an additional few minutes of their time and were invited to participate in the extended study by contributing their urine specimen to be confidentially tested for *Chlamydia trachomatis*. They were invited to read a letter explaining the aims of such testing. The unedited translation of this letter into English is provided in Appendix 6. The letter stressed confidentiality of results and that in case of positive results respondents would be notified within a month and referred for treatment. If respondents agreed, the informed consent forms were signed and instructions were given on how to obtain the FVU specimens. Each specimen was labelled with the unique respondent identifying number. Both unique identifying number and respondent's name were recorded on a laboratory report form, however, on two different parts to be separated later. Unedited English translations of the informed consent form and the laboratory report form are provided in Appendices 7 and 8. All specimens were transported in cold boxes to interviewers' homes where they were immediately frozen and stored at -20^0C in small freezers provided for this purpose.

3.2.5. Transport of urine specimens and data from the field and supervision

Frozen urine specimens were collected from interviewers' homes once every two weeks. They were transported to the laboratory in cold boxes. Signed informed consent forms for urine specimen contribution, laboratory forms, completed questionnaires, reports on visits, forms giving temporary addresses or new permanent addresses to be reallocated to interviewers working in relevant areas, and reports on number of completed interviews, collected urine specimens and mileage were collected at the same time. This greatly reduced mailing expenses in comparison to the feasibility study. These regular visits of the principal investigator or another member of the research team enabled close monitoring of the field work progress and addressing any interviewers' queries in a timely manner.

3.2.6. Quality control of interviewers' fieldwork procedures

Interviewers had to follow complex instructions for interviewing and for obtaining urine specimens. During the training workshops we announced that telephone interviews would be conducted on a proportion of selected individuals to detect any departures from the required procedures. This had two objectives. We hoped that it would contribute to more stringent following of our instructions in the field, and more importantly, we wanted evidence that fieldwork was conducted according to instructions.

Our greatest concern was to motivate interviewers to do their best to obtain urine specimens from respondents and to prevent any cheating. To overcome the initial reluctance to collect urine specimens among interviewers, the great majority of whom were not health care workers, we generously reimbursed them for each obtained urine specimen in addition to reimbursement for completed interviews. It was therefore important to confirm that interviewers were not submitting their own urine in order to obtain reimbursement. Our second greatest concern was to prevent as many mistakes as possible in self administered questionnaires by ensuring that respondents were given clear instructions. We also wanted to be sure that respondents did receive invitation letters before visits of interviewers, that they were appropriately informed about the study aims and interviewing procedures, that interviews were conducted professionally and that participants did receive tee shirts.

At the end of interviews, respondents were informed that a proportion of them would be called for a short telephone interview to detect any departures from required fieldwork procedures. More than 90% of respondents provided their telephone numbers, which were recorded exclusively on visits record forms that contained information on their identities.

We planned several small computer assisted telephone interviewing (CATI) surveys to be conducted every month in parallel to the field interviewing. Partial data sets with information on visits to selected individuals' addresses (working SAMPLE database) were sent regularly from the IPHRS to CATI Centre. This working SAMPLE database was regularly updated at the IPHRS with the information from the reports of visits to selected individuals' addresses collected from the field. However, due to logistical problems in the CATI Centre, only two CATI survey waves were conducted, the first one in February 2000 and the second one in June 2000. Thus, we were only able to give some immediate feed back about their quality of work to the interviewers in the first wave of field interviewing.

Altogether 513 computer assisted telephone interviews were conducted enrolling approximately 30% of all survey respondents. Of these, 504 individuals (98%) confirmed they had been interviewed. The remaining nine individuals did not confirm that they participated in the survey. However, several of these nine records also had either inappropriate age or 98 code entered for age during telephone interviews, indicating a possibility that a wrong household member was talked to or that individuals were uncooperative or that telephone interviews were interrupted. The remaining discrepancies could have easily arisen from data entry mistakes in the working SAMPLE database at that early stage of single data entry or possible entry mistakes during computer assisted telephone interviewing. Nevertheless, the results of the quality control of fieldwork procedures were thoroughly assessed for all seven interviewers for whom a suspicion was raised that they submitted a completed questionnaire without the interview being conducted. Information from all other telephone interviews conducted with the main survey respondents of these seven interviewers (14 telephone interviews on average, ranging from six to 29) indicated that the interviewers involved did follow our instructions during fieldwork.

Due to delays in the data entry of laboratory testing results, the working SAMPLE database at the time when telephone interviews were conducted only contained information that 281 individuals contributed urine specimens. Of these, 280 (almost 100%) confirmed that during the telephone interview. Of the 47 individuals for whom the early SAMPLE database information indicated that they did not contribute urine specimens, during the telephone interview two (4%) claimed that they did. These minor discrepancies very likely resulted from the early single data entry mistakes in the working SAMPLE database or data entry mistakes during the computer assisted telephone interviewing. Not a single individual reported having contributed a urine specimen without having signed the informed consent form.

Of 487 respondents who reported that they completed anonymous self administered questionnaires, 99% reported that they did receive detailed instructions and 83% reported to have been told in advance that, if they needed any additional explanation, it would be provided using hypothetical examples and empty questionnaires, so that interviewers would not see their answers. Only three individuals claimed that they did not seal the self administered questionnaires into marked envelopes themselves or that the envelopes were not sealed in their presence. This could indicate a breach in maintaining anonymity. However, the information from all other telephone interviews conducted with respondents interviewed by two of the interviewers involved (nine and 18 telephone interviews) indicated no breach of anonymity. The third implicated interviewer conducted only 10 field interviews before her remaining selected individuals' addresses were reallocated to another interviewer. Of these, seven respondents were included in the telephone survey and five reported having completed anonymous booklets. Two

of those claimed that the envelopes were sealed in their presence, two that they did not remember and only one claimed that it was not sealed before being taken away.

A total of 40% of respondents reported that they remembered receiving the invitation letter to participate in the survey before the interviewers' visits, 91% reported that they had read the information leaflet about the study. Of the 21 who stated they had not read the leaflet, only two individuals claimed that the interviewer did not offer it. In fact, some respondents refused to read the whole leaflet. Six respondents claimed that they did not receive tee shirts. However, the information from all other telephone interviews conducted with respondents of the six interviewers involved (average number of other telephone interviews per implicated interviewer was 18, ranging from nine to 29) indicated that they always give tee shirts to respondents.

Overall, we were pleased that there was no evidence of cheating in the collection of urine specimens, that respondents were provided with detailed instructions on how to complete anonymous booklets, and that there was no evidence of any other major deficiencies in the interviewers' fieldwork procedures.

3.3. Laboratory testing for *Chlamydia trachomatis*

AMPLICOR PCR tests for *Chlamydia trachomatis* were performed on thawed FVU specimens according to producer's instructions.[165] The AMPLICOR internal control detection was used according to producer's instructions to identify inhibitory specimens and assure the integrity of negative results.[166-168] To contain cost testing was conducted in pool sizes of 5.[175,177] Specimens from reactive pools were retested individually.

After recording the test result on both parts of the laboratory report form, the two parts, one with the unique identifying number and the other with the name of the respondent, were cut in two. The parts with unique identifying numbers were sent to CATI Centre to be anonymously linked with demographic, behavioural and attitudinal information reported by respondents. The parts with respondents' identifying information were sent to the Institute of Public Health to enable confidential notification of infected respondents and analysis of participation in urine specimen contribution.

3.4. Notification of infected individuals

Individuals diagnosed with *Chlamydia trachomatis* infection were notified with a letter about the positive result. Men were referred for treatment to their general practitioner and women were advised to choose between going to the general practitioner or gynaecologist. In addition to the details about the test results, the letters also included recommendations for treatment, some information about the survey and suggestion that contacts should be notified and treated, which was partly intended to guide the physicians. In addition, free case management according to the recommendations of the Centres for Diseases Control and Prevention[108] that included counselling and contact notification was offered at the Central Dermato-venerological outpatient clinic in Ljubljana, in case this was preferred.

3.5. Data management

After coding of occupation at the Statistical Office of the Republic of Slovenia, completed interviewer-administered questionnaires together with sealed self-administered questionnaires were transported to the CATI Centre. Questionnaires were checked for errors, missing information and internal inconsistencies. Whenever clearly correct information was reported elsewhere in the questionnaires, corrections were made. Whenever obvious mistakes or inconsistencies were identified and other reliable information was not available, the inconsistency-missing codes were assigned (e.g. 996). The numbers of changes were recorded. If any doubt was raised about the validity of a reported information item in a particular questionnaire, it was noted. Missing codes were assigned (e.g. 999). If necessary, the questionnaires were referred to the supervisor. To ensure that there were no major flaws in the process of preparing the data for entry, the principal investigator checked approximately 20% of questionnaires selected randomly. All data were double entered in data entry package Auto-CATI, developed at CATI Centre. Code range, filter, logic and internal consistency checks were built in. Discrepancies due to entry mistakes were checked against the questionnaires and corrected. Anonymous results of urine specimen tests were entered last. Three databases were prepared: IAQ database, with information from interviewer-administered questionnaires, and MALE SAQ and FEMALE SAQ databases, with information from self-administered questionnaires. Records in all three have unique identifiers to enable linking information obtained from individual respondents.

Completed forms about outcomes of visits to selected individuals' addresses and *Chlamydia trachomatis* testing laboratory forms, were checked for errors, missing information and internal

inconsistencies at the IPHRS. If information was missing or if it seemed inaccurate, interviewers or laboratory personnel were consulted. The data were double entered using EPI INFO 6 statistical package. Discrepancies due to entry mistakes were checked against the completed forms and corrected. This SAMPLE database includes information on identity and basic demography for respondents and non-respondents, but not unique identifiers used in IAQ and SAQ databases.

All four data sets were examined for consistency in the numbers of interviews conducted, completed self-administered questionnaires, collected urine specimens and reported positive and negative results for *Chlamydia trachomatis* testing among men and women. For eight out of 1752 individuals the information on whether self administered questionnaires were completed or not in the IAQ database was inconsistent with the presence of a record in SAQ databases. These discrepancies, which were due to mistakes in recording outcomes of interviews in the IAQ database were resolved. Distributions of gender, age, community size, and region for respondents in the SAMPLE database were compared to distributions for individuals in the IAQ database. All discrepancies for age and gender were examined and resolved. Finally, responses to several questions asked during the face to face interview were compared to responses to similar questions provided anonymously by completing the self-administered questionnaire. For example, information on more than one heterosexual partner ever reported during the face-to-face interview was compared to anonymously reported number of heterosexual partners in one of the self-administered questionnaires.

Distributions of variables in all four databases were examined to detect unlikely distributions and values falling outside the expected range. Proportions of missing values were noted. Numerous internal consistency checks were conducted by examining joint distributions of pairs of variables within databases. For example, reported information on when respondent had last heterosexual intercourse, if ever, was compared to the number of reported heterosexual partners lifetime. Or, reported numbers of partners were cross-tabulated for different time periods to check whether, as expected, they remain equal or increase with time. Possible errors were checked against original records and corrected. SAMPLE database was checked and edited using EPI INFO 6 and the others using SPSS 10.

3.6. Weighting the sample data

Two different weights were computed at the Statistical Office of the Republic of Slovenia. For the calculation of the first weight the respondent was assumed to be any individual who concluded the interview. For the calculation of the second weight, the respondent was assumed to be an individual who in addition to being interviewed also contributed a urine specimen. Both weights adjust for oversampling young people, differences in response between different types and sizes of communities and for any differences according to known population characteristics by statistical regions, type and size of communities, gender and age groups, based on the Central Population Registry data for the year 2000.

The survey data were first weighted because of unequal probability of selection of individuals according to two broad age groups. Individuals 18 to 24 years old, who were selected with twice the probability in comparison to older individuals, were assigned a weight equal to 0.5. Individuals 25 to 49 years old were assigned a weight equal to 1.

Hence,

$$w_{individual} = \frac{1}{p_{individual}},$$

where:

$P_{indivdual}$ is a probability of selection.

This provided for a self weighting (balanced) sample.

To adjust for differences in the response between different regions as well as types and sizes of communities, the data were weighted further. The assumption was that non-respondents behave in a way that is closer to the average respondent within these implicit strata, than to the average of the whole sample.

$$w^{nonr}_{type\_settlm} = \frac{eligible_{type\_settlm}}{response_{type\_settlm}},$$

where:

$eligible_{type\_settlm}$ is the number of eligible individuals and

$response_{type\_settlm}$ is the number of respondents

Then, weights were calculated as a product of these two.

$$w = w_{individual} \cdot w^{nonr}_{type\_settlm} \,,$$

Finally, a "multidimensional raking or calibration procedure"[186] was applied to adjust for any differences between the achieved sample and available Slovenian population estimates according to statistical regions (12), type and sizes of communities (six) and gender-age groups (14), the four available auxiliary variables. Thus, it was ensured that estimators of known totals, such as the totals of auxiliary variables, give the known total. For example, if the proportion of males in the population is 51%, then the calibrated estimate of the proportion of males would give the value 51%. The assumption was that non-respondents behave in a way that is closer to the average respondent within these "region, community type/size, gender and age poststratification strata" than to the average of the whole sample. The weights were scaled to sum to the actual sample size (number of respondents), so that the average weight is 1.0. The calibration was applied using software for calibration Calmar, which was developed at INSEE in France.

3.7. Variables used in analyses and wording of questions

Of the many questions asked during the face to face interview (Appendix 3) and in the self-administered questionnaires (Appendix 5), only variables that were used in analyses for the results presented in the thesis and the wording of some important questions are referred to in this chapter.

All participants were asked about some of their demographic and social characteristics face-to-face. This information included: respondents' year of birth and age at interview, attained educational level, structure of family of origin until the age of 15 (whether they were brought up by both biological parents), religious affiliation, and marital status. Information about the community size and type was already available from the Central Population Register for all individuals selected into the probability sample. All participants were asked about their sources of information about sexual matters and which was the single most important source. Everyone was also asked whether they felt they knew enough about sexual matters at the time of their first heterosexual intercourse or at the time of the interview for those who had not yet had this experience. Respondents who felt that they did not know enough were asked what would be their most desired knowledge source. Women were asked about the age at menarche.

Questions about the age at first heterosexual experience and the age at first heterosexual intercourse were also asked face-to-face to all respondents. They were handed show-cards with the following wording: "How old were you when you first had sexual intercourse with a woman (man for female respondents) or hasn't this ever happened?" and "How old were you when you first had any type of experience of a sexual kind – for example, kissing, cuddling, petting – with a woman (a man for female respondents) or hasn't this ever happened?". Men and women who reported their age at first heterosexual intercourse were asked about the event in more detail.

All respondents were asked about heterosexual and homosexual attraction and experience during the face to face interview. Men were handed show-cards with the following wording:

I have felt sexually attracted ...

- only to female(s), never to male(s) (K)
- more often to female(s), and at least once to a male (C)
- about equally often to female(s) and male(s) (F)
- more often to male(s), and at least once to a female (L)
- only ever to male(s), never to female(s) (D)

I have never felt sexually attracted to anyone at all (N)

Sexual experience is any kind of contact with another person that you felt as sexual (it could be just kissing or touching, or intercourse, or any other form of sex).

I have had some sexual experience:

- only with females (or a female), never with a male (R)
- more often with female(s), and at least once with a male (Š)
- about equally often with female(s) and with male(s) (T)
- more often with male(s), and at least once with a female (O)
- only with males (or a male), never with a female (Z)

I have never had any sexual experience with anyone at all (H)

Women were handed a corresponding version of these show cards. Respondents could give their answers in letter codes.

3.7.1. First heterosexual intercourse

Questions about the first heterosexual intercourse included questions on age of the first partner and whether it was also the first time for the partner, whether they themselves or their partner

was more willing, or whether they were both equally willing, and on their thoughts about the timing of the event. Respondents were also asked about the nature of the relationship, about the main triggering contextual factors for the first heterosexual intercourse and whether it was anticipated or planed. They were asked whether condom or any other contraceptive method was used.

3.7.1. Sexual partnerships, practices, and HIV risk behaviours

All other questions about respondents' sexual lifestyles, different sexual practices, and about behaviours with higher risk for HIV infection were asked in the four self-administered questionnaires (Appendix 5).

Respondents were asked about the total numbers of opposite-sex partners as well as same-sex partners for different time periods (past month, past year, past five years, and lifetime), whether they had any new opposite-sex or same-sex partners during the past year, and if so, how many. They were asked with how many of these partners they always used condoms (except for the same-sex partners reported by women), and whether they ever, in the past five years or in the past year engaged in two sexual relationships at the same time (concurrency). Wording for the latter two questions for male respondents for the period of past 12 months was as follows: "In the past 12 months, with how many different women have you had sexual intercourse so that condom was always used (at every intercourse)?" and "Have you had, in the past 12 months, sexual intercourse with a woman while you were in a relationship with another woman?" Women were asked a corresponding female version of these questions. Everyone was also asked about the number of occasions of heterosexual intercourse as well as homosexual sex with partners who were not Slovenian. If at least one such occasion or one such partner was reported, respondents were asked about when the most recent such event or partnership occurred, whether this was in Slovenia or somewhere else, if somewhere else, where, and what kind of a partner was the only or most recent one (paid - male respondents only, casual, steady, cohabiting or spouse). Only men were asked whether they ever paid a woman or a man for sex. If they reported that they had, they were also asked on how many occasions they paid for sex and to how many partners, when was the last occasion, and how many of these paid partners were not Slovenian and paid while travelling or living abroad. At the very end of the last self administered questionnaire, respondents were asked whether they had ever received payment for sexual intercourse themselves.

Questions about homosexual experiences in the self administered questionnaires were introduced with the following wording for male respondents: "Have you ever had any kind of sexual experience or sexual contact (e.g. kissing or cuddling) with a male? Please tick “yes”, even if it was a long time ago and did not involve contact with the genital area or penis." Men who responded "yes" were referred to additional questions: "Have you ever had sexual contact with a man involving genital area or penis contact (male sex organ)?" They were also asked when was the last time they experienced specific homosexual practices (penetrative and non-penetrative), if ever. Female participants were asked a corresponding female version of these questions.

Definitions for different sexual practices (penetrative and non-penetrative), vaginal intercourse, oral sex, anal intercourse, and genital contact without penetration, were given at the beginning of the first self administered questionnaire. Respondents were asked when it was the last time, if ever, that they experienced each of these practices. Fellatio and cunnilingus were asked about separately. Only women were asked when, if ever, was the last occasion that they were forced into heterosexual intercourse. Respondents were also asked about the frequency of heterosexual intercourse occasions during the past month.

At the beginning of the third self administered questionnaire respondents were first asked whether they had any sexual partners during the past five years. If they reported at least one, they were asked about their current partnership status (no partner currently, steady opposite-sex or same-sex partner (but not in cohabitation), cohabiting opposite-sex or same-sex partner, married). Detailed questions about the only partnership or up to at most three most recent partnerships (whenever more than three partners were reported for the past five years) followed. These questions also included questions about the respondents' awareness of any of these partners having ever injected illicit drugs, during or before the relationship with the respondent.

Respondents were also asked whether they themselves ever injected illicit drugs such as heroine or cocaine. If so, they were asked when last, and whether they ever shared injecting equipment.

3.8. Data analysis methods

Descriptive analyses of the survey response, reasons for non-response, and participation in FVU specimen collection were conducted using EPI INFO 6 statistical software. Analyses of response to individual questions were conducted using SPSS statistical software (Release 10). All other analyses were conducted using STATA statistical software (Release 7.0). With a few exceptions (e.g. Kaplan Meier analysis described below) statistical methods for complex survey data (svy commands) were used.[187] Thus, the stratified two-stage clustered sampling strategy was taken into account and weighting was incorporated. All results (except for survey response, reasons for non-response, and participation in FVU specimen collection) are presented using weighted data. The weighted bases for percentages, which are quoted in tables are rounded to the nearest integer. Thus, due to rounding-up errors, summing-up does not always give the total figure quoted. Only weighted estimates for the numbers of individuals are given in all tables with results on weighted data (bases). The svy commands use t-statistics with n – L degrees of freedom for testing the significance of coefficients, where n is the total number of sampled primary sampling units and L is the number of strata, produce adjusted Wald tests for the model test, and svytest can be used to produce adjusted Wald tests for other hypotheses.[187]

3.8.1. Strategy of analyses

All analyses were performed separately for men and women. Distributions of all variables together with the proportions of missing values were examined and different data reduction strategies were considered. Year of birth was grouped to give birth cohorts with three categories for most analyses, 1975-1982, 1965-1974, and 1950-1964, which almost perfectly corresponded with the three age groups at interview, 18-24, 25-34, and 35-49 years old. The agreement was 100%, 98.3%, and 98.3% respectively. A few results are also presented according to the more detailed distribution of birth cohort or age at interview. The agreement between being born during 1980-1982, 1975-1979, 1970-1974, 1965-1969, 1960-1964, 1955-1959, and 1950-1954 and respective age groups at interview 18-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49 was 99.4%, 94.9%, 97,2%, 96.0%, 96.9%, 96.3%, and 96.8% respectively. Small disagreements were probably the consequence of a rather long field work period and not due to discrepancies between birth year and current age reported.

The prevalence of numerous behaviour patterns was estimated, and many behaviour patterns were also treated as outcome variables of interest in a series of univariate and multivariate analyses of association (e.g. non-use of contraception at first heterosexual intercourse or at least 10 lifetime heterosexual partners). In general, the strategy of analysis was the same irrespective

of which associations between outcome and selected explanatory variables were explored. Age at first heterosexual intercourse was one of the outcome variables of interest, which was also treated as an explanatory variable in some other analyses (e.g. when exploring the association of first heterosexual intercourse before the age of 16 with use of condom at the event). Decisions on which associations for particular outcome variables of interest with which possible explanatory variables to explore, were based on research questions identified as important for understanding the epidemiology of HIV and other STI in Slovenia (e.g. exploration of protective effect of school as a source of information on sexual matters with early heterosexual intercourse) and on information about which variables were identified as risk or protective factors by other researchers (e.g. religious affiliation as a protective factor for early heterosexual intercourse).

3.8.2. Descriptive analyses

Weighted proportion estimates with 95% confidence intervals (95%CI or CI_{95}) were computed for different behavioural patterns of interest, separately for men and women, and most often also for different sub-populations, including specific age groups or birth cohorts (e.g. proportions of men and women from different birth cohorts with at least one foreign heterosexual partner ever). Tests for heterogeneity of proportions, for example, according to different birth cohorts, were computed by using the usual Pearson chi-squared test, however, based on F statistics with noninteger degrees of freedom using a second order Rao and Scott correction accounting for the survey design.[187,188] In addition they were also computed by using logistic regression with the birth cohort fitted as a factor. Only when the proportions increased or decreased systematically, tests for trend in proportions were computed using logistic regression and fitting birth cohort linearly (categories coded as 1, 2, and 3).

3.8.3. Univariate analyses

Univariate analyses of association between outcome variables and selected explanatory variables were first performed by two way tables analysis for complex survey data, separately for men and women, using all available data. These gave the results of tests of significance using the usual Pearson chi-squared test, however, based on F statistics with noninteger degrees of freedom using a second order Rao and Scott correction accounting for the survey design[188]. Univariate analyses were then repeated using logistic regression for survey data to obtain pseudo-maximum likelihood estimates of odds ratios[187] together with 95% CI, and results of adjusted Wald tests for significance[189] using all available data. When the results of univariate

analyses are shown in the same tables as the results of multivariate analyses, only records with complete data for all variables in the final multivariate logistic regression models were used.

3.8.4. Multivariate analyses

Multivariate analyses were used to obtain estimates of the effects of selected explanatory variables on specific outcomes, adjusted for the effects of other explanatory variables. Variables were included in a series of logistic regression multivariate models if: i) they were associated with the outcome at the significance level of $p<0.1$ in univariate analyses or ii) they were identified *a priori* as explanatory variables of interest or confounders (i.e. birth cohort or age) or iii) they were statistically significantly associated with the outcome in the equivalent multivariate model for the other gender. Variables that remained statistically significant ($p<0.05$) in the multivariate analyses for either gender, were retained in the final models for both men and women. Records with missing data for any variables in the final multivariate logistic regression models were excluded from the final models (complete-subject analysis).[190,191] Pseudo-maximum likelihood adjusted odds ratios[187] with 95% CI for all variables left in the final models and the results of adjusted Wald F tests for significance were computed (svytest command).[187,189]

The correlation coefficient matrix was computed for all variables included in the final multivariate models to assess whether any pair of variables were highly correlated and could cause multicollinearity problems[192]. Potential problems of multicollinearity were anticipated in two multivariate logistic regression models that explored associations of at least two partners last year and at least 10 partners lifetime with different explanatory variables. Marital status and partnership status at the interview were highly correlated (correlation coefficient was 0.90 for men and women). It was decided to drop the marital status from the final models and to retain partnership status, as the latter was more informative.[192]

Birth cohort (age at interview) was always treated either as one of the explanatory variables of interest or as a priori confounder. It was fitted as a categorical variable in all logistic regression models, with the exception of models exploring the association of different risk or protective factors with non-use of contraception and condom use at first heterosexual intercourse. For these models, birth cohort in calendar years (age at interview in years) and another time variable, calendar period at first heterosexual intercourse (in years), were both treated as continuous variables. This increased the power to differentiate between their effects. For example, two subjects born in the same calendar year having first heterosexual intercourse a few years apart (therefore at different ages) would both be in the same five year birth cohort group

and could also be in the same five years first heterosexual intercourse period group. Thus, it would be very difficult to distinguish between their effects, as for a given category of birth cohort there would be little variability in the period at the event, if both variables were grouped in five year categories. Also, very high correlation between the two variables after such data reduction strategy could result in potential multicollinearity problems.[192]

3.8.5. Kaplan Meier survival analysis for the age at first heterosexual intercourse

Weighted median rather than mean ages for the first heterosexual intercourse were computed based on information for all participants. This was because the mean can be artificially low, since it is based on reports from those who already had sexual intercourse. Also, reported intercourse, for example, at the age of 15, could have occurred at any time during the 12 month period after the 15th birthday. Thus, a valid estimate of the mean can not be computed without more precise information. All individuals who had not yet experienced first heterosexual intercourse at the time of the interview were included in analyses (coded 96), as eventually almost everyone experiences it. Four individuals who reported first heterosexual intercourse before first heterosexual experience were excluded from analyses. Weighted estimates of the cumulative proportions of respondents having experienced first heterosexual intercourse by each age (in years) were obtained by Kaplan Meier survival analysis with censoring of individuals who had not yet experienced it.[193] Logrank tests (Log RT) for the equality of the survival functions were used to test for the differences between men and women, and different birth cohorts among all and separately among men and women.[194] Underlining use of these methods was the assumption that the distribution of age at first heterosexual intercourse for those not having experienced it by the time of the survey, thus censored, would be the same as for those who were older at the time of the survey and had already experienced it. Bias resulting from invalidity of such an assumption was assumed to be negligible when looking at the age at first heterosexual intercourse within earlier birth cohorts. However, recent cohorts appeared to have first heterosexual intercourse at a slightly younger age, which may have resulted in slightly biased estimates of Kaplan Meier survival functions when considering most recent cohorts or all respondents together. Maximum possible bias was estimated by assuming that everybody who had not experienced first heterosexual intercourse by the time of the survey would have experienced it at the age at survey (before their next birthday). Additional analyses were done to assess differences in cumulative proportions of respondents already having had experienced first heterosexual intercourse before the age of 17 between men and women and between different cohorts of men and women. This was done by restricting analyses to the parts of the Kaplan Meier survival curves under the age of 17. As only individuals aged 18 or more were eligible,

no assumptions were needed about the distribution of age at first heterosexual intercourse for those experiencing the event after the age at survey with this restricted analysis approach.

4. Response and survey sample characteristics

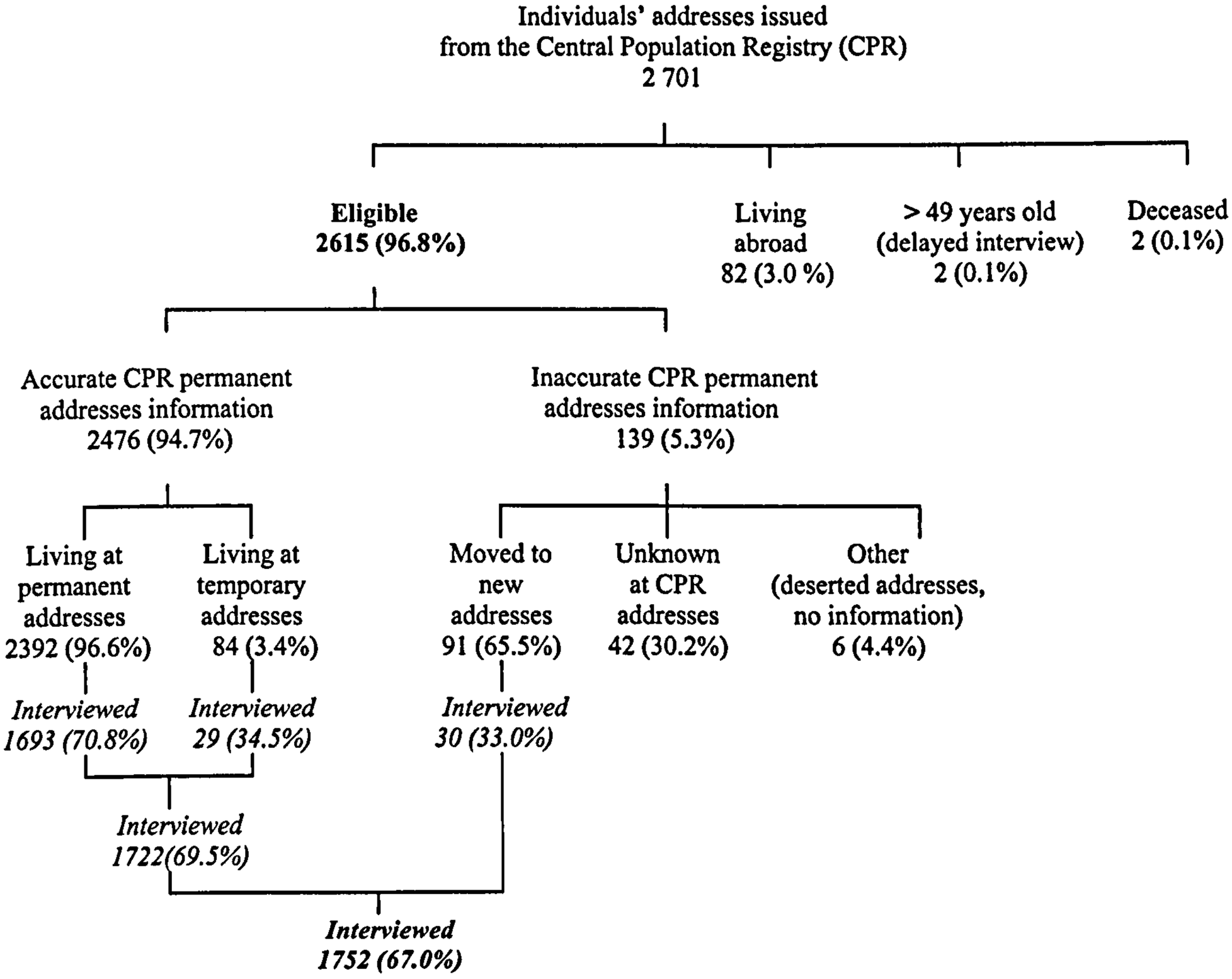
4.1. Survey response and participation in urine specimen collection

Interviewers received a list of 2701 Slovenian citizens to be interviewed, with information on names, surnames, gender, age, permanent addresses and sizes and type of communities. Of these, interviewers found 86 (3.2%) individuals ineligible, because they had died recently, lived abroad or reached an age above 49 years before the contact was made (Figure 4.1.).

Excluding these 86 ineligible subjects, 2615 individuals were confirmed eligible or, if never contacted, presumed eligible and constitute the denominator for the overall response rate. For 2476 (94.7%) of these, the information about permanent addresses from the Central Population Registry (CPR) was confirmed as accurate. Of the remaining 139 individuals, 91 had moved, 42 were not known at the address, and for 6 the addresses were deserted or information was missing. If new addresses were obtained for those who moved, contact was sought. If necessary, new addresses were reallocated to interviewers working nearest. Thus, 30 interviews were conducted at new addresses, resulting in 33.0% response among those who moved. Of 2476 individuals with accurate CPR addresses, 2392 (96.6%) were found to live at these addresses permanently. Of these, 1693 were interviewed, which resulted in 70.8% response. A further 84 individuals were reported to live at temporary addresses. If these were obtained, contact was sought. If necessary, temporary addresses were reallocated to interviewers working nearest. Thus, 29 individuals were interviewed, 34.5% response in this group. Overall, 1722 interviews were conducted among 2476 individuals with accurate address information in the CPR, a 69.5% response. Taking into account all 1752 interviews conducted among 2615 individuals, with either confirmed or presumed eligibility, the overall response rate was 67.0%.

Women were more likely to participate in the survey, 70.9% response in comparison to 63.3% among men ($p<0.001$) (Table 4.1.). For both genders, the response decreased with age, among men from 71.3% in 18 to 19 year olds to 58.9% in 45 to 49 year olds, and among women from 77.8% to 65.4% respectively. Individuals living in the two Slovenian cities with more than 100 000 inhabitants, Ljubljana and Maribor, were less likely to participate in the survey than those from smaller communities. The response was extremely low (33.8%) among men in Maribor. There were some differences in the response by geographical regions; the outstandingly high response in the Zasavska region probably reflects the good doorstep approach skills of the interviewer working there and not some genuine enthusiasm of inhabitants of this region to participate in surveys.

Figure 4.1: Overall response among eligible individuals according to residence status



Of 1752 interviews conducted, five were interrupted at different stages. However, at least basic demographic information and, if applicable, information on first heterosexual intercourse was reported.

Overall 1449 survey respondents (82.7% of all), 685 men and 764 women were tested confidentially for infection with *Chlamydia trachomatis*, 80.7% of male and 84.6% of female respondents. Considering all eligible individuals, FVU specimens were collected from 51.1% of men and a higher proportion of women, 60.0% ($p<0.001$) (Table 4.1.). The differences in urine specimen collection in different age groups were not significant, but those under 35 years old contributed urine specimens slightly more frequently than those 35 years old or older (among men 53.6% versus 47.6% and among women 62.8% versus 56.1%). The urine participation rate was extremely low among men from the two biggest cities, Ljubljana and Maribor, (46.9% and 27.9%). There were some differences among geographical regions, with high urine specimen

collection rate in the Zasavska region, again probably reflecting the skills of the particular interviewer.

Table 4.1. Survey response rates and participation rates in urine specimen collection for men and women according to age group, community size, and region

	Males					Females				
	Eligible	Interviews conducted		Urine specimens collected		Eligible	Interviews conducted		Urine specimens collected	
	n	n	(% eligible)	n	(% eligible)	n	n	(% eligible)	n	(% eligible)
Age										
18-19	136	97	(71.3%)	75	(55.1%)	108	84	(77.8%)	65	(60.2%)
20-24	336	228	(67.9%)	179	(53.3%)	321	237	(73.8%)	200	(62.3%)
25-29	161	106	(65.8%)	90	(55.9%)	151	109	(72.2%)	97	(64.2%)
30-34	151	91	(60.3%)	76	(50.3%)	159	110	(69.2%)	102	(64.2%)
35-39	166	94	(56.6%)	74	(44.6%)	191	132	(69.1%)	104	(54.5%)
40-44	194	117	(60.3%)	94	(48.5%)	188	129	(68.6%)	109	(58.0%)
45-49	197	116	(58.9%)	97	(49.2%)	156	102	(65.4%)	87	(55.8%)
Test for trend		$p_t < 0.01$		$p_t = 0.06$			$p_t = 0.01$		$p_t = 0.09$	
Community size										
< 2 000 rural	409	280	(68.5%)	235	(57.5%)	347	247	(71.2%)	214	(61.7%)
< 2 000 urban	342	232	(67.8%)	169	(49.4%)	288	217	(75.3%)	175	(60.8%)
2 000 – 10 000	187	112	(59.9%)	96	(51.3%)	206	149	(72.3%)	124	(60.2%)
10 000 – 100 000	173	115	(66.5%)	90	(52.0%)	203	145	(71.4%)	120	(59.1%)
> 100 000 Maribor	68	23	(33.8%)	19	(27.9%)	57	34	(59.6%)	29	(50.9%)
> 100 000 Ljubljana	162	87	(53.7%)	76	(46.9%)	173	111	(64.2%)	102	(59.0%)
Test for heterogeneity		$p < 0.01$		$p < 0.01$			$p = 0.07$		$p = 0.76$	
Regions (statistical)										
Pomurska	90	52	(57.8%)	34	(37.8%)	83	52	(62.7%)	40	(48.2%)
Podravska	221	124	(56.1%)	99	(44.8%)	195	136	(69.7%)	110	(56.4%)
Koroska	56	35	(62.5%)	32	(57.1%)	38	25	(65.8%)	24	(63.2%)
Savinjska	170	110	(64.7%)	75	(44.1%)	168	125	(74.4%)	93	(55.4%)
Zasavska	26	22	(84.6%)	21	(80.8%)	33	32	(97.0%)	30	(90.9%)
Spodnje-posavska	51	39	(76.5%)	30	(58.8%)	35	27	(77.1%)	24	(68.6%)
Dolenjska	70	56	(80.0%)	44	(62.9%)	72	49	(68.1%)	41	(56.9%)
Osrednje-slovenska	337	207	(61.4%)	181	(53.7%)	341	228	(66.9%)	203	(59.5%)
Gorenjska	131	82	(62.6%)	71	(54.2%)	137	103	(75.2%)	92	(67.2%)
Notranjsko-kraska	39	34	(87.2%)	25	(64.1%)	28	18	(64.3%)	17	(60.7%)
Goriska	78	41	(52.6%)	35	(44.9%)	77	61	(79.2%)	48	(62.3%)
Obalno-kraska	72	47	(65.3%)	38	(52.8%)	67	47	(70.1%)	42	(62.7%)
Test for heterogeneity		$p < 0.01$		$p < 0.01$			$p = 0.02$		$p < 0.01$	
All	1341	849	(63.3%)	685	(51.1%)	1274	903	(70.9%)	764	(60.0%)

4.2. Reasons for survey non-response

Of all eligible, 17.8% men and 17.9% women explicitly refused to participate in the survey (Table 4.2.). Among both men and women, direct refusal was more common among older than younger. It was also relatively high among men living in the two biggest cities. Many of the 3.0% men and 2.0% women, who proved impossible to contact again after not being interviewed during the initial or previous contact, probably refused indirectly. A low proportion of eligible individuals, 0.9% men and 0.8% women were unable to participate for different

reasons, including illness or not being able to understand the Slovene language very well. No contact was made with 6.4% men and 3.1% women after at least five calls. The remaining 8.4% men and 5.4% women were not interviewed for other different reasons including being away during the fieldwork, having moved and not being traced to new addresses, and not being known at the addresses obtained from the CPR.

Table 4.2. Response and non-response for men and women according to age group and community size

	Age group			Community size (in thousands)			
	18-24	25-34	35-49	<2	2 – 100	>100	Total
Men (all eligible - 100% base)	472	312	557	751	360	230	1341
Interviews conducted	68.9%	63.1%	58.7%	68.2%	63.1%	47.8%	63.3%
Interviews not conducted	31.1%	36.9%	41.3%	31.8%	36.9%	52.2%	36.7%
Direct refusal	12.3%	16.3%	23.3%	17.6%	15.6%	22.2%	17.8%
Proxy refusal (no further contact)	3.8%	1.9%	2.9%	2.4%	1.9%	6.5%	3.0%
Incapable (sick, language problems)	0.6%	0.3%	1.4%	0.8%	1.1%	0.9%	0.9%
No contact after 5+ calls	6.6%	7.1%	5.9%	6.1%	7.2%	6.1%	6.4%
Away during field work	4.0%	3.9%	3.2%	3.2%	3.9%	4.7%	3.6%
Moved and not traced	1.7%	4.5%	2.3%	0.8%	4.2%	6.1%	2.6%
Not known at the address	1.7%	1.6%	1.6%	0.5%	1.9%	4.8%	1.6%
Other	0.4%	0.6%	0.6%	0.3%	0.9%	0.8%	0.5%
Missing information	0.0%	0.6%	0.0%	0.1%	0.3%	0.0%	0.1%
Women (all eligible - 100% base)	429	310	535	635	409	230	1274
Interviews conducted	74.8%	70.6%	67.9%	73.1%	71.9%	63.0%	70.9%
Interviews not conducted	25.2%	29.4%	32.1%	26.9%	28.1%	37.0%	29.1%
Direct refusal	11.9%	19.7%	21.7%	18.7%	16.6%	17.8%	17.9%
Proxy refusal (no further contact)	1.9%	2.3%	1.9%	1.3%	1.5%	4.8%	2.0%
Incapable (sick, language problems)	0.9%	0.6%	0.7%	0.8%	0.7%	0.9%	0.8%
No contact after 5+ calls	4.0%	1.6%	3.4%	2.2%	5.1%	2.2%	3.1%
Away during field work	2.5%	1.9%	1.3%	2.1%	0.9%	3.0%	1.9%
Moved and not traced	2.1%	1.3%	1.1%	0.9%	1.2%	3.5%	1.5%
Not known at the address	1.2%	1.9%	1.7%	0.6%	1.5%	4.3%	1.6%
Other	0.7%	0.0%	0.2%	0.4%	0.5%	0.0%	0.3%
Missing information	0.0%	0.0%	0.2%	0.0%	0.0%	0.4%	0.1%

a – no further contact was made with the respondent after initial contact during which interview was not conducted

4.3. Demographic representativeness of the sample

Table 4.3. presents the distribution of several demographic and social characteristics in our survey sample, in the Central Population Registry data by mid 2000, in the national Fertility Survey - 1995/1996, and in the national Labour Force Survey – 2000 samples.

Table 4.3. Demographic representativeness of the sample

	SLAH[a] 1999/2000 unweighted	SLAH[a] 1999/2000 weighted (sampling weights)	SLAH[a] 1999/2000 weighted (post-stratification weights)	SLAH[a] 1999/2000 urine sp.[b] weighted (post-stratification weights)	CPR[c] 2000	NFS[d] 1995/1996 weighted (post-stratification weights	LFS[e] 2000 weighted (post-stratification weights)
Gender							
Males	48.5%	48.0%	50.5%	50.5%	50.5%	40.4%	51.2%
Females	51.5%	52.0%	49.5%	49.5%	49.5%	59.6%	48.8%
Age							
18-19	10.3%	6.3%	6.1%	6.1%	6.1%	7.6%	6.7%
20-24	26.5%	16.3%	15.6%	15.6%	15.6%	17.3%	15.6%
25-29	12.3%	15.1%	14.8%	14.8%	14.8%	18.4%	14.6%
30-34	11.5%	14.1%	15.2%	15.2%	15.2%	18.9%	15.2%
35-39	12.9%	15.8%	15.8%	15.8%	15.8%	19.3%	15.7%
40-44	14.0%	17.2%	16.0%	16.0%	16.0%	18.5%	14.5%
45-49	12.4%	15.3%	16.5%	16.5%	16.5%	-	17.7%
Marital status							
Married	43.9%	53.0%	52.9%	52.9%	-	57.7%	48.2%
Cohabiting	11.6%	12.0%	12.2%	13.0%	-	-	6.9%
Widowed/divorced/separated	2.2%	2.7%	2.9%	2.8%	-	3.3%	3.5%
Single	41.9%	31.9%	31.7%	31.3%	-	39.0%	41.4%
Missing	0.3%	0.4%	0.4%	0.0%	-	-	-
Education							
<1st stage secondary	15.2%	15.9%	15.8%	16.0%	-	28.9%	21.3%
1st stage secondary	25.1%	25.3%	25.3%	25.4%	-	29.7%	28.4%
2nd stage secondary	44.5%	41.4%	41.4%	42.4%	-	29.3%	36.9%
Recognised 3rd level	14.8%	17.0%	17.1%	16.0%	-	11.7%	13.5%
Missing	0.4%	0.5%	0.4%	0.1%	-	0.3%	-
Community size							
< 2 000	55.7%	55.4%	51.8%	51.8%	51.8%	49.8%	51.7%
2,000 – 10 000	14.9%	14.9%	16.5%	16.5%	16.5%	16.8%	16.2%
10 001 – 100 000	14.8%	14.8%	14.1%	14.1%	14.1%	14.6%	13.8%
> 100 000	14.6%	14.9%	17.7%	17.7%	17.7%	18.7%	18.3%
Statistical region							
Pomurska	5.9%	6.0%	6.5%	6.5%	6.5%	-	6.3%
Podravska	14.8%	15.1%	16.4%	16.4%	16.4%	-	16.1%
Koroska	3.4%	3.5%	3.8%	3.8%	3.8%	-	3.9%
Savinjska	13.4%	13.2%	13.1%	13.1%	13.1%	-	13.1%
Zasavska	3.1%	3.1%	2.3%	2.3%	2.3%	-	2.3%
Spodnje-posavska	3.8%	3.7%	3.5%	3.5%	3.5%	-	3.5%
Dolenjska	6.0%	5.9%	5.4%	5.4%	5.4%	-	5.3%
Osrednje-slovenska	24.8%	24.6%	25.7%	25.7%	25.7%	-	26.1%
Gorenjska	10.6%	10.6%	9.9%	9.9%	9.9%	-	9.8%
Notranjsko-kraska	3.0%	3.0%	2.5%	2.5%	2.5%	-	2.5%
Goriska	5.8%	5.8%	5.9%	5.9%	5.9%	-	6.0%
Obalno-kraska	5.4%	5.5%	5.2%	5.2%	5.2%	-	5.2%
Religious affiliation							
Roman Catholic	66.0%	66.3%	65.4%	65.7%	-	66.4%	-
Other religions	4.9%	4.9%	5.0%	5.0%	-	6.2%	-
None	29.0%	28.5%	29.3%	29.1%	-	27.2%	-
Missing	0.2%	0.3%	0.3%	0.3%	-	0.2%	-
Total number of persons included	1752 (100%)	1752 (100%)	1752 (100%)	1449 (100%)	962 377 (100%)	4559 (100%)	37 722 (100%)

a - Sexual Lifestyles, Attitudes and Health
b - sub-sample of respondents who contributed urine specimens
c - Central Population Register
d - Fertility Survey (weighted to adjust for differences in response and known population characteristics according to gender, age groups regions, and sizes of communities). For comparing age distributions only 18 to 44 years old were selected from the National Fertility Survey sample. Eligible ages for their survey were 16 to 45, however, some individuals older than 45 were interviewed and also included in ananlyses.
e - Labour Force Survey (weighted to adjust for differences in response and known population characteristics according to gender, age groups, regions, and sizes of communities)

Comparisons for the distributions of marital status, education and religious affiliation are somewhat constrained as formats used for these question were different. Also, the eligibility criteria for age in the Fertility Survey were different and the survey was conducted five years earlier. If we assume that Fertility Survey respondents in cohabitation, classified themselves more often as single and less often as married, and if we assume that Labour Force Survey respondents in cohabitation, consistently classified themselves as single, then the three survey populations marital status distributions seem roughly similar. The distributions of religious affiliation in our survey sample and in the Fertility survey are very similar.

4.4. Response to individual questions

Item response rate for questions asked during the face-to-face interview was, with a few exceptions, above 98% for questions asked to all. The information on year of birth, age and community type and size was available for all respondents. The item non-response was below 0.5% for other important demographic or social characteristics variables used in analyses (attained education level, religious affiliation, and marital status) for both men and women. The last question asked, about the willingness to participate in a similar survey in the future had the highest item non-response (4.1%). This was probably partly due to interviewers skipping it, as this was the only item asked in the last section of the questionnaire, in which interviewers noted the circumstances of the interview. Response did not differ with the sensitivity of questions. Only 0.6% of men and 0.3% of women refused to report their age at first heterosexual intercourse and 0.6% of men and 1.1% of women refused to report how old they were at the time of their first heterosexual experience. Similarly, 0.4% of men and 0.2% of women refused to answer the question on how often they had felt sexually attracted to the other sex and how often to the same sex. Also, only 0.8% of men and 0.1% of women refused to report whether they had had exclusively heterosexual experiences or exclusively homosexual or whether they had had both.

Almost all respondents who reported their age at first heterosexual intercourse answered more detailed questions about the event (99.7% of men and 99.9% of women). Of those, a great majority responded face-to-face and only 1.0% of men and 1.3% of women completed a self-administered booklet. More details about item non-response for these questions are given below.

Only those respondents who reported some sexual experience, with either males or females, were asked to anonymously complete self-administered questionnaires with intimate questions

about sexual lifestyles and HIV risk behaviour. Very few, 1.8% of men and 1.0% of women, refused. Thus, 807 men and 874 women were given these questionnaires to complete. Of these, 775 men and 845 women reported already having had sexual intercourse with either men or women. Response to almost all questions asked to everyone was above 97%. Response to the very sensitive ones was equally high. The question about ever having had a homosexual experience was not answered by only 0.9% of men and 0.7% of women, the question about having ever paid women or men for sex by 3.0% and by 1.9% of men respectively, the question about having ever received payment for sex by 3.9% of men and 2.7% of women, and the question about having ever injected illicit drugs was not answered by 1.1% of men and 0.3% of women. Overall, questions about ever having been diagnosed with specific sexually transmitted infections had the highest item non-response. However, the response improved much from the high (15%) non-response in pre-testing. Among men, the highest item non-response was 5.0% for the question about syphilis and among women 6.6% for the question on pelvic inflammatory disease. Non-response to some of the questions not asked to all was much higher. For example, many more respondents reported having had three or more partners during past five years (300 men and 134 women), than responded to the detailed questions about the three most recent partners (61% of these men and 57% of these women).

Item non-response was probably due to several reasons and not just objections to particular questions. These would include difficulties in remembering or never knowing certain facts. Reasons for item non-response in the self-administered questionnaires also included difficulties in understanding some questions, failure to follow routing instructions, and unwillingness to answer rather many detailed questions about the three most recent partnerships. Also, some of the reported values were recoded into missing because of obvious internal inconsistencies.

4.4.1. First heterosexual intercourse

Several questions about first heterosexual intercourse and the first partner were asked to 782 men and 847 women who reported at what age they had experienced first heterosexual intercourse.

Non-response for relatively straightforward questions about the first heterosexual partner and the contraception method used was below 1%, but additional respondents reported never knowing or not remembering answers to some questions. Thus, 2.3% of men and 1.4% of women reported not remembering the age of their first heterosexual partner and an additional 0.8% of men and 0.5% of women reported not ever having known. Similarly, 9.0% of men and

12.6% of women never knew whether it was also the first time for their partners, 1.7% of men and 0.7% of women could not remember whether they used any contraception method, and 0.3% of men and 0.2% of women whether a condom was used.

Non-response for more demanding questions about the type of relationship with the first heterosexual partner, whether the event was anticipated or planned and about the triggering context was slightly higher and ranged from 1.0% to 2.3%. In addition, 4.1% of men and 3.9% of women reported not remembering whether the event was anticipated or planned, 0.1% of men and 0.2% of women reported not remembering what was the triggering context, and 0.5% of men and 0.7% of women "could not say" what was the answer for the latter question.

For a sensitive question on whether both partners wished the first heterosexual intercourse equally or one of them wished it more, response was missing for only 0.1% of men and 0.2% of women, but, 4.6% of men and 2.5% of women reported not remembering. For the question on how they felt about the timing of first heterosexual intercourse after it happened the response was missing for 0.5% of men and women and additional 4.9% of men and 3.5% of women reported that they could not say.

Overall, the proportion of missing values for questions related to first heterosexual intercourse ranged from 0% to the highest 9.1% for men and 12.6% for women. This highest item non-response was for the question on whether it was also the first time for their partner and was mostly due to respondents not knowing. The second highest proportion of missing values was 5.9% for men and 5.7% for women for the question on whether the event was anticipated or planned, mostly due to respondents not being able to remember.

4.4.2. Sexual partnerships, practices and HIV risk behaviours

As already described above, the information about all variables used in analyses of sexual partnerships, practices, and risk behaviours for HIV and *Chlamydia trachomatis* (except for demographic and social characteristics) was obtained from anonymously self-administered questionnaires. These were completed by 807 men and 874 women. In spite of anticipated poorer response with such administration mode, item response for almost all questions everyone was asked, including the very sensitive questions, was above 97%. The low item non-response for some of the most sensitive question (homosexual experience ever, ever having paid women or men for sex (men only), ever received payment for sex, ever injected illicit drugs) was already described above. The item non-response for another more sensitive question, on when, if ever, was the last occasion that women were forced into heterosexual intercourse was 1.7%.

The response for all questions about the numbers of heterosexual partners for different time periods (past month, past year, past five years, and lifetime) was above 97% for men and above 98% for women. Only respondents who reported heterosexual partners for particular periods were referred to additional questions that included questions on concurrency, new heterosexual partners during the respective period, and numbers of partners with whom a condom was used on all occasions of sexual intercourse. For the past year the item non-response for concurrency was 3.0% for men, 1.0% for women, for having formed a new partnership 2.2% for men and 1.4% for women, and for the rather difficult question on numbers of partners with whom a condom was used on all occasions of sexual intercourse, 5.5% for men and 1.5% for women. The item non-response for corresponding questions for other time periods never reached 5% with one exception, lifetime concurrency (7.6% of men, 4.8% of women). For some questions which were rather difficult to answer and which were also asked to fewer respondents (after filtering), which resulted in lower denominators, the item non-response was much higher. An example of a question with such high item non-response was the question on the number of new heterosexual partners in the past year, where the proportion of missing values reached 22.5% for men and 14.6% for women. Two more such examples were the questions on the cumulative number of lifetime paid female partners of men and the corresponding number of paid non-Slovenian partners (both item non-responses were 39.7%).

All questions about the last time the respondent experienced different penetrative and non-penetrative heterosexual practices (vaginal intercourse, fellatio, cunnilingus, anal intercourse, and genital contact without penetration) had a response of over 95%. The item non-response was the highest for anal intercourse (4.8% of men, 3.4% of women). The question on the frequency of heterosexual intercourse during the past month had another outstandingly high item non-response (10.8% for men, 10.1% for women).

The highest item non-response among the questions that were asked to all respondents was for the question on the number of occasions of heterosexual intercourse with non-Slovenian partners (3.8% for men and 3.3% for women). Probably the main reason for this was that many of those respondents who had non-Slovenian steady partners or spouses were simply unable to provide a sensible lifetime estimate. Also the item non-response for all the following questions on details about the most recent such event or partnership was rather high, ranging from 7.6% to 15.5%.

4.5. Internal consistency, confidentially and anonymously reported information

Many respondents were willing to reveal socially less accepted behaviours anonymously, in self-administered questionnaires, but not to interviewers during face-to-face interview. Only half (50.0% men and 51.4% women), who reported some homosexual experiences in the self-administered questionnaire did so to interviewers. However, the great majority of those who anonymously reported oral or anal homosexual sex, told interviewers that they had some homosexual experience (six among nine men and seven among nine women). Another frequent inconsistency was reporting one heterosexual partner ever in the face-to-face interview and then two or more partners in the self-administered questionnaire. This was the case for almost one in ten men (9.4%) and one in twenty women (4.9%), who during the face-to-face interview said that they only had one partner.

In contrast to being embarrassed to report several sexual partners, some might have found it embarrassing to disclose that they had not had sex yet. For example, a 33 year old, single woman told the interviewer that she had her first sexual intercourse with a man at the age of 15 and then reported to never having had sex with a man in the self-administered questionnaire. She also answered most face-to-face questions about the first heterosexual intercourse with "I do not remember" or "I can not say". The interviewer judged her to be slightly embarrassed, but to have no difficulties in understanding.

Less frequently, inconsistencies between information reported face-to-face and that in self-administered questionnaires were identified for social characteristics that are usually perceived as less sensitive. For example, a few people who told interviewers that they were married, reported not to be in the self-administered questionnaires (1.3% men and 1.1% women). A few respondents reported higher or less often lower level of attained education for their main partner in the self-administered questionnaire (3.8% men and 4.0% women). Some of these inconsistencies may have resulted from unintentional error.

As many questions were asked in self-administered questionnaires, there were many possibilities for respondents to report information that was not consistent throughout all four questionnaires. Men's responses were less consistent than women's. Because of some internally inconsistent information, doubts about validity were most often noted for the second self-administered questionnaire (for 10.4% men and 4.9% women), followed by the third (for 5.3% men and 1.9% women), and the first (for 2.1% men and 1.8% women). Internally inconsistent information was very rarely, detected in the last self-administered questionnaire (for 0.2% men and no women).

5. First heterosexual intercourse

5.1. Age at first heterosexual intercourse

The median age at first heterosexual experience (any kind of contact with another person considered as sexual by respondent) was 15 years for men (10^{th} and 90^{th} percentile: 12, 18) and 16 years for women (10^{th} and 90^{th} percentile: 14, 19). With decreasing respondents' age, the median age has declined for both men and women, becoming 15 years for both genders from more recent cohorts. For men, the decline from the median age of 16 years occurred for cohorts born in THE mid fifties, and remained stable at 15 years for all cohorts born after 1954. For women, it declined from a higher median age of 17 years, for those born during 1950-1954, to the age of 16 for all cohorts born during 1955-1979 and declined further to the age of 15 for women born during 1980-1982 (Table 5.1).

Table 5.1. Age at first heterosexual experience and at first heterosexual intercourse for men and women according to birth cohorts (age at interview)

	First experience Age in years				First intercourse Age in years			
	25th centile	Median	75th centile	Base	25th centile	Median	75th centile	Base
Men	14	15	17	877	16	17	19	877
Birth cohort (age[a])								
1950-1954 (45-49)	14	16	18	145	16	18	20	145
1955-1959 (40-44)	14	15	17	136	17	18	19	136
1960-1964 (35-39)	14	15	17	137	16	18	19	137
1965-1969 (30-34)	14	15	17	131	16	17	19	131
1970-1974 (25-29)	13	15	16	131	16	17	19	131
1975-1979 (20-24)	14	15	16	138	16	17	19	138
1980-1982 (18-19)	13	15	16	59	16	17	18	59
Women	15	16	17	854	17	18	19	861
Birth cohort (age[a])								
1950-1954 (45-49)	16	17	18	132	17	18	19	134
1955-1959 (40-44)	15	16	18	143	17	18	19	143
1960-1964 (35-39)	15	16	17	137	17	18	19	139
1965-1969 (30-34)	15	16	17	128	17	18	19	128
1970-1974 (25-29)	15	16	17	126	17	18	19	127
1975-1979 (20-24)	14	16	17	128	16	17	19	130
1980-1982 (18-19)	14	15	17	60	16	17	18	60

a – approximate age at interview

Methods for complex survey data (svy commands) in STATA were used to obtain weighted estimates.
Records of individuals who reported not to have had first heterosexual experience and / or intercourse yet were included in analysis (coded 96), as eventually almost everyone experiences both. All individuals who refused to report either the age at first heterosexual experience or intercourse were excluded from relevant analyses. Four individuals who reported the first intercourse at a younger age than first heterosexual experience were excluded from analyses.

The median age at first heterosexual intercourse (FHI; involving penetrative sex) was 17 years for men (10^{th} and 90^{th} percentile: 15, 21) and 18 years for women (10^{th} and 90^{th} percentile: 16, 21). With decreasing respondents' age, the median age has declined from 18 years to 17 years

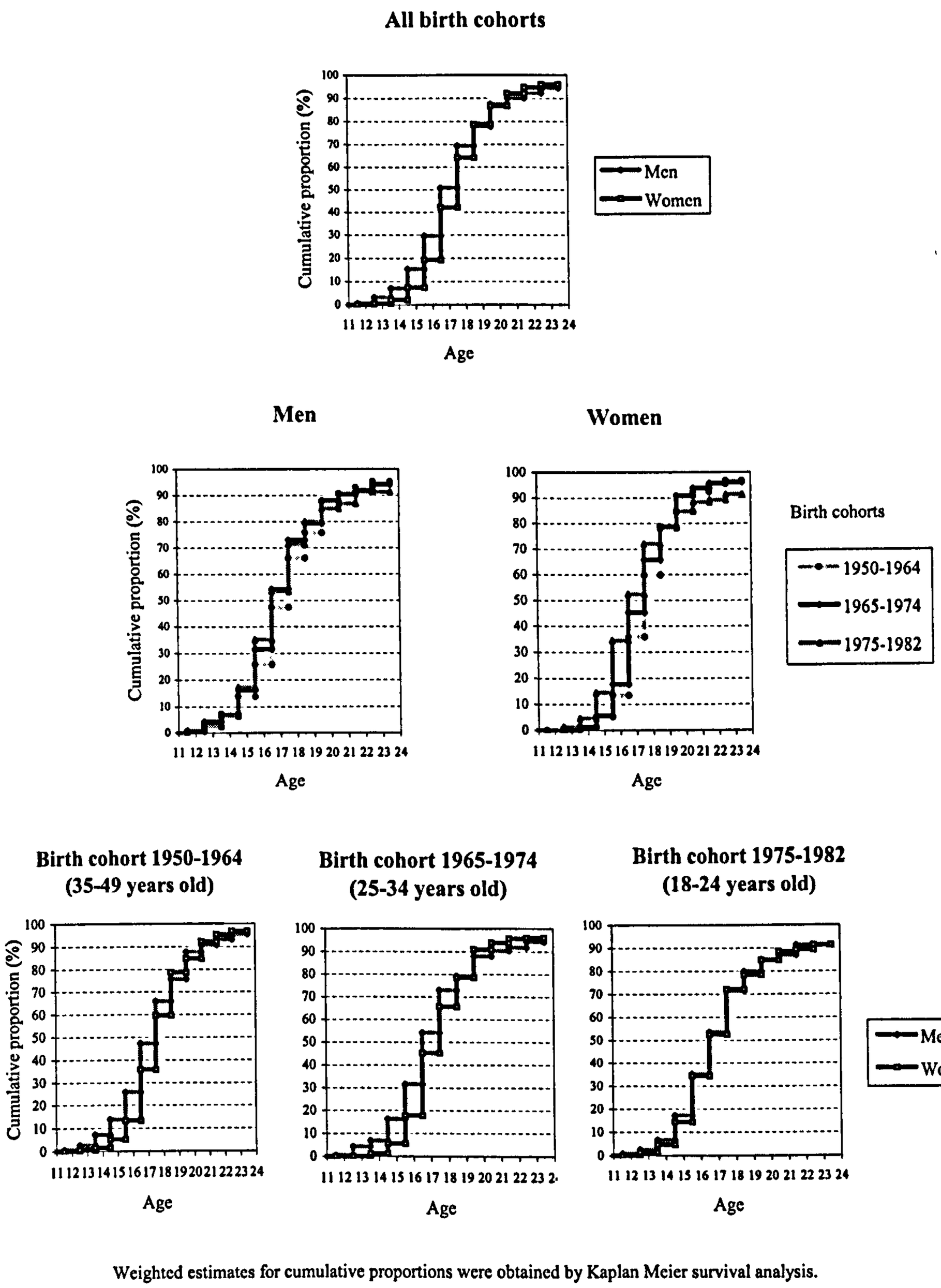
for both men and women born recently. For men, the decline occurred with the cohort born in THE late sixties and for women with the cohort born in the late seventies (Table 5.1).

The median time interval between first heterosexual experience and FHI has remained 2 years for all surveyed birth cohorts of men and varied between 1 and 2 years for cohorts of women, without an obvious upward or downward trend. The median time intervals between these events together with 25^{th} and 75^{th} quartiles for 5 years birth cohorts are shown in Table A 5.1.

Cumulative proportions of all men and women as well as men and women from three broader birth cohorts (born during 1950-1964, 1965-1975, and 1975-1982) who had experienced FHI by defined ages are plotted on Figure 5.1 and shown in Table A 5.2. The table also shows cumulative proportion estimates assuming that maximum bias occurred, and that everyone who had not yet had heterosexual intercourse by the time of the survey had it before their next birthday. Log rank test results comparing the entire Kaplan Meier failure curves and curves truncated at the age 17 (for early intercourse) are shown also.

Overall, men seem to have experienced FHI at slightly younger ages than women, but the difference in the two cumulative proportion curves could be due to chance (Log rank test (Log RT) p=0.17).

Among men and women, the ages at FHI seem to have been declining with decreasing current age, becoming lower in the more recent birth cohorts. However, the overall observed decline seems not to be substantial either for men or for women, and could be due to chance (Log RT p=0.68 and p=0.08). The differences in cumulative proportion curves for the age at FHI between the three different birth cohorts seem to be greater for women. If the most extreme bias occurred and those who had not yet experienced FHI by the time of the survey experienced it before their next birthday, most recent male and female cohorts would experience FHI much earlier than the plotted Kaplan Meier survival function estimates. The difference between cohorts would consequently become significant (Log RT p<0.01). Such extreme bias assumptions are clearly unrealistic, but at least some bias could be expected to have occurred, as more recent cohorts have been known to experience FHI at earlier ages. This further supports the borderline evidence (Log RT p=0.08) that women from the most recent cohort were experiencing FHI at earlier ages. Most substantial increases in the proportions of women experiencing FHI by defined ages for the two more recent cohorts (1965-1974 and 1975-1983) occurred at ages 15, 16, 17, and 18 (Figure 5.1). The greatest increase occurred at age 16. Among women born during 1975-1982 34.4% had already experienced FHI before turning 17 (by the age of 16) in comparison to 17.7% and 13.2% among those born during 1965-1974 and during 1950-1964.



Weighted estimates for cumulative proportions were obtained by Kaplan Meier survival analysis.

Figure 5.1.Cumulative proportions of men and women who have experienced first heterosexual intercourse by defined age until the age of 23

Finally, there appears to be a similar gender gap in the age at which men and women born during 1950-1964 and 1965-1974 experienced FHI, although the gap was not statistically significant (Log RT p=0.28 and p=0.43). This gap, if it existed, seems to have closed completely with the most recent birth cohort born during 1975-1982 (Log RT p=0.78).

5.2. Early first heterosexual intercourse

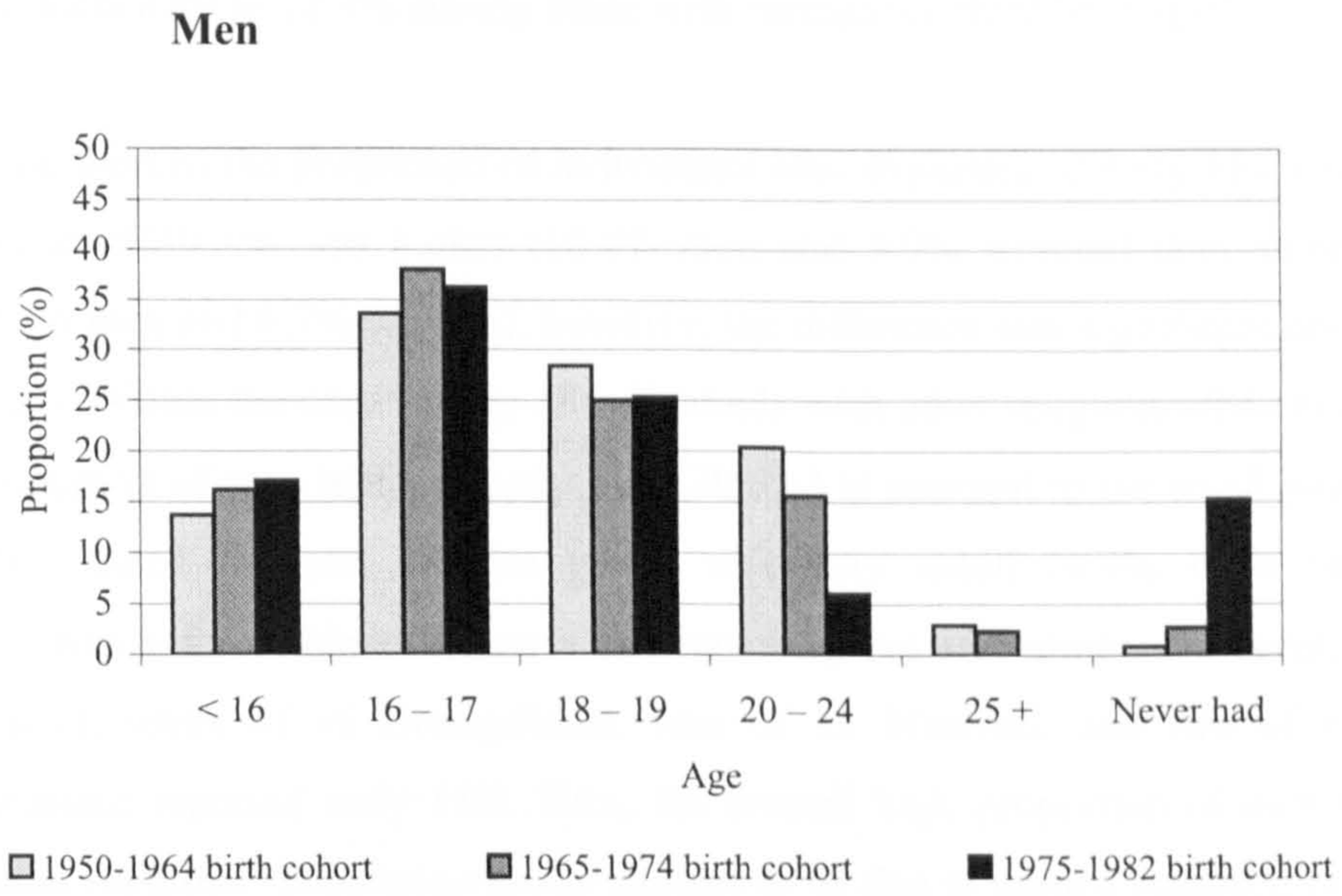
A sizeable minority of young people, more men than women, become sexually active before the age of 16 and even before the age of 15. Overall, 15.2% (CI_{95} 12.7%-18.1%) men and 7.4% (CI_{95} 5.8%-9.3%) women reported having had FHI before the age of 16 and 7.0% (CI_{95} 5.1%-9.4%) men and 2.1% (CI_{95} 1.4%-3.3%) women before the age of 15.

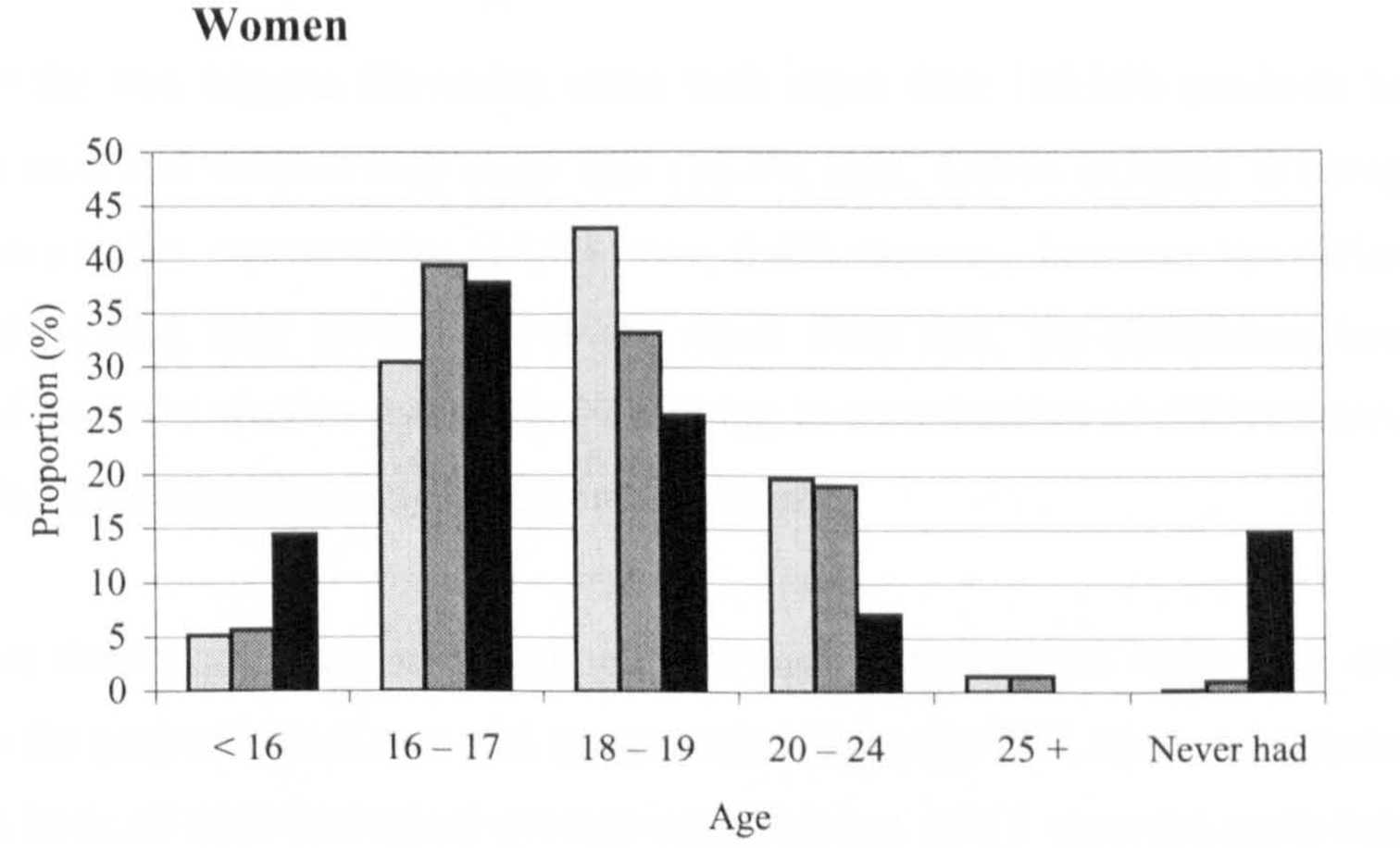
The variation in proportions of respondents with early FHI (before the age of 16) with birth cohort, some social characteristics including the structure of family of origin until the age of 15, and the reported main source of information about sexual matters together with the results of univariate analyses of association are shown in Table A 5.3.

The proportion of men with early FHI varied from 11.8% among those born during 1955-1959 to 22.8% among those born during 1980-1982. Except for the outstandingly high increase in the latter group, there was no evidence of pattern (p=0.24). Among women born before the seventies, the proportion of those with early FHI varied between 1.8% (1965-1969 birth cohort) and 6.2% (1955-1959 birth cohort). Then it increased to 9.6% among those born during 1970-1974 and further to 14.1% and 15.0% for those born during 1975-1979 and 1980-1982 (p<0.01). The gender gap for early FHI, which has been apparent for earlier birth cohorts, has closed.

This closing of the gender gap is also shown in Figures 5.1 and 5.2. The gap, apparent for the two broader cohorts (1950-1964 and 1965-1974) (Log RT p<0.01), has closed almost completely for those born during 1975-1982 (Log RT p=0.34). In the latter birth cohort, 17.1% men and 14.4% women have had FHI before the age of 16 and 6.6% men and 4.6% women before the age of 15. A substantial increase in early intercourse among women from the most recent birth cohort occurred especially among 15 year olds and to a slightly lower extent among 14 year olds.

Early FHI was more common among men and women with the lowest education, not even first stage secondary, but the difference was significant only for women. Among women with less than first stage secondary education 15.5% experienced early FHI in comparison to between





For the most recent cohort the estimates of proportions of individuals having experienced first heterosexual intercourse in age groups 18 plus are slightly biased. Some of those individuals who had not yet experienced the first intercourse before the survey, may have eventually experienced it while still in the particular age group. For the 1965-1975 cohort the estimates in age groups 25 plus are also slightly biased, but the bias is almost negligible. The bias is negligible for the earliest cohort. Methods for complex survey data (svy commands) in STATA were used to obtain weighted estimates

Figure 5.2. Proportions of men and women with experience of first heterosexual intercourse at different ages

5.6% and 5.4% among those with first or second stage secondary or third level education ($p<0.01$). In contrast to this one step change among women, the proportion of men with early FHI decreased gradually with increase in education levels from 19.4% among those with less than first stage secondary to 12.3% among those with recognised third level ($p=0.36$).

Among men and women the proportion of individuals who experienced early FHI among those with no religious affiliation was higher (18.6% men and 9.0% women) than among Roman Catholics (12.6% men and 6.7% women), however, the difference was significant only for men ($p=0.04$, $p=0.21$). Within the small group of individuals with other religious affiliations, quite a substantial proportion of men reported early FHI (30.7%) in contrast to the small proportion of women (4.9%). Since the size of this group was very small (4.9% male and female respondents), it was not possible to compare different religious affiliations. However, exploring the data for men, seven of 16 Evangelicals, four of 13 Muslims, and two of 11 Serbian Orthodox Christians reported early FHI. Thus, the overall high proportion of men with early FHI in the "other religions" population group appears to be due to quite a balanced contribution from all other religious affiliations concerned.

Inhabitants of the two biggest Slovenian cities with more than 100,000 residents had higher proportion of men and women with early FHI (18.7% men, 12,0% women) in comparison to those living in smaller communities (14.5% men, 6.3% women), however the difference was significant for women only ($p=0.23$, $p=0.02$). Apart from that, the differences between the proportions of men and women with early FHI living in communities of different sizes did not reflect an ordered pattern with decreasing community size.

Differences in family structure in childhood and early adolescence were also reflected in differences in the proportions of men and women reporting early FHI. Men and women who did not live with both of their biological parents until the age of 15 reported early heterosexual intercourse more often than those who did (24.5% men and 10.8% women in comparison to 13.2% men and 6.7% women). The difference was only significant for men ($p<0.01$, $p=0.12$).

Not surprisingly, those men and women who reported their first heterosexual partner as the most important source of information about sexual matters had the greatest proportion of early heterosexual intercourse (19.6% men, 13.1% women). They were followed by those mostly informed by friends and siblings (17.0% men, 9.5% women). The proportions were lowest among those who were mostly informed by parents (11.0% men, 4.0% women) and those individuals who acquired most of their knowledge about sexual matters in school (11.4% men, 4.0% women). The differences were less marked for men than for women ($p=0.25$, $p<0.01$).

Women who were younger at the time of their physical sexual maturation, reflected in earlier menarche, experienced early FHI more frequently. Among those who reported to have been less than 11 years old at menarche 17.3% experienced early heterosexual intercourse and among those who were 11 or 12 and 13 or 14 years old at menarche 9.8% and 7.5% respectively. Only 2.4% women with menarche at the age of 15 or later reported early FHI ($p_t<0.01$).

The results of multivariate analysis of the association of early FHI with respondents' birth cohort, selected social characteristics, the reported main source of information about sexual matters, and age at menarche for women, are presented in Table 5.2.

There was no statistically significant association between men being born more recently and FHI before the age of 16. Also, living in the two biggest cities with more than 100 000 inhabitants did not increase the risk for early FHI. The only identified risk factor for early FHI among men was related to the family structure in their childhood and early adolescence. Those who did not live with both biological parents until the age of 15 (17.6%), were 2.1 (CI_{95} 1.3 – 3.4) times more likely to experience early FHI than those who did. There was no evidence that men with higher education or those for whom the main source of information about sexual matters were their parents or school, were less prone to early FHI.

In contrast, several risk factors for early FHI as well as protective influences were identified for women. Women born recently were more prone to experience the FHI before the age of 16. For the most recent birth cohort (1975-1982) the risk was 4.7 (CI_{95} 2.5-8.8) times higher in comparison to the 1950-1964 birth cohort. Women who reached their physical sexual maturity sooner, as reflected in menarche before the age of 13, were 1.7 (CI_{95} 1.0 – 2.0) times more likely to experience early FHI. Also, women from the two biggest cities were at a 2.5 (CI_{95} 1.3–4.8) times higher risk and those who did not live with both biological parents in childhood and early adolescence at a 1.7 (CI_{95} 0.9–3.3) times higher risk. Higher educational level and acquiring most of the knowledge about sexual matters from authoritative sources had a strong protective effect against early FHI. Those who achieved higher education than the first stage secondary were five times less likely to have experienced early FHI (both adjusted OR 0.2; 1st or 2nd stage secondary CI_{95} 0.1–0.3 and 3rd level CI_{95} 0.1–0.5). If the most important reported source of information about sexual matters were either parents or school the risk was three times lower (both adjusted OR 0.3; parents CI_{95} 1.0–0.6 and school CI_{95} 0.1–0.9).

Table 5.2. Association of early first heterosexual intercourse (before the age of 16) with birth cohort, education, community size, not living with both parents until age 15, and main source of information about sexual matters for men and women (multivariate analysis)

	FHI[a] <16 years old		Unadjusted		Adjusted[d]	
	%	Base	OR[b]	p value (95% CI[c])	OR[b]	p value (95% CI[c])
Men						
Birth cohort (age[d])						
1950-1964 (35-49)	14.1	407	1	p=0.62	1	p=0.44
1965-1974 (25-34)	16.3	261	1.2	(0.7 – 2.0)	1.3	(0.8 – 2.2)
1975-1982 (18-24)	16.9	196	1.2	(0.8 – 2.0)	1.3	(0.8 – 2.2)
Education						
<1st stage secondary	19.9	111	1	p=0.32	1	p=0.24
1st or 2nd stage secondary	15.2	633	0.7	(0.4 – 1.3)	0.7	(0.4 – 1.2)
3rd level	12.1	119	0.6	(0.2 – 1.2)	0.5	(0.2 – 1.2)
Community size						
<100,000	14.7	721	1	p=0.26	1	p=0.17
>100,000	18.7	143	1.3	(0.8 – 2.2)	1.4	(0.9 – 2.3)
Living with both parents until 15						
Yes	13.4	709	1	p<0.01	1	p<0.01
No	24.5	154	2.1	(1.3 – 3.4)	2.1	(1.3 – 3.4)
Main sex information source						
Peers / other	16.8	648	1	p=0.24	1	p=0.25
Parents	11.0	109	0.6	(0.3 – 1.4)	0.6	(0.3 – 1.3)
School	11.4	107	0.6	(0.3 – 1.2)	0.6	(0.3 – 1.3)
Women						
Birth cohort (age[d])						
1950-1964 (35-49)	5.0	400	1	p<0.01	1	p<0.01
1965-1974 (25-34)	5.7	255	1.1	(0.5 – 2.4)	1.4	(0.7 – 3.0)
1975-1982 (18-24)	14.4	183	3.2	(1.8 – 5.6)	4.7	(2.5 – 8.8)
Education						
<1st stage secondary	15.9	155	1	p<0.01	1	p<0.01
1st or 2nd stage secondary	5.3	509	0.3	(0.2 – 0.5)	0.2	(0.1 – 0.3)
3rd level	5.4	173	0.3	(0.1 – 0.8)	0.2	(0.1 – 0.5)
Community size						
<100,000	6.1	676	1	p=0.01	1	p<0.01
>100,000	12.2	162	2.1	(1.2 – 3.9)	2.5	(1.3 – 4.8)
Living with both parents until 15						
Yes	6.7	705	1	p=0.18	1	p=0.01
No	10.2	132	1.6	(0.8 – 3.1)	1.7	(0.9 – 3.3)
Main sex information source						
Peers / other	9.6	508	1	p<0.01	1	p<0.01
Parents	3.6	255	0.3	(0.2 – 0.7)	0.3	(0.1 – 0.6)
School	4.2	75	0.4	(0.2 – 1.1)	0.3	(0.1 – 0.9)
Age at menarche						
13 years or older	6.1	604	1	p=0.03	1	p=0.05
< 13 years old	10.5	234	1.8	(1.1 – 3.1)	1.7	(1.0 – 2.9)

a – first heterosexual intercourse
b – odds ratio
c – confidence interval
d – adjusted for all other variables in the table
e – approximate age at interview
Methods for complex survey data (svy commands) in STATA were used to obtain estimates of proportions and numbers Of individuals. Logistic regression for survey data was used to compute pseudo-maximum likelihood estimates of odds Ratios with 95% CI and results of adjusted Wald tests for significance.
Only 863 men and 838 women without missing values for any of the variables in the model were included into analyses.

After adjusting for other factors (birth cohort, education, community size, living with both parents until the age of 15, main source of information about sexual matters and age at menarche for women only) there was no evidence that Roman Catholic men or women were less prone to early FHI than individuals with no religious affiliation.

The variation in proportions of respondents with very early FHI (before the age of 15) with birth cohort, selected social characteristics including the structure of family of origin until the age of 15, and the reported main source of information about sexual matters together with the results of univariate analyses of association are shown in Table A 5.4. The results of multivariate analysis exploring their joint effects on very early FHI are presented in Table 5.3.

As for early FHI, the only identified risk factor for very early FHI among men was related to the family structure in their childhood and early adolescence. Those who did not live with both biological parents until the age of 15 were 2.5 (CI_{95} 1.4 – 4.6) times more likely to experience early FHI than those who did.

Also, similarly to early FHI among women, several risk factors as well as protective influences were identified for very early FHI. Women born recently were much more likely to experience FHI before the age of 15. The risk was 11.7 (CI_{95} 3.3-41.2) times higher for the most recent birth cohort (1975-1982) in comparison to the 1950-1964 birth cohort. Women from the two biggest cities were at a 6.2 (CI_{95} 2.2–17.8) times higher risk. Women who did not live with both biological parents in childhood and early adolescence were at 5.5 (CI_{95} 1.7–17.0) times higher risk. Attained higher educational level and acquiring most of the knowledge about sexual matters from parents had a protective effect. Those who achieved higher education than the first stage secondary were ten to five times less likely to have experienced early FHI (first or second stage secondary CI_{95} 0.0–0.1 and third level CI_{95} 0.1–1.0). If the most important reported source of information about sexual matters were parents the risk was ten times lower (CI_{95} 0.0–0.3). In contrast to the risk for early FHI, there was no evidence that women who reached their physical sexual maturity sooner, as reflected in menarche before the age of 13, were more prone to very early FHI.

Table 5.3. Association of very early first heterosexual intercourse (before the age of 15) with birth cohort, education, community size, not living with both parents until age 15, and main source of information about sexual matters for men and women (multivariate analysis)

	FHI[a] <15 years old		Unadjusted		Adjusted[d]	
	%	Base	OR[b]	p value (95% CI[c])	OR[b]	p value (95% CI[c])
Men						
Birth cohort (age[d])						
1950-1964 (35-49)	7.5	407	1	p=0.92	1	p=0.99
1965-1974 (25-34)	6.8	261	0.9	(0.4 – 1.8)	1.0	(0.5 – 2.0)
1975-1982 (18-24)	6.7	196	0.9	(0.5 – 1.7)	1.0	(0.5 – 2.0)
Education						
<1st stage secondary	9.4	111	1	p=0.64	1	p=0.64
1st or 2nd stage secondary	6.6	633	0.7	(0.3 – 1.5)	0.7	(0.3 – 1.5)
3rd level	7.4	119	0.8	(0.3 – 2.3)	0.7	(0.2 – 2.1)
Community size						
<100,000	6.6	721	1	p=0.29	1	p=0.28
>100,000	9.6	143	1.5	(0.7 – 3.2)	1.5	(0.7 – 3.2)
Living with both parents until 15						
Yes	5.7	709	1	p<0.01	1	p<0.01
No	13.5	154	2.6	(1.4 – 4.8)	2.5	(1.4 – 4.6)
Main sex information source						
Peers / other	7.7	648	1	p=0.35	1	p=0.47
Parents	6.8	109	0.9	(0.3 – 2.8)	0.9	(0.3 – 2.9)
School	3.5	107	0.4	(0.1 – 1.3)	0.5	(0.2 – 1.6)
Women						
Birth cohort (age[d])						
1950-1964 (35-49)	1.3	400	1	p=0.02	1	p<0.01
1965-1974 (25-34)	1.3	255	1.0	(0.2 – 4.5)	1.3	(0.2 – 8.1)
1975-1982 (18-24)	4.8	183	3.9	(1.2 – 12.6)	11.7	(3.3 – 41.2)
Education						
<1st stage secondary	6.3	155	1	p<0.01	1	p<0.01
1st or 2nd stage secondary	0.6	509	0.1	(0.0 – 0.2)	0.0	(0.0 – 0.1)
3rd level	2.6	173	0.4	(0.1 – 1.4)	0.2	(0.1 – 1.0)
Community size						
<100,000	1.3	676	1	p<0.01	1	p<0.01
>100,000	5.0	162	3.9	(1.6 – 9.8)	6.2	(2.2 –17.8)
Living with both parents until 15						
Yes	1.5	705	1	p=0.02	1	p<0.01
No	4.9	132	3.4	(1.2 – 9.1)	5.5	(1.7 – 17.0)
Main sex information source						
Peers / other	3.2	508	1	p=0.01	1	p<0.01
Parents	0.3	255	0.1	(0.0 – 0.6)	0.0	(0.0 – 0.3)
School	0.0	75	-	-	-	-
Age at menarche						
13 years or older	1.5	604	1	p=0.06	1	p=0.06
< 13 years old	3.6	234	2.5	(1.0 – 6.5)	2.2	(0.7 – 6.6)

a – first heterosexual intercourse
b – odds ratio
c – confidence interval
d – adjusted for all other variables in the table
e – approximate age at interview
Methods for complex survey data (svy commands) in STATA were used to obtain estimates of proportions and numbers Of individuals. Logistic regression for survey data was used to compute pseudo-maximum likelihood estimates of odds ratios with 95% CI and results of adjusted Wald tests for significance.
Only 863 men and 838 women without missing values for any of the variables in the model were included into analyses.

5.3. First partner and context of first heterosexual intercourse

Men's partners at FHI tend to be roughly the same age. There was no evidence of widespread sexual initiation of young men by older women. Approximately one third of men (32.2%) had an older first female partner, slightly fewer (29.2%) same age and a few more (38.6%) younger. Overall, age differences in years between first partners and respondents were quite small (25^{th} percentile, median, 75^{th} percentile: -1, 0, 1). This pattern has not changed much with time, except that age differences become smaller for men born more recently (Table 5.4). The pattern of age differences between men's first partners and themselves varied with the age at which FHI occurred. The older the men were at FHI, the more likely they were to have had younger partners (Table 5.4). Not even men with early FHI (before the age of 16) were much younger than their first partners (age differences 25^{th} percentile, median, 75^{th} percentile: -3, -1, 0); almost half (47.9%) had partners who were also under 16.

For women an older partner at FHI was the norm. This is very clear looking at age differences in years between first partners and respondents (25^{th} percentile, median, 75^{th} percentile: -5, -3, -1). Only a very small minority of women (2.0%) had younger first partners, of whom a great majority were at most one year younger. The pattern of age differences between women's first partners and themselves has not changed with time, but varied to some extent with the age at which the FHI occurred (Table 5.4). The older the women at FHI the more likely they had partners of a more similar age, and the more likely they were to have partners of the same age. Thus 20.2% women who had FHI at the age 20 or later had partners of the same age in comparison to only 8.2% women with FHI at age of 16 or 17. All women who had early FHI had either an older partner (90.4%) or a partner of the same age (9.6%).

Given the age differences described above, it was not surprising that more men reported their partners to be virgins than women. Overall, 41.2% (CI_{95} 37.8%-44.6%) men and 23.7% (CI_{95} 20.8%-26.9%) women reported having had FHI with a partner for whom it was also the first time. Men and women born recently reported their first partners to be virgins more often than those born earlier (49.6% men born during 1975-1982 in comparison to 40.9% born during 1950-1964 and 29.5% women born during 1975-1982 in comparison to 21.8% born during 1950-1964), but differences were not statistically significant. In general, the older the respondents were at the time of their FHI the more often they reported it to happen with a partner for whom it was also the first time (Figure 5.3), but differences were not statistically significant. There was one exception to this pattern. Men with early FHI reported a slightly higher proportion of partners for whom it was also the first time than men who had FHI at ages

from 16 to 19, but this difference was not statistically significant either. Not surprisingly, some men and women did not know whether it was also the first time for their partners.

Table 5.4. Difference between partners' and respondents' ages at first heterosexual Intercourse for men and women

		5th centile[c]	25th centile[c]	50th centile[c]	75th centile[c]	95th centile[c]	Base
Men		-7	-1	0	1	4	802
	Birth cohort (age[a])						
	1950-1964 (35-49)	-8	-1	0	1	4	391
	1965-1974 (25-34)	-7	-1	0	1	3	249
	1975-1983 (18-24)	-4	-1	0	1	2	163
	Respondent's age at FHI[b]						
	<16	-10	-3	-1	0	1	132
	16-17	-8	-2	0	0	2	303
	18-19	-5	0	0	1	3	218
	20+	-5	1	2	4	6	148
Women		-9	-5	-3	-1	0	810
	Birth cohort (age[a])						
	1950-1964 (35-49)	-9	-5	-3	-1	0	407
	1965-1974 (25-34)	-10	-5	-3	-1	0	244
	1975-1983 (18-24)	-10	-5	-3	-1	0	158
	Respondent's age at FHI[b]						
	<16	-12	-6	-4	-3	0	60
	16-17	-10	-5	-3	-2	0	294
	18-19	-9	-5	-3	-1	0	305
	20+	-9	-4	-2	0	1	151

a – approximate age at interview
b – first heterosexual intercourse
c – percentile
Methods for complex survey data (svy commands) in STATA were used to obtain weighted estimates.
Four individuals who reported the first heterosexual intercourse at a younger age than first heterosexual experience were excluded from analyses.

The majority of people had FHI with someone with whom they did not have an established relationship, but had known for some time, 52.6% (CI_{95} 48.9%-56.3%) men and 48.8% (CI_{95} 45.3%-52.2%) women. Fewer reported a steady relationship with their first partner, men less frequently than women (16.1%; CI_{95} 13.6%-19.0% men, 31.9%; CI_{95} 28.8%-35.2% women). This proportion appears to have increased among men born most recently (p=0.13) and has increased among women born most recently (p=0.01) (Table A 5.5). It has become extremely rare to have FHI within marriage, or with someone to whom marriage is planned. Not a single man reported FHI within marriage and very few women (1.5%; CI_{95} 0.7%-3.0%), not a single one among those born most recently. Pre-marital sex has become universal. Men reported FHI to have occurred with someone they had just met (9.5%; CI_{95} 7.4%-12.1%) or met recently (17.9%; CI_{95} 15.2%-21.0%) more frequently than women did (3.5%; CI_{95} 2.4%-4.9% and 10.5%; CI_{95} 8.4%=12.9%). Very few men reported their FHI to have been with a prostitute (0.8%; CI_{95} 0.3%-1.8%), and the proportion appears to have declined among those born most recently, but the differences were not significant. Variation in proportions of men and women

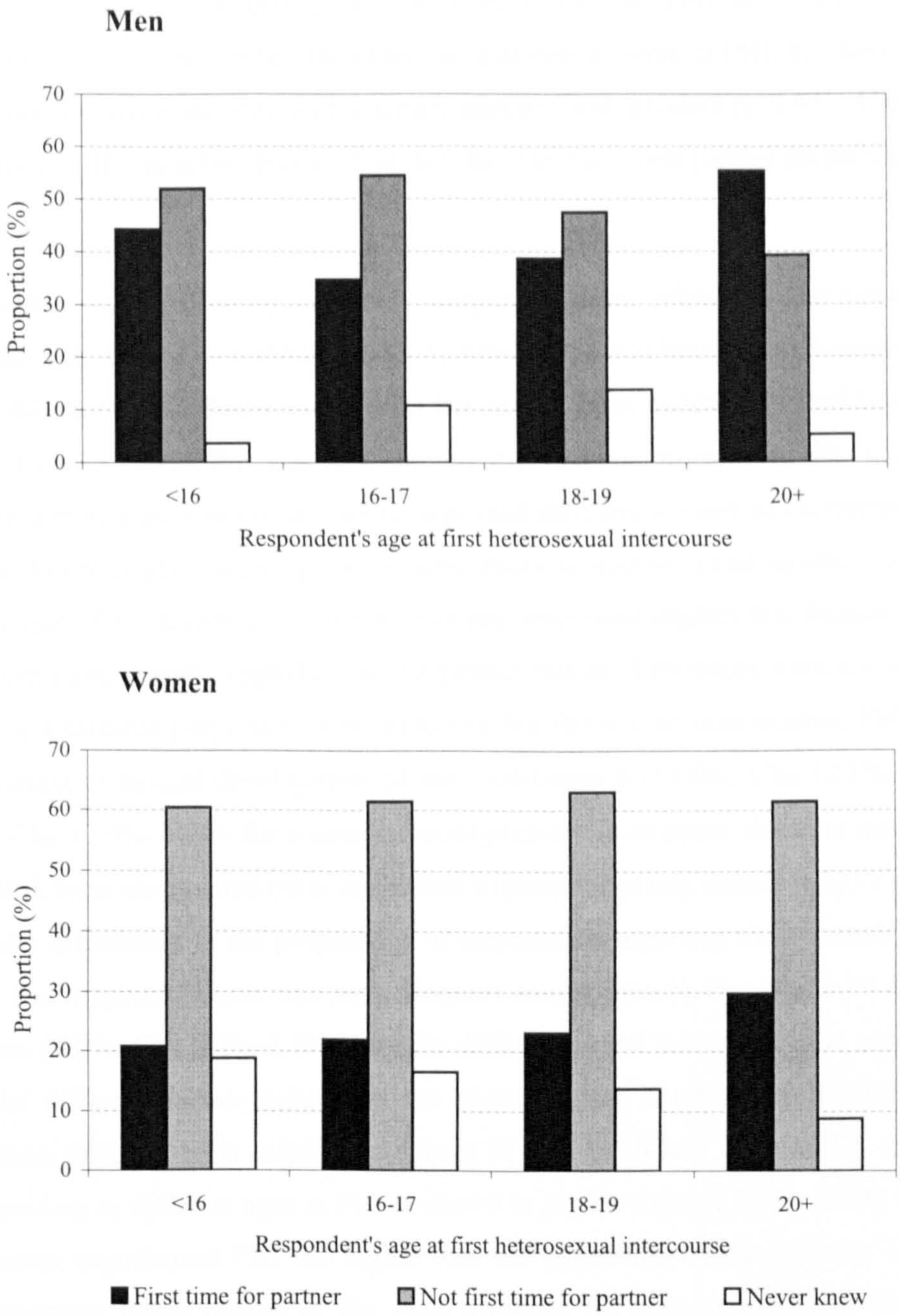


Figure 5.3. Whether the first time for partner according to respondent's gender and age at first heterosexual intercourse

experiencing FHI within different types of relationships according to birth cohort is shown in Table A 5.5 and variation according to respondents ages at FHI in Table A 5.6. Not surprisingly, regardless of the gender, the older the respondents were at FHI, the more often the event was reported to have occurred with a steady partner (both genders p_t=0.03). Also, women who were older at FHI less often reported that they had met their first partner recently (p_t=0.01).

Curiosity was the most frequently reported triggering factor related to the circumstances surrounding the FHI among men (35.2%; CI_{95} 31.6%-38.9%) and being in love among women (51.9%; CI_{95} 48.0%-55,9%). Being in love was the second most commonly cited factor among men (30.3%; CI_{95} 26.9%-33.9%) and curiosity the third among women (13.8%; CI_{95} 11.4%-16.6%). These differences in the main reasons that lead men and women to experience FHI are quite striking. Interestingly, curiosity has become more frequently cited among women born more recently (p_t<0.01). In contrast, being in love has been cited slightly less frequently among individuals born more recently regardless of the gender, but the differences were not statistically significant. For a sizeable proportion of respondents, but fewer men than women, FHI occurred within the context of natural development of their relationship (14.6%; CI_{95} 12.1%-17.5% for men, 20.8%; CI_{95} 17.9%-24.0% for women). Social pressure from peers, desire to lose virginity, and being drunk were rarely cited main contextual triggers for young people to have FHI. There were no gender differences in the proportions of respondents reporting these factors except for the desire to lose virginity, which was more frequent among men (4.4%; CI_{95} 3.1%-6.4%) than among women (1.0%; CI_{95} 0.4%-2.1%). Gender differences and minor variation in the relative importance of different factors related to the circumstances surrounding the FHI between individuals from different birth cohorts are shown in Figure 5.4 and Table A 5.5. In addition, variation according to different ages at FHI is shown in Figure 5.5 and Table A 5.6. The earlier men and women experienced FHI the higher was the proportion citing curiosity as the most important triggering factor related to the event (p_t<0.01 for men, p_t=0.01 for women). Not surprisingly, regardless of the gender, the older the respondents were, when experiencing FHI, the higher the proportion for whom FHI occurred within the context of natural development of a relationship (p_t=0.01 for men, p_t<0.01 for women). For women this occurred in parallel with a slight decline of the proportion of those who cited being in love as the main reason for FHI, which was not statistically significant. In contrast, more men who were oldest when it happened cited being in love as the main reason, although these differences were not statistically significant either.

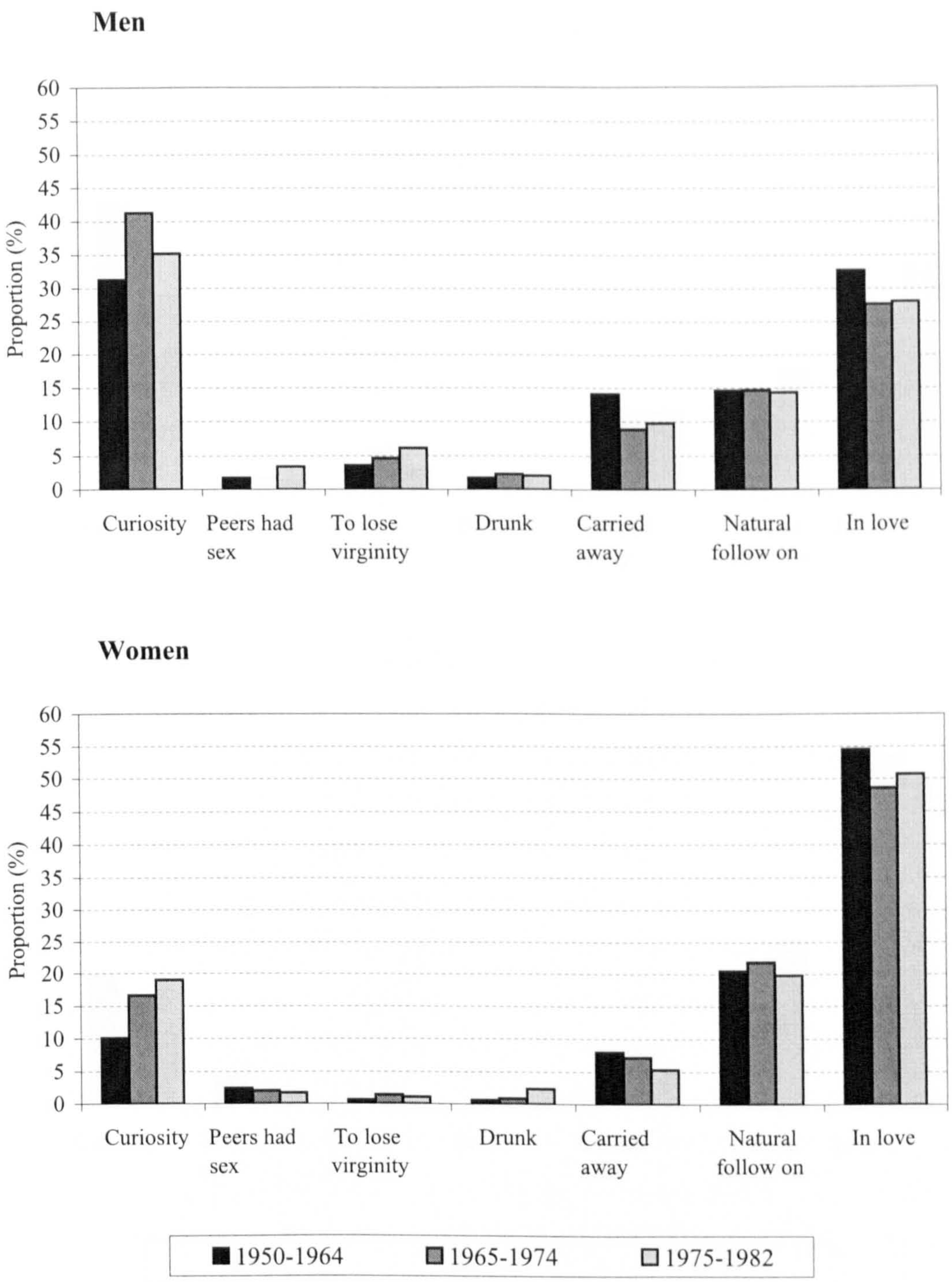


Figure 5.4. Most important triggering factors associated with first heterosexual intercourse for men and women according to birth cohort

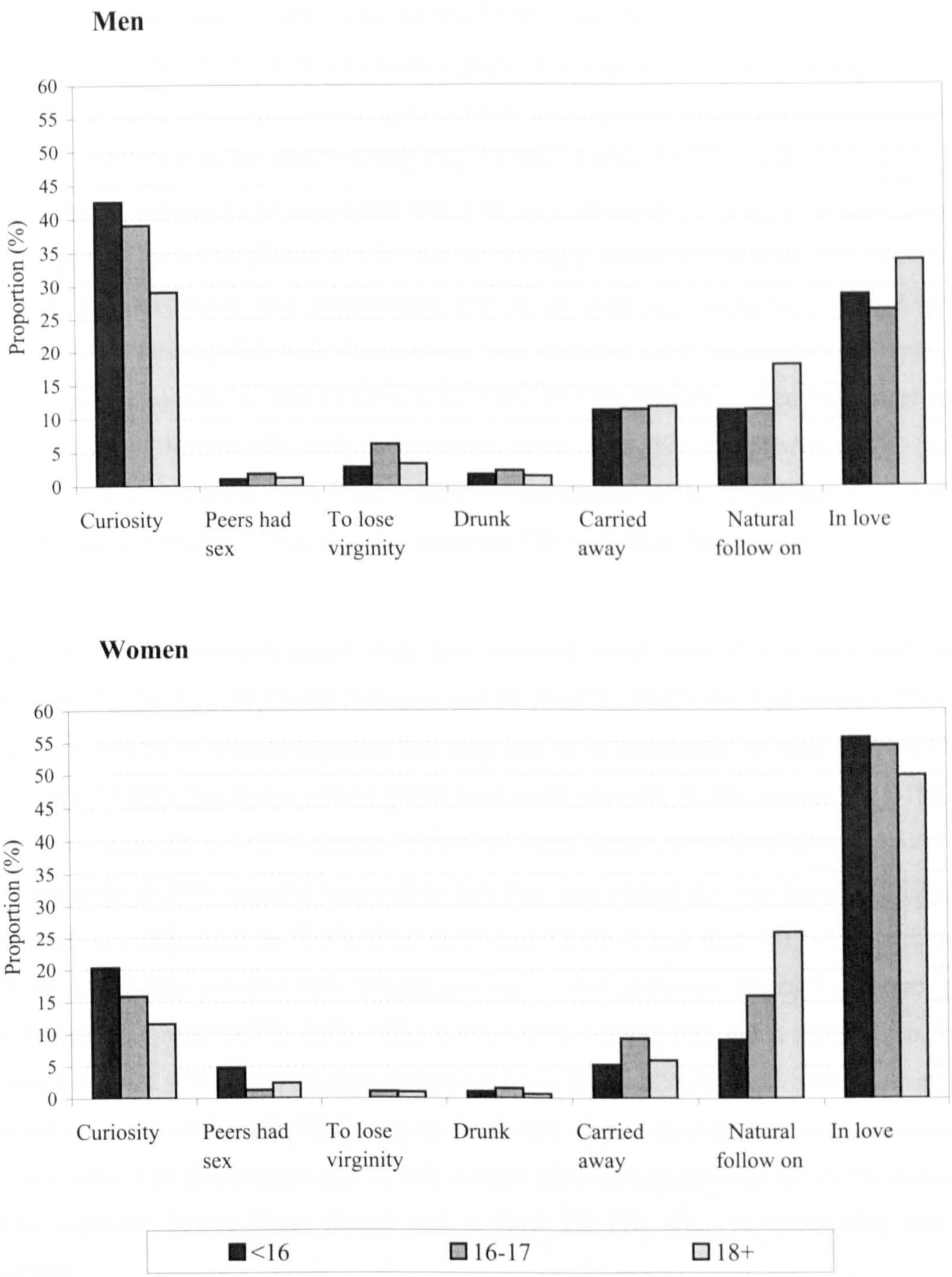


Figure 5.5. Most important triggering factors associated with first heterosexual intercourse for men and women according to their ages at the event

For almost half of men (48.4%; CI_{95} 44.9%-52.8%) and for only about a third of women (35.0%; CI_{95} 31.6%-38.5%) FHI was neither planned nor anticipated, but just happened on the spur of the moment. In contrast, to have planed FHI was reported more often by women (25.3%; CI_{95} 22.1%-28.9%) than by men (15.4%; CI_{95} 12.9%-18.4%). More planning of the event and less spontaneity appears to be associated with FHI for individuals born more recently, especially for men ($p=0.06$, $p=0.05$). (Table A 5.5). Not surprisingly, planning has been also reported more frequently by individuals who experienced FHI at an older age, especially women ($p=0.05$) (Table A 5.6). Planning FHI with their partner was reported more frequently by women (16.1; CI_{95} 13.5%-19.1%) than by men (12.0%; CI_{95} 9.8%-14.7%). However, men born most recently reported to have planned FHI with their partner more often than those born earlier ($p=0.06$), 17.8% of men born during 1975-1982, which is very similar to the proportion of women born during the same period (17.3%), reported planning FHI with their first partner.

The majority of respondents (more men than women) recall their FHI as an event that was wished for, 99.2% (CI_{95} 98.2%-99.7%) men and 83.3% (CI_{95} 80.0%-86.1%) women. Thus, quite a sizeable minority of women reported that they had to be persuaded by their partners (15.8%; CI_{95} 13.0%-19.0%), but fewer among those born more recently (9.3% among 1975-1982 birth cohort in comparison to 18.5% among 1950-1964 birth cohort; $p=0.03$) (Table A 5.5). Women who were older at FHI, reported more often that they had wished for it to happen (87.2% if age 18 or older in comparison to 78.6% if 16 or 18 and 78.1% if less than 16; $p<0.01$). In general, coercion at FHI (the question was "would you say ... that you were forced") was rare. Having been forced was reported by 0.9% (CI_{95} 0.4%-2.0%) women and not a single man. It is of concern that 4.2% (CI_{95} 1.0%-15.6%) of those women who had early FHI (before the age of 16) reported having been forced (Table A 5.6). It is even more worrying, that among women who had very early FHI (before the age of 15), a high estimated proportion of 15.5% (CI_{95} 3.9%-45.2%) reported having been forced and a third (32.7%; CI_{95} 14.4%-58.4%) had to be persuaded.

Most people, 79.9% (CI_{95} 76.6%-82.7%) men and 65.8% (CI_{95} 62.3%-69.0%) women, judged their FHI to have been well timed. There were marked differences among those who did not: 27.3% (CI_{95} 24.3%-30.5%) women reported feeling that the event took place too soon, compared with only 9.3% (CI_{95} 7.5%-11.6%) men, and 6.2% (CI_{95} 4.6%-8.3%) men said that they waited too long, compared with only 3.4% (CI_{95} 3.4%-4.9%) women. These views related strongly to age at which FHI occurred (Table 5.5). The younger the respondents were at FHI the more likely they were to regret the event already having occurred (both genders $p_t<0.01$). Among those with early FHI (before the age of 16), half of women (49.9%; CI_{95} 37.7%-62.2%)

judged the event to have occurred too soon, in contrast to less than a fifth of men (16.3%; CI_{95} 10.5%-24.3%).

Table 5.5. Feelings about the timing of first heterosexual intercourse for men and women according to their ages at the event

		Age at first heterosexual intercourse (in years)							
		<15 %	15 %	16-17 %	18-19 %	20+ %	p[a]	%	All (95% CI[b])
Men	Too soon	19.9	13.2	11.1	5.2	6.3	*<0.01*	9.4	(7.5-11.6)
	Waited too long	3.5	7.0	4.4	4.7	12.7	0.02	6.2	(4.6-8.3)
	About right	70.4	74.2	79.9	85.6	77.4	0.07	79.9	(76.6-82.7)
	No opinion	6.2	5.7	4.6	4.6	3.7	0.94	4.6	(3.2-6.6)
	Base	61	71	310	231	155		827	
Women	Too soon	51.1	49.5	37.2	20.2	13.5	*<0.01*	27.3	(24.3-30.5)
	Waited too long	0.0	2.8	2.0	3.5	6.3	0.17	3.4	(2.3-4.9)
	About right	30.6	45.2	57.3	73.2	76.9	*<0.01*	65.8	(62.3-69.0)
	No opinion	18.3	2.6	3.6	3.1	3.4	0.04	3.6	(2.5-5.2)
	Base	17	44	298	312	154		825	

a – p value – results of the tests for heterogeneity of proportions or tests for trend in proportions (in italic) for particular categories according to birth cohort

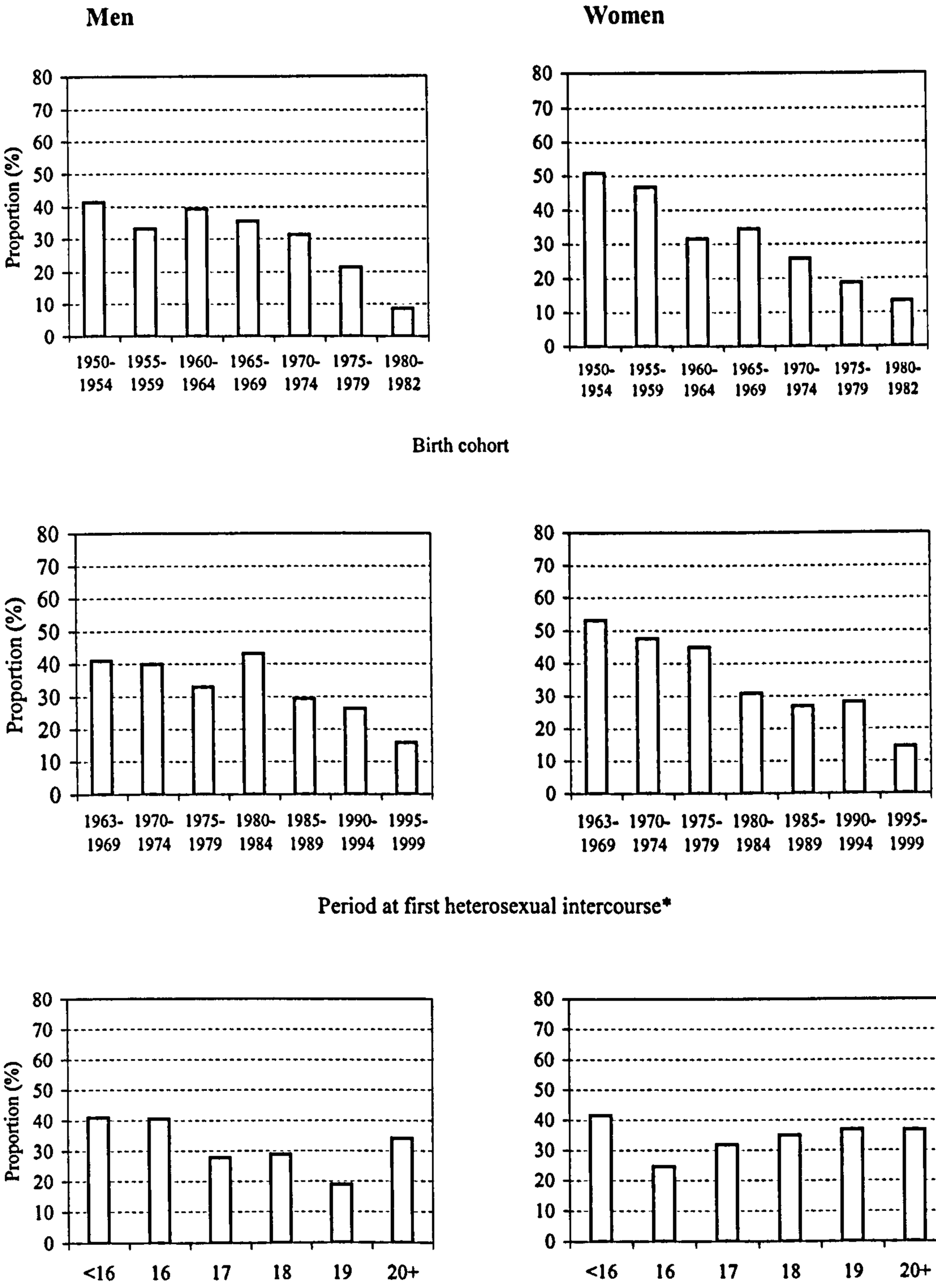
b – confidence interval

Methods for complex survey data (svy commands) in STATA were used to obtain weighted estimates. Whenever appropriate (gradually increasing or declining proportions), tests for trend were computed by fitting logistic regression models with age at first heterosexual intercourse (in given categories) fitted linearly. Four individuals who reported the first heterosexual intercourse at a younger age than first heterosexual experience were excluded from analyses.

5.4. Condom use and other contraceptive methods

5.4.1. Non-use of contraception

Overall, approximately one third of respondents, 31.7% (CI_{95} 28.2% - 35.5%) men and 33.7% (CI_{95} 30.1-37.5%) women reported not taking any precautions against the risk of pregnancy at FHI. However, non-use of contraception methods at FHI has declined substantially during recent decades and among those born more recently (Figure 5.6). Among the oldest respondents who were born during the early fifties (1950-1954), 41.4% men and 50.8% women reported not having used any contraceptive method and among the youngest, born during the very early eighties (1980-1982) only 8.6% men and 13.4% women (both genders $p_t<0.01$). Similarly, among those who experienced FHI during the early seventies (1970-1974), 39.9% men and 47.6% women reported not using any contraceptive method in comparison to only 15.8% men and 14.5% women who experienced the event during the late nineties (1995-1999) (both genders $p_t<0.01$). The decline in non-use of contraception at FHI was most substantial during the eighties and nineties, when AIDS awareness was increasing and safer sex, especially condom use was heavily promoted. As there is a strong relationship between birth cohort and



* Proportion of respondents not using contraception at first heterosexual intercourse (FHI) shown for different periods during which FHI occurred are not representative for everyone who had FHI during these periods. The estimates are most biased for the earliest and the most recent period.

Figure 5.6. Proportion of men and women who did not use any contraceptive method at first heterosexual intercourse (FHI) according to birth cohort, period during which FHI occurred and age at the event

period during which individuals experience FHI, there is a potential for strong confounding of these two effects.

The variation in non-use of contraceptive methods according to age at FHI is also shown in Figure 5.6. The highest proportion of men and women who did not take any precautions against pregnancy was among those with early FHI, before the age of 16, 40.9% among men and 41.5% among women. However, the difference in contraception non-use between those with early FHI and everyone else was statistically significant only for men ($p=0.05$). As there is also a relationship between age at FHI and birth cohort as well as the period during which FHI occurs, there is a potential for additional confounding between these three effects.

Men who reported not having planned FHI or not to have been in control during the event (carried away by their feelings or drunk), reported non-use of contraceptive methods more frequently ($p=0.05$, $p=0.01$). Such differences were not apparent among women. In contrast, non-use of contraception at FHI among women varied with whether they received information about sexual matters in school and with their education. Women who received information about sexual matters in school reported non-use of contraception less frequently as did those with higher than first stage secondary education ($p=0.05$, $p<0.01$). Such differences were not apparent among men. In addition, women with no religious affiliation reported non-use of contraception methods less frequently than those with Roman Catholic religious affiliation ($p=0.03$), which was not the case for men. Higher proportions of men and women who had their FHI with a non-steady partner reported not having used any precaution against pregnancy, but the differences were not statistically significant for either gender. Not living with both parents until the age of 15 and living in one of the two biggest Slovenian cities with more than 100,000 residents were not associated with non-use of contraception. The results of univariate analyses exploring the association of non-use of contraception at FHI with respondents' birth cohort, FHI period, age at FHI, respondents' social characteristics, some contextual factors at FHI, and with whether they received information about sexual matters in school are presented in Table A.5.7.

The results of multivariate analysis exploring joint effects of different factors on non-use of contraception at FHI together with the results of relevant univariate analyses are presented in Table 5.6. As expected, the strong relationship between birth cohort and period during which FHI occurred, the latter reflecting the cumulative effect of the years of exposure to AIDS awareness before FHI (correlation coefficients: 0.87 for men, 0.88 for women), resulted in strong mutual confounding of these two effects. Interestingly, among men the effect remained statistically significant in the multivariate model, while among women it was the effect of birth cohort. The more recently men experienced FHI, and were thus exposed to more years of AIDS

Table 5.6. Association of non-use of contraception at first heterosexual intercourse (FHI) with birth cohort, FHI period, early FHI, being in control at the event, and education for men and women (multivariate analysis)

	Non-use of contraception		Unadjusted		Adjusted[c]	
	%	Base	OR[a]	p value (95% CI[b])	OR[a]	p value (95% CI[b])
Men						
Year of birth (age[d])						
1950			1	p<0.01	1	p=0.82
For one year increase in year of birth (or decrease in age)			0.97	(0.95-0.98)	1.00	(0.97-1.04)
FHI[e] period						
<1986 (none/very low)			1	p<0.01	1	p<0.01
For one year increase after 1985 in years before FHI[e] occurred			0.90	(0.86-0.93)	0.89	(0.83-0.96)
Age at FHI[e]						
16+ years old	30.8	658	1	p=0.05	1	p=0.10
<16 years old (early FHI[e])	40.9	131	1.6	(1.0-2.4)	1.5	(0.9-2.3)
In control at FHI[e]						
Yes	30.6	686	1	p<0.01	1	p=0.02
No (carried away, drunk)	44.5	104	1.8	(1.2-2.8)	1.8	(1.1-2.8)
Education						
<1st stage secondary	32.7	98	1	p=0.52	1	p=0.19
1st or 2nd stage secondary	33.4	581	1.0	(0.6-1.7)	1.1	(0.7-1.9)
Recognised 3rd level	27.1	110	0.8	(0.4-1.5)	0.7	(0.4-1.3)
Women						
Year of birth (age[d])						
1950			1	p<0.01	1	p<0.01
For one year increase in year of birth (or decrease in age)			0.94	(0.92-0.96)	0.93	(0.90-0.97)
FHI[e] period						
<1986 (none/very low)			1	p<0.01	1	p=0.97
For one year increase after 1985 in years before FHI[e] occurred			0.88	(0.85-0.92)	1.00	(0.92-1.09)
Age at FHI[e]						
16+ years old	33.3	732	1	p=0.29	1	p=0.05
<16 years old (early FHI[e])	39.8	60	1.3	(0.8-2.2)	1.7	(1.0-2.9)
In control at FHI[e]						
Yes	33.8	727	1	p=0.90	1	p=0.65
No (carried away, drunk)	33.0	65	1.0	(0.6-1.7)	0.9	(0.5-1.6)
Education						
<1st stage secondary	32.7	98	1	p<0.01	1	p<0.01
1st or 2nd stage secondary	33.4	581	0.7	(0.4-0.9)	0.9	(0.6-1.4)
Recognised 3rd level	27.1	110	0.4	(0.2-0.6)	0.4	(0.3-0.7)

a – odds ratio
b – confidence interval
c – adjusted for all other variables in the table
d – approximate age at interview
e – first heterosexual intercourse

Methods for complex survey data (svy commands) in STATA were used to obtain weighted estimates of proportions and numbers of individuals. Logistic regression for survey data was used to compute pseudo-maximum likelihood estimates of odds ratios together with 95% CI and results of adjusted Wald tests for significance.
Only 789 men and 792 women with no missing values for any of the variables in the model were included into analyses.

awareness, the less likely they were not to use any contraceptive method at the event. For each year increase in the calendar year of FHI since 1985 the risk of non-use of contraception

decreased by approximately one tenth (adjusted OR 0.89; CI_{95} 0.83-0.96). Among women the risk of non-use of contraception at FHI decreased with increasing birth cohort or decreasing age at interview. For each year increase in calendar year of birth (decrease in age at interview) the risk of non-use of contraception decreased by slightly less than one tenth (adjusted OR 0.93; CI_{95} 0.90-0.97). The only additional risk factor for non-use of contraception at FHI for men was not being in control at FHI (carried away by feelings or drunk; adjusted OR 1.8; CI_{95} 1.1-2.8). The only additional risk factor for non-use of contraception at FHI for women was early intercourse (before the age of 16) (adjusted OR 1.7; CI_{95} 1.0-2.9). Higher education had a protective effect among women. Those with recognised third level education were at a more than two times lower risk for non-use of contraception than those who only had less than first stage secondary education (adjusted OR 0.4; CI_{95} 0.3-0.7)

5.4.2. Contraceptive methods

Use of some contraception method at FHI was reported by 66.3% (CI_{95} 62.4% - 69.7%) men and 65.5% (CI_{95} 61.7% - 69.0%) women. Of those, the great majority reported having used either withdrawal or condom. Withdrawal was reported by 29.0% (CI_{95} 25.6% - 32.5%) men and 30.6% (CI_{95} 27.2% - 34.3%) women. Condom use was reported by 23.6% (CI_{95} 20.7% - 26.8%) men and 21.3% (CI_{95} 18.6% - 24.2%) women. Condom use includes also its use in addition to the pill, reported by a small proportion of men (1.4%) and women (0.9%). The use of the pill at FHI, on its own and together with a condom, was reported much less frequently, by 9.1% (CI_{95} 7.1% - 11.6%) men and by 6.1% (CI_{95} 4.6% - 8.2%) women. This was the only contraceptive method for which the reported extent of use at FHI differed between men and women (p=0.04), women reporting pill use more frequently than men. Use of other contraception methods including assessing safe period was reported less frequently. Overall, very few respondents reported failure to recall contraceptive practices at FHI, more men (2.1%; CI_{95} 1.2% - 3.7%) than women (0.8%; CI_{95} 0.3% - 2.0%) (p=0.06).

Variation in non-use and use of different contraceptive methods between different birth cohorts of men and women and between different periods during which they experienced FHI is shown in Figure 5.7, Figure 5.8 and in Table A 5.8. Variation according to age at FHI is shown in Figure 5.9 and Table A 5.9. The increase in condom use at FHI during recent decades, among men and women born more recently, has been quite dramatic and will be described in detail in the next sub-chapter. In contrast to that, the use of all other contraceptive methods, except for the pill, has declined (Table A 5.8). The use of withdrawal declined most substantially. Among

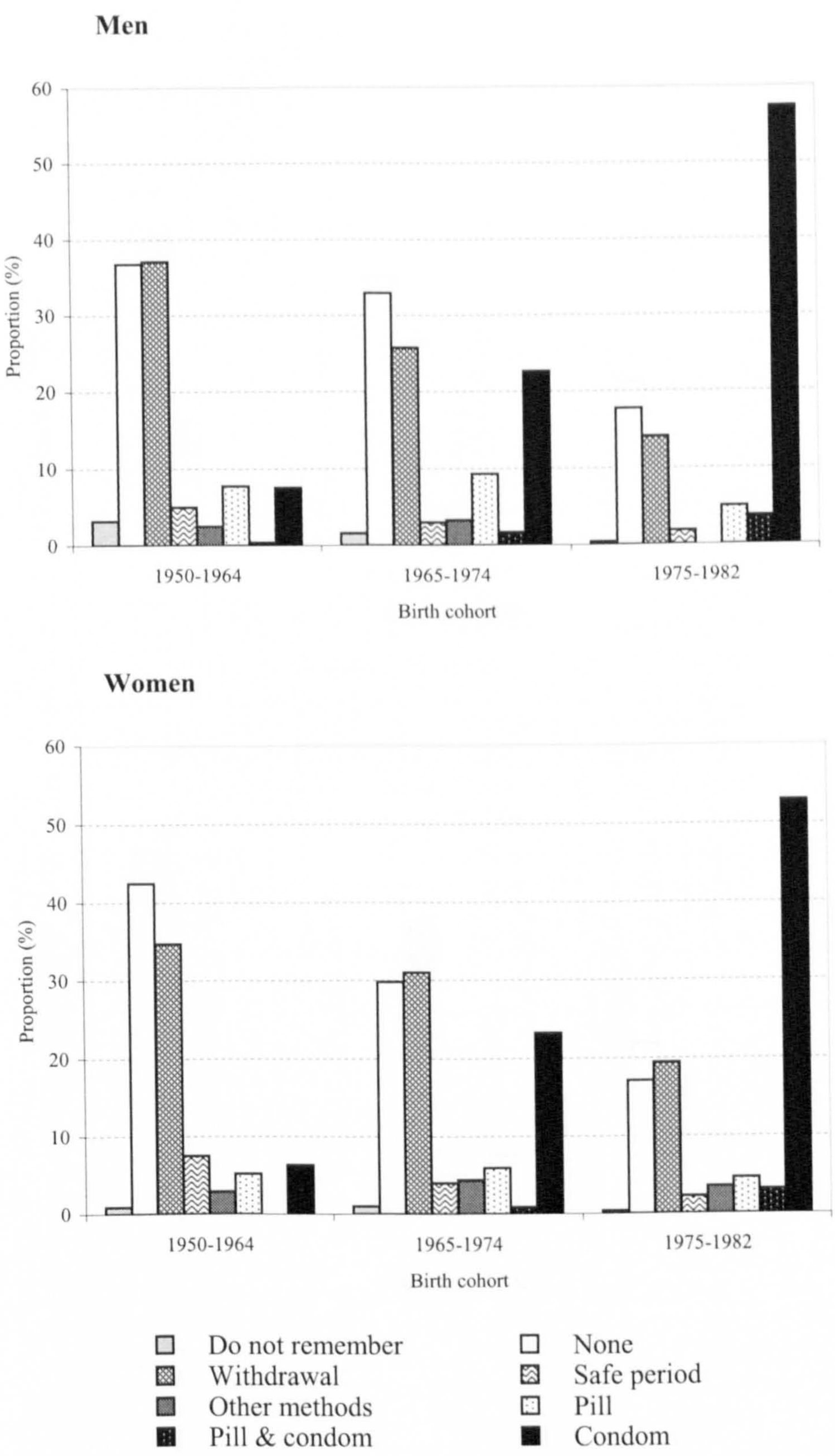


Figure 5.7. Contraceptive methods used by men and women at first heterosexual intercourse according to birth cohort

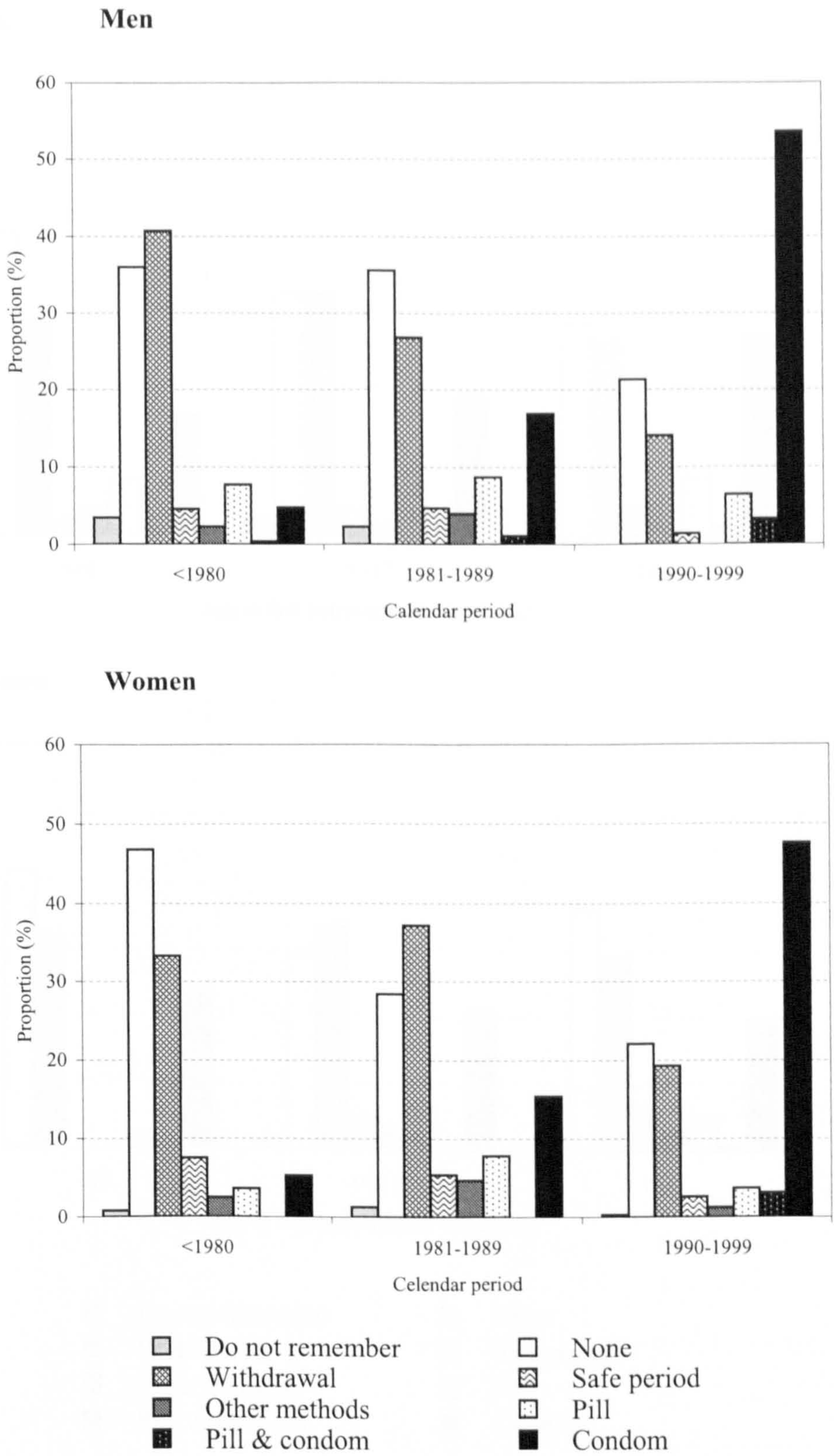


Figure 5.8. Contraceptive methods used by men and women at first heterosexual intercourse according to period during which the event occurred

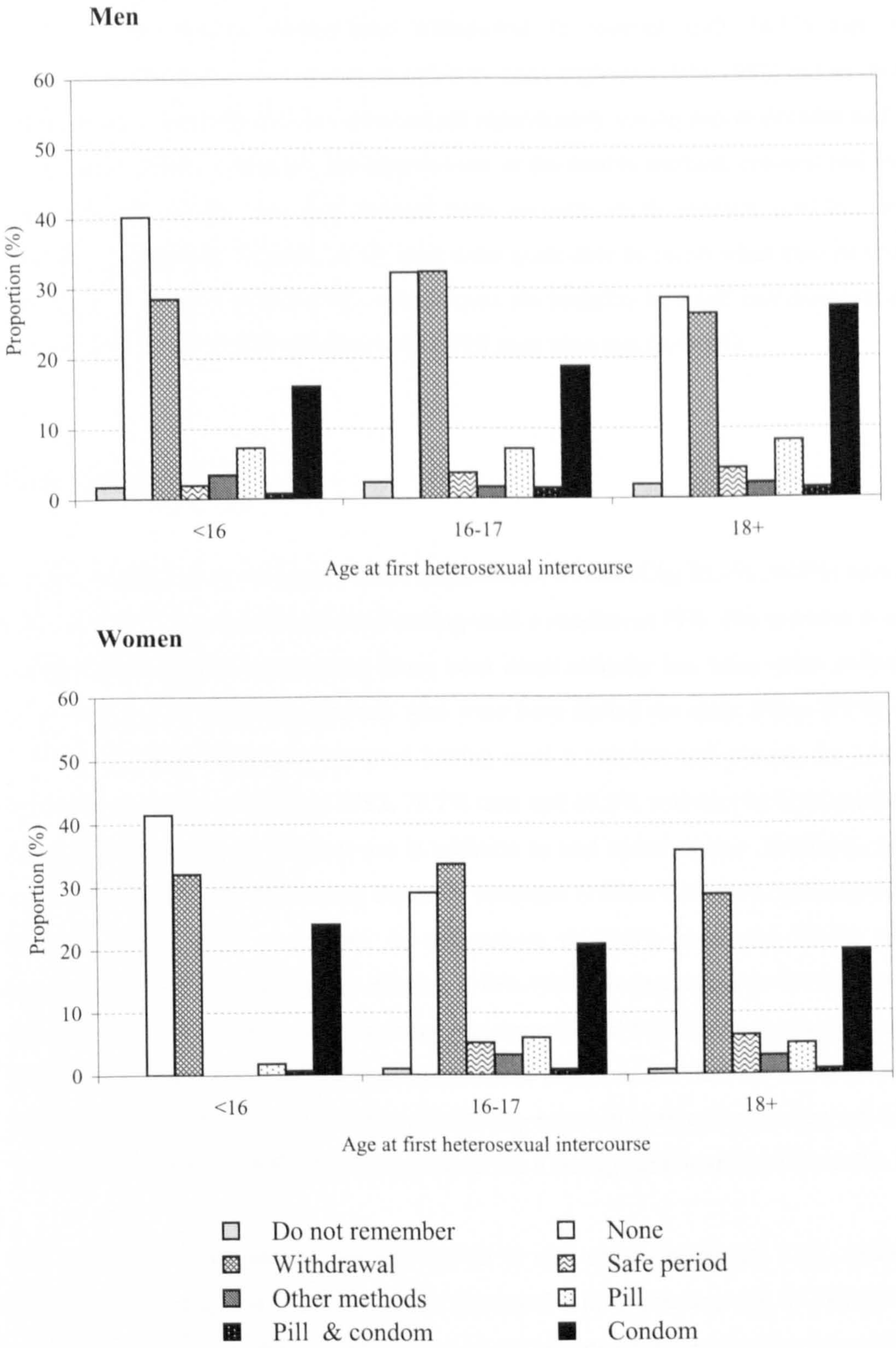


Figure 5.9. Contraceptive methods used by men and women at first heterosexual intercourse according to age at the event

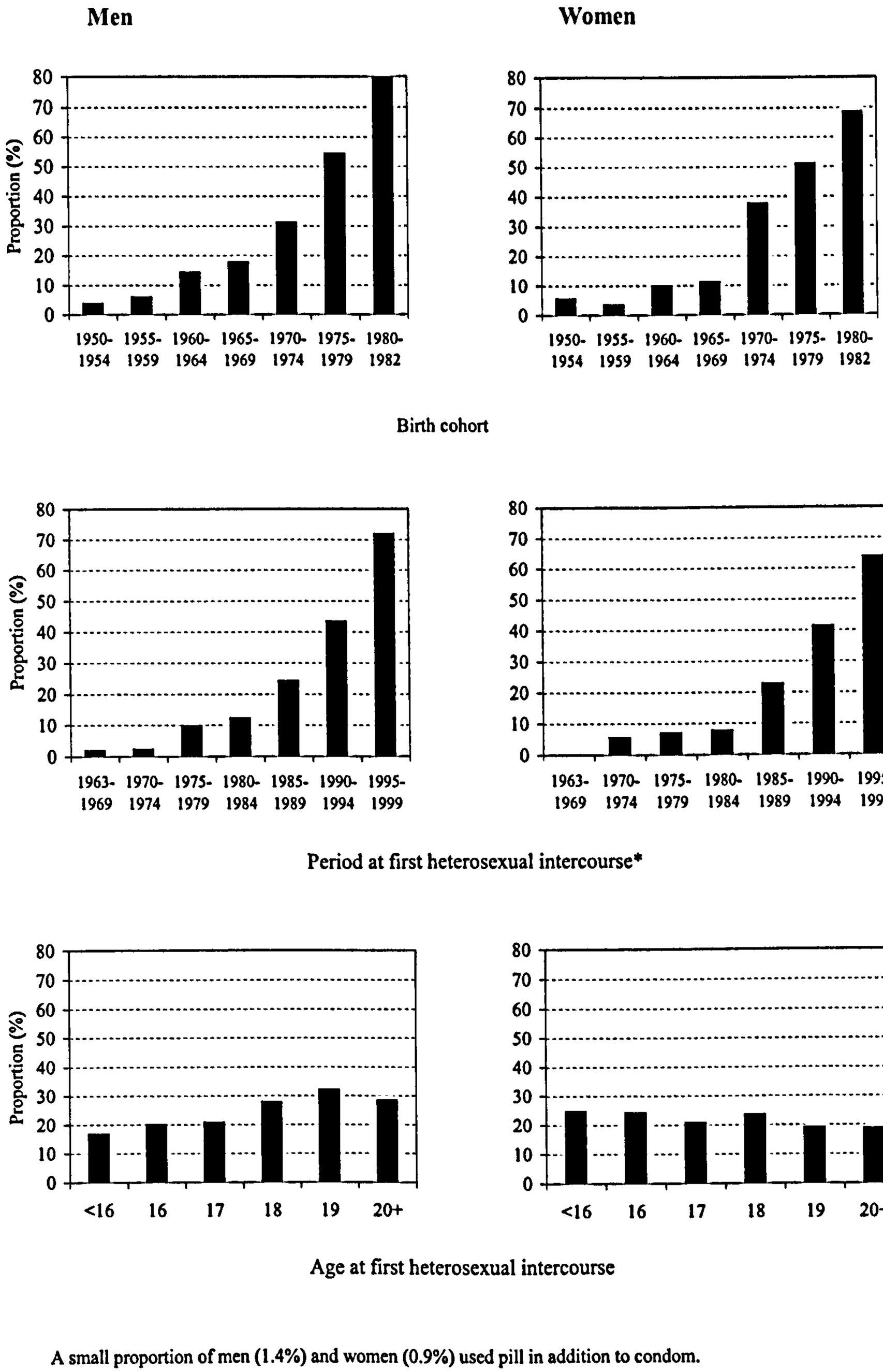
the oldest respondents, born during the fifties and early sixties (1950-1964), 37.1% men and 34.7% women reported having used withdrawal. In contrast, only 14.1% men and 19.4% women born during the late seventies and very early eighties (1975-1982) did so (both genders $p_t<0.01$). The use of the pill has not changed significantly during recent decades and with more recent birth cohorts. Although, the reported use of the double method, condom and pill together, has increased among men and women born recently (both genders $p_t<0.01$), it remained relatively uncommon. Women of all ages were quite able to recall what kind of contraceptive method, if at all, was used at FHI. Among men, the inability to recall contraceptive practices at FHI was higher among the oldest who had FHI long time ago ($p_t<0.01$).

5.4.3. Condom use

Overall, slightly more than one fifth of respondents, 23.6% (CI_{95} 20.7%-26.8%) men and 21.3% (CI_{95} 18.6%-24.2%) women reported having used a condom at FHI. The increase in condom use during recent decades and among those born more recently has been quite dramatic (Figure 5.10). Among the oldest respondents who were born during the early fifties (1950-1954), only 3.7% men and 5.6% women reported having used a condom and among the youngest, born during the period from 1980 to 1982, 79.7% men and 68.6% women (for both genders $p_t<0.01$). These estimates include condom use in addition to oral contraception. Similarly, among those who have experienced FHI during the early seventies (1970-1974) 2.2% men and 5.5% women reported having used a condom in comparison to 71.8% men and 63.8% women who experienced the event during late nineties (1995-1999) (both genders $p_t<0.01$). The increase in condom use was most steep among those who experienced FHI during the eighties and nineties, the period during which the effect of the years of exposure to AIDS awareness was increasing fast. Since there is obviously a strong relationship between birth cohort and period during which individuals experience FHI there is a potential for a strong confounding of these two effects.

The variation in condom use by age at FHI is also shown in Figure 5.10. Among men the proportion of those who used a condom increased with increasing age at FHI ($p<0.01$). Men who experienced early FHI (before the age of 16) reported condom use less frequently ($p=0.03$). There was no such pattern among women.

Both men and women who received information about sexual matters in school reported using condoms at FHI more frequently ($p<0.01$, $p=0.05$). Also, a higher proportion of men and women who had their FHI with a steady partner reported condom use, but the difference was



A small proportion of men (1.4%) and women (0.9%) used pill in addition to condom.

* Proportion of respondents using condom at first heterosexual intercourse (FHI) shown for different periods during which FHI occurred are not representative for everyone who had FHI during these periods. The estimates are most biased for the earliest and the most recent period.

Figure 5.10. Proportion of men and women who used condom at first heterosexual intercourse (FHI) according to birth cohort, period during which FHI occurred and age at the event

statistically significant only for men ($p<0.01$, $p=0.12$). Men and women who reported having planned FHI and those with higher education reported condom use more frequently, but the differences were not statistically significant. Not surprisingly, men and women who reported not being in control during the event (carried away by their feelings or drunk), reported condom use less frequently than others, but the difference was statistically significant only for men ($p<0.01$, $p=0.30$). In addition, men who did not live with both parents until the age of 15 reported condom use less frequently ($p=0.03$). Reported condom use did not differ between Roman Catholics and those without religious affiliation and between inhabitants of the two biggest Slovenian cities and those living in smaller communities. The results of univariate analyses exploring the association of condom use at FHI with respondents' birth cohort (current age), FHI period, early FHI, respondents' social characteristics, some contextual factors at FHI, and with whether they received information about sexual matters in school are presented in Table A 5.10.

The results of multivariate analysis exploring joint effects of different factors on condom use at FHI together with the results of relevant univariate analyses are presented in Table 5.7. In spite of the strong relationship between birth cohort and period during which FHI occurred, which resulted in some mutual confounding of these two effects, both remained statistically significant. The more recently the respondents were born and the more recently they experienced FHI (more years of exposure to AIDS awareness before FHI), the more likely they were to use a condom. For each year increase in the year of birth the likelihood of condom use increased by approximately one tenth (for men adjusted OR 1.08; CI_{95} 1.02-1.15 and for women adjusted OR 1.10; CI_{95} 1.03-1.17). And, for each year increase in the calendar year of FHI since 1985 the likelihood of condom use increased by even more than one tenth (for men adjusted OR 1.20; CI_{95} 1.08-1.33 and for women adjusted OR 1.13; CI_{95} 1.03-1.27). No additional protective factors for increased condom use or risk factors for non-use of condom at FHI were identified for women. In contrast, several protective factors as well as risk factors were identified for men. Men who received information about sexual matters in school were 1.5 times more likely to use a condom at FHI (adjusted OR 1.5; CI_{95} 1.0-2.4). Men with third level education were more than three times more likely to use a condom than those with less than first stage secondary education (adjusted OR 3.6; CI_{95} 1.5-8.5). Finally, men who had early FHI and those who were not in control at the event because they were carried away by feelings or because they were drunk, were half as likely to use condom (adjusted OR 0.5; CI_{95} 0.3-0.9 and 0.3; CI_{95} 0.1-0.6).

Table 5.7. Association of condom use at first heterosexual intercourse (FHI) with birth cohort, FHI period, early FHI, being in control at the event, receiving information about sex matters in school and education for men and women (multivariate analysis)

	Condom used		Unadjusted		Adjusted[c]	
	%	Base	OR[a]	p value (95% CI[b])	OR[a]	p value (95% CI[b])
Men						
Birth cohort in years (age[d])						
1950			1	p<0.01	1	p<0.01
For one year increase in year of birth (or decrease in age[d])			1.16	(1.13-1.19)	1.08	(1.02–1.15)
FHI[e] period						
<1986 (none/very low)			1	p<0.01	1	p<0.01
For one year increase after 1985 in years before FHI[e] occured			1.33	(1.27–1.38)	1.20	(1.08–1.32)
Age at FHI[e]						
16+ years old	24.5	672	1	p=0.04	1	p=0.03
<16 years old (early FHI[e])	16.7	133	0.6	(0.4 – 1.0)	0.5	(0.3 – 0.9)
In control at FHI[e]						
Yes	25.3	696	1	p<0.01	1	p<0.01
No (carried away, drunk)	9.6	110	0.3	(0.2 – 0.6)	0.3	(0.1 – 0.6)
Information about sex in school						
Not received	17.3	447	1	p<0.01	1	p=0.06
Received	30.6	358	2.1	(1.5 – 3.0)	1.5	(1.0 – 2.4)
Education						
<1st stage secondary	19.9	100	1	p=0.31	1	p<0.01
1st or 2nd stage secondary	22.7	589	1.2	(0.7 – 1.9)	0.9	(0.5 – 1.8)
Recognised 3rd level	28.8	116	1.6	(0.9 – 3.1)	3.6	(1.5 – 8.5)
Women						
Birth cohort in years (age[d])						
1950			1	p<0.01	1	p<0.01
For one year increase in year of birth (or decrease in age[d])			1.16	(1.13–1.20)	1.10	(1.03–1.17)
FHI[e] period						
<1986 (none/very low)			1	p<0.01	1	p=0.01
For one year increase after 1985 in years Before FHI[e] occured			1.31	(1.25–1.36)	1.13	(1.03–1.24)
Age at FHI[e]						
16+ years old	21.5	738	1	p=0.45	1	p=0.40
<16 years old (early FHI[e])	25.3	60	1.2	(0.7 – 2.2)	0.7	(0.4 – 1.5)
In control at FHI[e]						
Yes	22.3	732	1	p=0.29	1	p=0.47
No (carried away, drunk)	16.6	66	0.7	(0.4 – 1.4)	0.7	(0.3 – 1.7)
Information about sex in school						
Not received	18.2	356	1	p=0.03	1	p=0.41
Received	24.7	441	1.5	(1.0 – 2.1)	1.2	(0.8 – 1.8)
Education						
<1st stage secondary	14.9	147	1	p=0.09	1	p=0.14
1st or 2nd stage secondary	23.8	486	1.8	(1.1 – 3.0)	1.0	(0.5 – 1.9)
Recognised 3rd level	22.1	165	1.6	(0.9 – 2.9)	1.6	(0.8 – 3.3)

a – odds ratio
b – confidence interval
c – adjusted for all other variables in the table
d – approximate age at interview
e – first heterosexual intercourse

Methods for complex survey data (svy commands) in STATA were used to obtain weighted estimates of proportions and numbers of individuals. Logistic regression for survey data was used to compute pseudo-maximum likelihood estimates of odds ratios with 95% CI and results of adjusted Wald tests for significance.
Only 805 men and 797 women with no missing values for any of the variables in the model were included into analyses.

5.5. Knowledge about sexual matters and sources of information

Young people learn about sexual matters from numerous complementary sources (Table 5.8). The most common source for men and women alike is their peers (with the exception of first partners themselves), reported by 66.1% (CI_{95} 62.1%-69.8%) men and 61.2% (CI_{95} 57.5%-64.7%) women. This mostly involves friends and less frequently brothers and sisters. Except for peers, there are clear differences in the reported frequency of different sources of knowledge about sexual matters between genders. However, the predominant sources are the same. The second most commonly reported source for men and women alike was books, reported by 47.7% (CI_{95} 43.7%-51.6%) men and a higher 57.8% (CI_{95} 53.9%-61.5%) women. Many young people also gain their knowledge from their first partner, 45.5% (CI_{95} 41.8%-49.3%) men and a lower, 29.3% (CI_{95} 26.1%-32.7%) women. Another important source is school, reported by 45.1% (CI_{95} 41.2%-49.0%) men and a higher 55.2% (CI_{95} 51.4%-59.0%) women. School has clearly been making an increasingly important contribution to young people's sexual education. Among men born during 1950-1964, 38.0% reported having learned about sexual matters in school and among those born during 1975-1982 55.6% ($p_t<0.01$). Similarly, among women born during 1950-1964, 48.3% reported having learned about sexual matters in school and among those born during 1975-1982 already 59.3% ($p_t<0.01$). Parents, especially mothers, are another very important source, reported by 25.9% (CI_{95} 22.9%-29.3%) men and by many women, 50.3% (CI_{95} 46.7%-54.0%). Both mothers and fathers, have clearly become more willing to talk to their children about sex (both $p_t<0.05$) and parents have become the second most frequently reported source of information by the youngest generation of men and women (born during 1975-1982). The variation in proportions of reported sources of information about sexual matters between different birth cohorts of men and women is shown in Table 5.8.

The sources from which young people gain their knowledge about sexual matters have different relative importance. The most frequently reported as the most important source for men was peers (27.3%; CI_{95} 24.1%-30.8%) and for women parents (30.5%; CI_{95} 27.1%-34.1%), almost exclusively mothers (Table 5.8). The second most frequently reported most important source for men was the first partner (24.2%; CI_{95} 21.0%-27.7%), and for women peers (23.2%; CI_{95} 20.4%-26.2%). Table 5.8 shows the variation in proportions of reported most important sources of information about sexual matters between different birth cohorts of men and women.

At the time of their first heterosexual intercourse, approximately three quarters of young people perceived themselves as inadequately prepared in terms of information about sexual matters. "Should have known more" was reported by 76.3% (CI_{95} 72.4%-79.8%) men and 71.7% (CI_{95} 67.8%-75.3%) women. As might have been expected, this proportion has been declining among

Table 5.8. Reported and desired knowledge sources about sexual matters for men and women according to birth cohort (approximate age at interview)

	Men					Women				
	1950-1964 35-49 %	1965-1974 25-34 %	1975-1982 18-24 %	(p^a/ p_t^b)	All %	1950-1964 35-49 %	1965-1974 25-34 %	1975-1982 18-24 %	(p^a/ p_t^b)	All %
Learned about sex										
First partner	45.2	44.3	48.1	(0.71)	45.5	25.3	36.3	28.5	(0.01)	29.3
Peers (friends, siblings)	69.5	59.0	68.2	(0.03)	66.1	60.5	58.7	66.9	(0.24)	61.2
Books	49.5	49.4	40.5	(0.12)	47.7	56.3	63.4	52.6	(0.06)	57.8
Health institutions	3.9	12.0	20.5	*(<0.01)*	9.7	12.2	21.8	24.6	(<0.01)	17.6
Parents	19.2	31.5	34.1	*(<0.01)*	25.9	44.9	56.0	55.4	*(<0.00)*	50.3
Mother	14.7	28.7	29.5	(<0.01)	21.9	44.1	55.0	54.7	(0.02)	49.5
Father	9.4	15.8	17.1	(0.02)	12.9	4.4	6.2	10.2	(0.04)	6.1
School	38.0	49.7	55.6	*(<0.01)*	45.1	48.3	63.9	59.3	*(<0.01)*	55.2
Any other source[c]	55.8	64.8	70.1	(<0.01)	61.4	41.7	51.7	54.1	(<0.01)	47.2
Base	414	256	167		837	417	254	162		832
Main information source										
First partner	23.2	24.7	26.0	(0.75)	24.2	12.3	13.7	11.9	(0.79)	12.7
Peers (friends, siblings)	33.5	15.6	30.2	(<0.01)	27.3	24.1	22.4	22.2	(0.81)	23.2
Books	11.7	15.3	6.9	(0.04)	11.8	15.2	16.4	9.2	(0.08)	14.4
Health institutions	0.6	1.7	5.3	(0.01)	1.9	2.2	2.9	5.2	(0.18)	3.0
Parents	8.8	17.9	13.2	(0.01)	12.5	27.9	33.5	32.4	(0.30)	30.5
Mother	5.8	14.7	9.5	(<0.01)	9.3	27.0	32.5	32.1	(0.28)	29.7
Father	3.1	3.3	3.7	(0.92)	3.3	0.9	1.0	0.4	(0.73)	0.8
School	10.1	14.4	9.2	(0.16)	11.3	9.2	5.8	12.3	(0.06)	8.7
Any other source[c]	12.0	10.4	9.3	(0.61)	11.0	9.1	5.4	6.8	(0.15)	7.5
Base	407	255	166		827	412	254	160		825
Most desired source[d]										
First partner	14.4	21.1	21.9	(0.13)	18.0	3.7	5.6	11.3	(0.04)	5.6
Peers (friend, siblings)	11.5	8.8	14.8	(0.26)	11.3	7.9	13.8	13.7	(0.09)	10.7
Books	5.7	4.2	4.1	(0.70)	4.9	7.4	7.7	4.5	(0.52)	7.0
Health institutions	9.7	11.4	15.2	(0.29)	11.3	10.1	10.9	12.4	(0.54)	10.7
Parents	36.0	33.7	29.1	(0.44)	33.9	51.9	52.0	46.7	(0.62)	51.1
Mother	23.9	23.5	18.2	(0.45)	22.7	51.0	52.0	45.6	(0.54)	50.4
Father	12.1	10.2	10.9	(0.83)	11.2	0.9	0.0	1.1	(0.39)	0.7
School	17.2	16.7	11.5	(0.34)	15.9	15.0	9.4	8.5	(0.09)	12.2
Any other source[c]	5.4	4.1	3.5	(0.63)	4.6	4.0	0.7	2.9	(0.12)	2.8
Base[d]	291	191	114		596	288	169	93		550

a – p value for test of heterogeneity of proportions
b – p value for test for trend of proportions (in italic)
c – any other source included other relatives, television, radio, magazines or newspapers, and other unspecified sources
d – only individuals who reported that they should know more about sexual matters before first heterosexual intercourse were asked about the most desired source of information.

Methods for complex survey data (svy commands) in STATA were used to obtain weighted estimates. Whenever appropriate (gradually increasing or decreasing proportions), tests for trend were computed by fitting logistic regression models with cohort (in given categories) fitted linearly. Numbers of individuals (base) included into analyses vary according to the number of missing values for individual variables.

men and women born more recently. Among men born during 1950-1964, 78.6% reported lack of knowledge in comparison to 70.0% among those born during 1975-1982, and among women born during 1950-1964, 76.9% in comparison to 59.8% among those born during 1975-1982. This decline was significant only among women (pt<0.01). Surprisingly, a similar proportion of men and women who experienced early FHI felt that they should have known more about sexual matters as among those who experienced it at the age of 16 or later.

A sizeable proportion felt that they should had known more about contraception, 35.4% (CI_{95} 31.1%-40.0%) men and 47.7% (CI_{95} 43.7%-51.8%) women. In contrast, more men than women felt that they should had known more about sexually transmitted diseases, 47.7% (CI_{95} 43.3%-52.1%) men and 40.6% (CI_{95} 36.5%-44.8%) women. Few felt that they should know more about condom use negotiation, 14.1% (CI_{95} 11.2%-17.6%) men and 10.0% (CI_{95} 7.7%-12.8%) women.

Among men and women, who claimed not to have sufficient information at the time of their FHI, many would have liked to have learned more from more authoritative sources like parents, school and health care institutions. By far the biggest proportion would have liked to learn more from their parents, 33.9% (CI_{95} 29.5%-38.7%) men and 51.1% (CI_{95} 46.6%-55.5%) women. Sexual education in school was the third most preferred option for men (15.9%; CI_{95} 13.0%-19.5%) and the second most preferred option for women (12.2%; CI_{95} 9.6%-15.4%). Many people would want to learn more about sexual matters in health care institutions, 11.3% (CI_{95} 8.7%-14.4%) men (fourth most preferred source) and 10.7% (CI_{95} 8.0%-14.2%) women (third most preferred source). These views did not vary with age of respondents (Table 5.8).

5.6. Summary

Men have been experiencing first heterosexual intercourse (FHI) at slightly younger ages than women. Overall, the median age at FHI was 17 years for men and 18 years for women. Among both men and women born most recently it declined from 18 years to 17 years. This decline occurred earlier for men (among those born during the late sixties) than for women (among those born during the late seventies). With the most recent birth cohort born, during the late seventies and early eighties, the gender gap in the age at FHI seems to have closed completely. A sizeable minority of young people became sexually active before the age of 16, overall more men than women. However, the recent increase in the proportion of women experiencing early FHI resulted in the closure of the gender gap. Young men who did not live with both biological parents until the age of 15 were at increased risk for early FHI. The risk was higher also for women who reached their physical sexual maturity before the age of 13 and for women who lived in one of the two biggest cities. Higher education and acquiring most of the knowledge about sexual matters from parents or school had a protective effect against early FHI among women.

Men's first partners tended to be of approximately the same age as men themselves and more often virgins than women's first partners. Older first partner was the norm for women. It was extremely rare to have FHI within marriage, or with someone to whom the marriage was planned. In fact, pre-marital sex has become universal among those born most recently. The majority of people had FHI with someone they had known for some time but with whom they did not have an established relationship. Fewer reported FHI to have occurred within a steady relationship. It was more common among men than women to have FHI with someone they had just met or had met only recently, but FHI with a prostitute was very rare. For almost one in two men and approximately one in three women the event was neither planned nor anticipated, but just happened on the spur of the moment. More planning and less spontaneity appears to be associated with FHI for individuals born more recently. Not surprisingly, planning has been reported more frequently by individuals who experienced FHI at an older age, especially by women.

Differences in the most important contextual circumstances that lead men and women to experience FHI were quite striking. Among men, curiosity was reported most frequently and among women, being in love. For a sizeable proportion of respondents, but fewer men than women, FHI occurred within the context of natural development of their relationship. Social pressure from peers, desire to lose virginity, and being drunk were rarely reported. The earlier men and women experienced FHI the higher the proportion of those citing curiosity as the most

important triggering factor related to the event. Not surprisingly, regardless of the gender, the older the respondents were, the higher the proportion for whom FHI occurred within the context of natural development of a relationship.

Approximately one third of respondents reported not having taken any precautions against the risk of conception. However, non-use of contraception has declined substantially, especially during the eighties and nineties, when AIDS awareness was increasing and safer sex, especially condom use, was heavily promoted. Among the oldest respondents who were born during the early fifties approximately one in two reported not using any contraceptive method and among the youngest born during the very early eighties only approximately one in ten. Men who were not in control because of being carried away by feelings or drunk and women who had early FHI were at a higher risk for not using any contraception. Higher education had a protective effect among women.

Of those who used some contraceptive method, the great majority used either withdrawal or the condom. Slightly more than one in five respondents used a condom. However, the increase in its use among those who experienced FHI during the eighties and nineties has been quite striking. Among the youngest men and women (born during 1980-1982) more than two in three used a condom at FHI. Men who received information about sexual matters in school and those with higher education were more likely to use a condom and those who had early FHI or were not in control at the event less likely. In contrast to the increase in condom use, the use of withdrawal declined substantially with time. The use of the pill on its own or with a condom was less frequent and has not changed much during recent decades. The use of the double method, condom and pill together, has remained relatively uncommon, but has increased slightly among both men and women born most recently.

The great majority of respondents, recall their FHI as an event that was wished for and well timed. However, quite a sizeable minority of women reported that they had to be persuaded. Not surprisingly, the younger people were when FHI happened, the more likely they regretted the event. Among those with FHI before the age of 16, approximately one in two women and almost one in five men regretted it. In general, coercion at FHI was rare, but it is of concern that especially very young women, before even reaching the age of consent, were forced more frequently.

Young people learn about sex from numerous complementary sources. The two most common sources for men and women alike were their friends and books. For most men their friends were also the most important source, but for most women, it was their mothers. It is worrying that

approximately three in four young people perceived themselves as inadequately prepared in terms of information about matters related to sex at the time of their FHI. Among those, approximately one in three men and one in two women felt that they had lacked knowledge about contraception and almost one in two men and approximately one in three women about sexually transmitted diseases. Most would have liked to learn more from their parents, but many also from other more authoritative sources like school and health care institutions.

6. Sexual partnerships, practices, and HIV risk behaviours

6.1. Heterosexual partnerships, practices, and HIV risk behaviours

6.1.1. Numbers of partners

Table 6.1 shows the distribution of reported numbers of heterosexual partners ever (so far during the lifetime), in the past five years, and in the past year, stratified by gender and birth cohort (age group at interview). The variability in the reported numbers of partners between individuals of different ages and between men and women is quite striking. Men of all ages consistently reported higher numbers of heterosexual partners than women over all time periods. This gender heterogeneity was statistically significant ($p<0.01$) for all birth cohorts and all time periods.

While 20.5% (CI_{95}17.7%-23.6%) of men and approximately twice as many women, 42.2% (CI_{95}38.6%-45.8%), reported no or only one heterosexual partner ever, at the other end of the scale, 1% of men reported 58 or more and 1% of women 20 or more. The maximum reported number of lifetime heterosexual partners was 200 among men and 35 among women. The skewed nature of the distribution is emphasised by this high value of the 99th percentile compared with the median number of lifetime heterosexual partners (four for men, two for women). Correspondingly, the means (8.3 for men, 3.2 for women) and the standard deviations are strongly influenced by those reporting a very high number of heterosexual partners and are thus less appropriate summary measures. At least ten heterosexual partners ever was reported by 27.7% (CI_{95} 24.4%-31.2%) of men and far fewer women, 5.6% (CI_{95} 3.0%-8.2%).

As expected, the two earlier cohorts of men (born during 1950-1964 and 1965-1974) had accumulated higher numbers of lifetime heterosexual partners (both medians 5, means 9.4, 8.2) in comparison to the most recent cohort (1975-1982) (median 3, mean 6.5), as the youngest individuals had less time to acquire many partners. Corresponding differences between respective cohorts of women were smaller (all three medians 2, means from the earliest to the most recent cohort 3.1, 3.4, 2.9).

For the partners during the past five years, the majority of respondents reported one heterosexual partner, although fewer men (52.6%; CI_{95} 48.9%-56.2%) than women (73.5%; CI_{95} 70.4%-76.5%). No heterosexual partners for the same period was reported by 6.5% (CI_{95} 5.0%-8.4%) of men and 5.2% (CI_{95} 4.0%-6.8%) of women. At the other end of the scale, the maximum reported number was 200 for men and 30 for women and 1% of men reported 30 or

Table 6.1. Distribution of reported numbers of heterosexual partners over lifetime, in the past 5 years, and in the past year for men and women by birth cohort (age at interview)

	Men				Women			
	Birth cohort (age[a])				Birth cohort (age[a])			
	1950-1964 (35-49)	1965-1974 (25-34)	1975-1982 (18-24)	All	1950-1964 (35-49)	1965-1974 (25-34)	1975-1982 (18-24)	All
Lifetime								
0	1.0%	2.9%	15.1%	4.9%	0.2%	1.4%	14.4%	3.7%
1	14.4%	14.0%	16.2%	15.6%	45.0%	33.3%	31.2%	38.5%
2	10.4%	8.1%	10.4%	9.7%	14.7%	17.4%	16.5%	15.9%
3-4	19.9%	22.2%	21.4%	21.0%	20.5%	23.2%	20.3%	21.3%
5-9	21.1%	23.9%	17.8%	21.1%	13.3%	19.9%	12.7%	15.2%
10+	31.3%	28.9%	19.1%	27.7%	6.3%	4.8%	5.0%	5.6%
Mean[b]	9.4	8.2	6.5	8.3	3.1	3.4	2.9	3.2
SD[c]	13.0	11.7	14.2	12.9	3.6	3.5	3.8	3.6
Median	5	5	3	4	2	2	2	2
99[th] percentile	60	58	45	58	20	15	22	20
Base (100%)	389	251	196	837	407	252	184	844
Past 5 years								
0	3.0%	4.8%	15.7%	6.5%	2.6%	2.9%	14.4%	5.2%
1	69.1%	52.2%	19.7%	52.6%	89.2%	76.6%	32.2%	73.5%
2	8.5%	10.1%	10.3%	9.4%	5.6%	9.4%	19.8%	9.8%
3-4	10.0%	13.0%	23.0%	14.0%	2.6%	6.6%	17.6%	7.0%
5-9	5.1%	13.3%	17.6%	10.5%	0.0%	4.6%	10.2%	3.6%
10+	4.3%	6.6%	13.7%	7.2%	0.0%	0.0%	3.8%	0.8%
Mean[b]	2.1	3.2	5.4	3.2	1.1	1.4	2.5	1.5
SD[c]	3.1	4.7	13.2	7.3	0.5	1.1	3.3	1.8
Median	1	1	3	1	1	1	2	1
99[th] percentile	15	30	38	30	4	5	16	8
Base (100%)	395	251	196	842	413	254	184	851
Past year								
0	4.5%	9.3%	22.9%	10.2%	5.9%	5.3%	19.2%	8.6%
1	78.4%	69.6%	45.3%	68.1%	92.0%	89.6%	62.1%	84.8%
2	10.9%	11.7%	11.9%	11.3%	1.5%	4.1%	11.6%	4.5%
3-4	5.7%	7.3%	12.7%	7.8%	0.6%	1.0%	4.9%	1.7%
5-9	0.3%	1.8%	5.7%	2.0%	0.0%	0.0%	2.2%	0.5%
10+	0.3%	0.5%	1.5%	0.6%	0.0%	0.0%	0.0%	0.0%
Mean[b]	1.2	1.4	1.8	1.4	1.0	1.0	1.1	1.0
SD[c]	0.8	1.3	3.7	2.0	0.3	0.4	1.0	0.6
Median	1	1	1	1	1	1	1	1
99[th] percentile	4	7	10	8	2	2	5	3
Base (100%)	394	250	195	840	413	255	187	855

a - approximate age at interview
b - mean is not the most appropriate summary measure as the distribution is skewed
c - standard deviation

Methods for complex survey data (svy commands) in STATA were used to obtain weighted estimates. Numbers of individuals (base) included in analyses vary according to the number of missing values for individual variables.

more and 1% of women eight or more. The median and mean numbers of heterosexual partners in the past five years were 1 and 3.2 for men and 1 and 1.5 for women. At least five heterosexual partners during the past five years were reported by 17.2% (CI_{95} 14.9%-20.7%) of men and 4.4% (CI_{95} 3.4%-5.8%) of women.

Not surprisingly, the younger the respondent, the higher the reported numbers of heterosexual partners, during the past five years. For the most recently born cohort of men (during 1975-

1982) the median and mean numbers of heterosexual partners were 3 and 5.4 and for the two earlier cohorts (born during 1950-1964 and 1965-1974) 1 and 3.2 and 1 and 2.1 respectively. Corresponding differences between respective cohorts of women were smaller (from the most recently born cohort to the earliest cohort, medians 2, 1, 1 and means 2.5, 1.4, 1.1). Among men, five or more female partners were reported by 31.4% (CI_{95} 26.4%-36.8%) and 19.9% (CI_{95} 14.8%-26.2%) of those born during 1975-1982 and 1965-1974 and 9.4% (CI_{95} 6.6%-13.2%) of those born during 1950-1964. Among women, five or more male partners in the past five years was reported by 14.0% (CI_{95} 10.5%-18.5%) of those born during 1975-1982, 4.6% (CI_{95} 2.5%-8.3%) of those born during 1965-1974 and none of women born during 1950-1964.

The great majority of respondents reported one heterosexual partner in the past year; again, fewer men (68.1%; CI_{95} 64.6%-71.4%) than women (84.8%; CI_{95} 82.2%-87.0%) did so. No heterosexual partner for the same period was reported by 10.2% (CI_{95} 8.3%-12.4%) of men and 8.6% (CI_{95} 6.8%-10.8%) of women. At the other end of the scale, the maximum reported number was 55 for men and 6 for women, and the 1% of men and women with most active sexual lifestyles reported eight or more and three or more heterosexual partners, respectively. The median and mean numbers of heterosexual partners were 1 and 1.4 for men and 1 and 1.0 for women. Two or more heterosexual partners during the past years were reported by 21.8% (CI_{95} 18.8%-25.0%) of men and 6.6% (CI_{95} 5.2%-8.4%) of women.

The younger the male respondent, the higher the reported numbers of female partners in the past year. For the most recent cohort of men (born during 1975-1982) the median and mean numbers of female partners were 1 and 1.8 and for the two earlier cohorts (born during 1950-1964 and 1965-1974) 1 and 1.4 and 1 and 1.2 respectively. There were almost no differences between respective cohorts of women (from the most recently born cohort to the earliest cohort, all medians 1 and means 1.1, 1.0, 1.0). Among men, two or more female partners were reported by 31.8% (CI_{95} 27.1%-36.9%) of those born during 1975-1982 and 21.2% (CI_{95} 15.9%-27.8%) and 17.2% (CI_{95} 13.3%-21.9%) of those born during 1965-1974 and 1950-1964. Among women, two or more male partners in the past year was reported by 18.7% (CI_{95} 14.5%-23.8%) of those born during 1975-1982, 5.1% (CI_{95} 2.8%-9.0%) of those born during 1965-1974 and only 2.1% (CI_{95} 1.1%-4.3%) of women born during 1950-1964.

Figure 6.1 shows the distribution of reported numbers of heterosexual partners in the past year stratified by gender and marital status. More details are shown in Table A 6.1. Irrespective of marital status, men consistently reported higher numbers of heterosexual partners than women. This heterogeneity between genders was statistically significant ($p<0.01$) for those who were married or cohabitating, and previously married (separated, divorced or widowed). For the latter

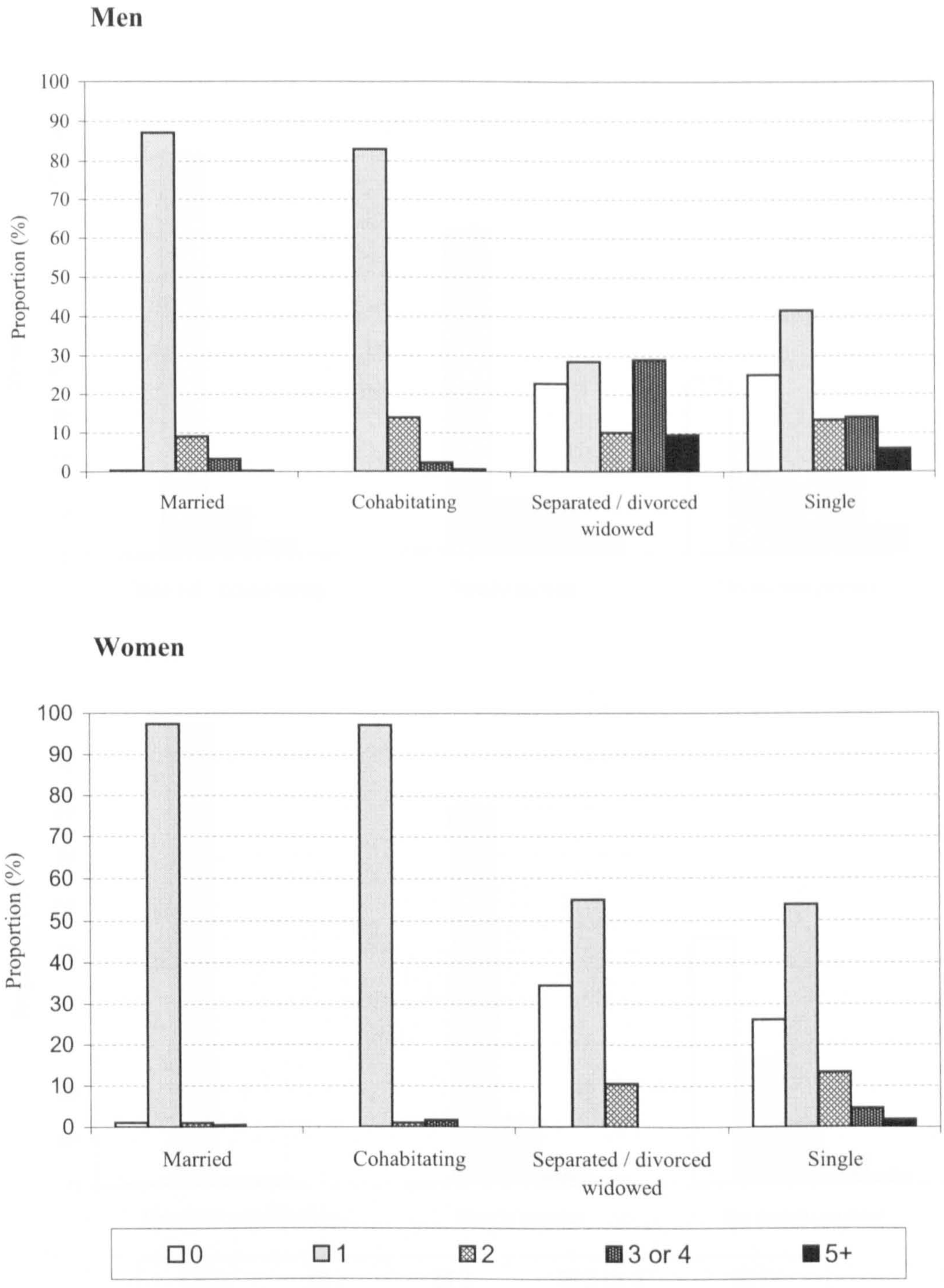


Figure 6.1. Numbers of heterosexual partners in the past year for men and women according to marital status

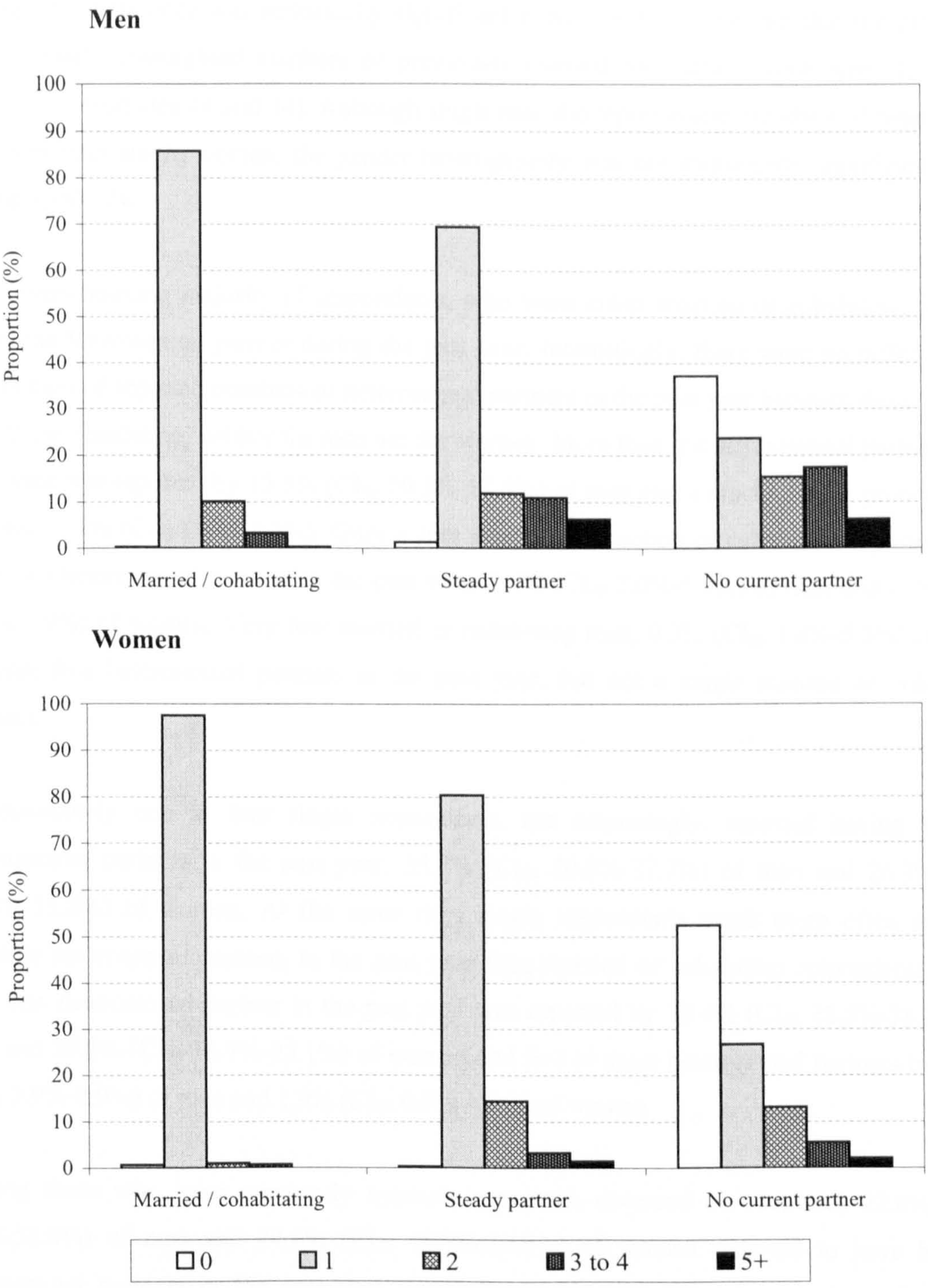


Figure 6.2. Numbers of heterosexual partners in the past year for men and women according to current partnership status

group this difference was statistically significant even in spite of the fact that the group was quite small. Unweighted numbers of previously married men and women were 12 and 27 (weighted estimates 14 and 34). Although single men did report higher numbers of heterosexual partners than single women, the gender heterogeneity was not statistically significant in this group (p=0.17).

The overwhelming majority of respondents, who were either married or cohabiting, reported only one heterosexual partner during the past year. Interestingly, there were no differences in the pattern of reported numbers of heterosexual partners in the past year between those married and those cohabiting, neither for men nor for women. More than one heterosexual partner in the past year was reported by 13.5% (CI_{95} 10.3%-17.5%) of men and a much smaller proportion of women, 1.7% (CI_{95} 0.9%-3.2%). Only a tiny fraction of married or cohabiting reported more than two heterosexual partners in the past year, 3.4% (CI_{95} 2.0%-5.8%) of men and 0.7% (CI_{95} 0.3%-1.9%) of women. Very few married or cohabiting men, 0.3% (CI_{95} 1.8%-5.3%) reported at least five heterosexual partners in the past year, but not a single married or cohabiting woman.

Approximately one in four single respondents, not surprisingly, reported having had no heterosexual partners in the past year, 25.0% (CI_{95} 20.8%-27.7%) of men and 26.3% (CI_{95} 21.4%-31.8%) of women. At the same time single respondents much more often reported multiple heterosexual partners in the past year than married or cohabiting respondents. More than one heterosexual partner in the past year was reported by 33.4% (CI_{95} 28.5%-38.7%) of men and 20.0% (CI_{95} 15.7%-25.1%) of women and five or more heterosexual partners by 5.9% (CI_{95} 3.9%-8.9%) of men and 1.9% (CI_{95} 0.9%-4.0%) of women.

Among those who were previously married (separated, divorced or widowed) 22.8% (CI_{95} 5.8%-58.8%) of men and 34.6% (CI_{95} 18.7%-54.9%) of women reported to have had no heterosexual partners in the past year. Interestingly for men this proportion was lower in comparison to single men and for women higher in comparison to single women. At least two heterosexual partners were reported by 48.6% (CI_{95} 21.4%-76.7%) of men and 10.5% (CI_{95} 3.5%-27.4%) of women. Interestingly, not a single previously married woman reported more than two heterosexual partners in the past year, while 38.5% (CI_{95} 15.0%-69.0%) of previously married men reported more than two and 9.5% (CI_{95} 1.3%-45.8%) five or more. However, as the group was very small, all these estimates are very imprecise.

Additional insight into reported numbers of heterosexual partners in the past year among single and previously married men and women according to whether they were in a steady

heterosexual relationship at the time of the survey or not is provided in Figure 6.2 and Table A 6.2.

6.1.2. Individuals with multiple partners

Having had multiple (two or more) heterosexual partners in the past year, was reported by 21.8% (CI_{95} 18.8%-25.0%) of men and by approximately three times fewer women, 6.6% (CI_{95} 5.2%-8.4%). The results of univariate analysis exploring the association of having had multiple heterosexual partners in the past year with birth cohort (age group), marital status and whether in a heterosexual relationship at the time of the survey, education, religious affiliation and early intercourse are presented in Table A 6.3.

As already described in the previous sub-chapter, irrespective of gender, the proportion with multiple heterosexual partners in the past year was the highest among the youngest respondents ($p<0.01$). The proportion of individuals with multiple heterosexual partners in the past year also varied substantially with marital status. Single and previously married men and women, quite expectedly, reported multiple heterosexual partners in the past year more frequently (men 33.4%, 48.6%, women 20.0%, 10.5%) than those married or in cohabitation (men 13.5%, women 1.7%) (both $p<0.01$). Also, single or previously married men, who were at the time of the survey in a stable relationship, less frequently reported having had multiple female partners in the past year (29.2%) than those who were not in a relationship (39.1%) ($p=0.03$). In contrast no such differences were observed among single and previously married women. Regardless of being in a stable relationship at the time of the survey or not, one in five among previously married women reported multiple male partners in the past year (19.2%, 20.8%).

Men with second stage secondary or third level education reported multiple female partners in the past year more frequently than those with lower education (26.0%, 25.8%, 16.6%) ($p=0.01$). Among women, the proportion of those with multiple male partners was highest among those with the secondary stage education, followed by those with less than secondary stage education and those with third level education (8.8%, 5.7%, 4.0%), but differences were not statistically significant. Men and women alike reported multiple heterosexual partners in the past year more frequently, if they had no religious affiliation (28.1%, 8.9%) in comparison to Roman Catholics (18.8%, 5.8%), but for women, this difference was not statistically significant. Finally, both men and women, who had experienced early first heterosexual intercourse (before the age of 16), reported multiple heterosexual partners in the past year more frequently than others (34.4%, 18.5% in comparison to 19.6%, 5.6%) (both $p<0.01$).

The results of multivariate analysis exploring joint effects of these demographic and social characteristics and the effect of early intercourse on the likelihood of having had multiple heterosexual partners in the past year together with results of relevant univariate analyses are presented in Table 6.2. Neither for men nor for women was the age group at interview remained significantly associated with multiple heterosexual partners in the past year. Not surprisingly, most recent sexual behaviour was strongly influenced by current marital status. Among men and women alike, single or previously married respondents were much more likely to have had multiple heterosexual partners in the past year than those who were married or in cohabitation. However, interestingly, for men and women alike, the increase in this likelihood was quite similar for those, who were, at the time of the survey, in stable relationships, and for those who were not. Among single or previously married men, those in stable relationships were approximately three times more likely to have had multiple female partners in the past year than men who were married or in cohabitation (adjusted OR 3.0; CI_{95} 1.6-5.4), and those not in relationships, approximately five times more likely (adjusted OR 4.9; CI_{95} 2.8-8.4). Similarly, among single or previously married women, both, those in stable relationships and those not, were nine times more likely to have had multiple male partners in the past year (adjusted ORs 9.0 (CI_{95} 4.0-20.1) and 9.1 (CI_{95} 3.9-21.3) respectively). In addition, men and women alike were more likely to have had multiple heterosexual partners in the past year, if they had experienced early first heterosexual intercourse (before the age of 16). The likelihood was approximately four times higher for men (adjusted OR 3.8; CI_{95} 1.5-3.7) and approximately three times higher for women (adjusted OR 3.2; CI_{95} 1.6-6.4). There was some borderline evidence, that men without religious affiliation could be slightly more likely to have multiple heterosexual partners in the past year than Roman Catholics (adjusted OR 1.5; CI_{95} 1.0-2.3; p=0.06). This was not so for women.

A sizeable minority of individuals, greater among men than women, accumulate rather high numbers of heterosexual partners during the course of their lifetime. More than 10 heterosexual partners ever was reported by 27.7% (CI_{95} 24.4%-31.2%) of men and 5.6% (CI_{95} 3.0%-8.2%) of women. The results of univariate analysis exploring the association of having had ten or more heterosexual partners ever with respondents' birth cohort (age group), marital status, education, religious affiliation and early intercourse are presented in Table A 6.4.

Again, as already described in the previous sub-chapter, irrespective of gender, the proportion of those reporting ten or more heterosexual partners ever was higher among the oldest respondents than among the youngest, as they had more time to accumulate many partners. However, the proportion of those reporting ten or more male partners among the youngest women (born

Table 6.2. Association of multiple heterosexual partners (2 or more) in the past year with birth cohort, partnership status, religious affiliation, and early first heterosexual intercourse for men and women (multivariate analysis)

		2+ partners[a]		Unadjusted		Adjusted[d]	
		%	Base	OR[b]	p value (95% CI[c])	OR[b]	p value (95% CI[c])
Men							
	Birth cohort (age[e])						
	1950-1964 (35-49)	17.3	359	1	p<0.01	1	p=0.51
	1965-1974 (25-34)	22.9	231	1.4	0.9-2.3)	0.9	0.5-1.5)
	1975-1982 (18-24)	30.4	182	2.1	(1.4-3.1)	0.7	(0.4-1.3)
	Current partnership status						
	Married/cohabitation	13.7	463	1	p<0.01	1	p<0.01
	Steady partner[a] (not cohabitation)	29.0	136	2.6	(1.6-4.2)	3.0	(1.6-5.4)
	No partner[a] currently	39.0	174	4.0	(2.7-6.1)	4.9	(2.8-8.4)
	Religious affiliation						
	Roman catholic	19.2	537	1	p=0.02	1	p=0.06
	None	28.5	236	1.7	(1.1-2.5)	1.5	(1.0-2.3)
	Early FHI[f] (before age 16)						
	No	19.8	659	1	p<0.01	1	p<0.01
	Yes	35.1	112	2.2	(1.4-3.4)	3.8	(1.5-3.7)
Women							
	Birth cohort (age[e])						
	1950-1964 (35-49)	2.1	374	1	p<0.01	1	p=0.16
	1965-1974 (25-34)	4.9	241	2.4	(0.9-6.5)	1.6	(0.6-4.5)
	1975-1982 (18-24)	19.2	179	11.1	(4.8-25.4)	2.3	(1.0-5.5)
	Current partnership status						
	Married/cohabitation	1.7	574	1	p<0.01	1	p<0.01
	Steady partner[a] (not cohabitation)	19.7	124	13.9	(6.4-30.1)	9.0	(4.0-20.1)
	No partner[a] currently	20.4	96	14.5	(6.5-32.1)	9.1	(3.9-21.3)
	Religious affiliation						
	Roman catholic	5.7	545	1	p=0.06	1	p=0.39
	None	9.1	248	1.7	(1.1-2.8)	1.3	(0.7-2.3)
	Early FHI[f] (before age 16)						
	No	5.8	734	1	p<0.01	1	p<0.01
	Yes	19.7	59	4.0	(2.3-7.1)	3.2	(1.6-6.4)

a – heterosexual partners only
b – odds ratio
c – confidence interval
d – adjusted for all other variables in the table
e – approximate age at interview
f – first heterosexual intercourse

Methods for complex survey data (svy commands) in STATA were used to obtain estimates of proportions and numbers Of individuals. Logistic regression for survey data was used to compute pseudo-maximum likelihood estimates of odds ratios with 95% CI and results of adjusted Wald tests for significance. Four individuals who reported FHI at a younger age than first heterosexual experience were excluded from analyses. All individuals with "other religious affiliations than Roman Catholic" were excluded from analyses. Only weighted numbers of 772 men and 793 women without missing values for any of the variables in the model were included in analyses.

during 1975-1982) was very similar to the proportion in the middle birth cohort (born during 1965-1974), 5.0% and 4.8% respectively. This indicates that quite likely a greater proportion of women born more recently will have eventually accumulated high numbers of lifetime male partners in comparison to those born earlier. Also, as already described in the previous sub-chapter, the proportion of individuals with at lest ten lifetime heterosexual partners varied with marital status. Previously married men and women, quite expectedly, much more frequently reported ten or more lifetime heterosexual partners than those who were married or those in

cohabitation or those who were still single (men 56.8%, 28.2%, 33.7%, 23.7% and women 15.0%, 3.5%, 6.3%, 8.7% respectively). Apart from the marked gender differences, the variation in proportion of those with ten or more lifetime heterosexual partners by marital status had a different pattern among men than among women. The variation among men was somewhat less pronounced. Also, as expected, those men who were still single least frequently reported ten or more female partners ever. In contrast, among women, a significantly higher proportion of those who were still single accumulated ten or more male partners than of those who were already married (8.7%, 3.5%). This may indicate that substantially more women from most recent generations who are still single will have accumulated high numbers of male partners before they eventually get married, if at all, than married women from previous generations.

Men with second stage secondary or third level education reported ten or more lifetime female partners slightly more often than those with lower education (29.5%, 29.2% and 25.6% respectively), but the differences were not statistically significant. In contrast, the highest proportion of those with ten or more male partners among women were among those with third level education in comparison to those with second stage secondary and those with less than second stage secondary education (12.1%, 4.0%, 3.8%). Men and women with no religious affiliation reported ten or more lifetime heterosexual partners slightly more frequently (32.1% and 6.3%) than Roman Catholics (25.3% and 5.3%), however, these differences were not statistically significant for either gender. Finally both men and women, who had experienced early first heterosexual intercourse (before the age of 16) reported ten or more lifetime heterosexual partners much more frequently than others (57.5% and 14.0% in comparison to 22.4% and 4.7%).

The results of multivariate analysis exploring joint effects of these demographic and social characteristics and the effect of early intercourse on the likelihood of having had ten or more heterosexual partners during lifetime together with results of relevant univariate analyses are presented in Table 6.3. Numbers of accumulated heterosexual partners over the lifetime reflect both recent and past behaviour and are influenced by the number of sexually active years. Thus, quite expectedly, the youngest men and women (born during 1975-1982) were least likely to have accumulated ten or more heterosexual partners ever, adjusted ORs in comparison to the oldest (born in 1950-1964) were 0.4 (CI_{95} 0.2=-0.7) for men and 0.3 (CI_{95} 0.1-0.8) for women. Although the group was quite small, there was some evidence that previously married men were more likely to have had ten or more female partners lifetime than those who were still married (adjusted OR 3.4; CI_{95} 1.1-10.7). The differences between women with different marital status were more pronounced. Previously married women were approximately four times more likely

Table 6.3. Association of at least 10 heterosexual partners during lifetime with birth cohort, marital status, education, and early first heterosexual intercourse for men and women (multivariate analysis)

		10+ partners[a]		Unadjusted		Adjusted[d]	
		%	Base	OR[b]	p value (95% CI[c])	OR[b]	p value (95% CI[c])
Men							
Birth cohort (age[e])							
1950-1964	(35-49)	31.6	386	1	p<0.01	1	p=0.01
1965-1974	(25-34)	28.7	249	0.9	(0.6-1.3)	0.8	(0.4-1.2)
1975-1982	(18-24)	19.2	196	0.5	(0.3-0.8)	0.4	(0.2-0.7)
Marital status							
Married		28.1	385	1	p=0.05	1	p=0.14
Cohabiting		34.2	104	1.3	(0.8-2.2)	1.4	(0.8-2.6)
Previously married		56.8	17	3.4	(1.0-11.0)	3.4	(1.1-10.7)
Single		23.8	325	0.8	(0.6-1.2)	1.3	(0.7-2.3)
Education							
<2nd stage secondary		25.9	363	1	p=0.58	1	p=0.29
2nd stage secondary		29.5	348	1.2	(0.8-1.7)	1.4	(0.9-2.1)
3rd level		28.5	120	1.1	(0.7-1.9)	1.1	(0.7-2.0)
Early FHI[f] (before age 16)							
No		22.4	704	1	p<0.01	1	p<0.01
Yes		57.5	126	4.7	(3.0-7.2)	5.2	(3.3-8.1)
Women							
Birth cohort (age[e])							
1950-1964	(35-49)	6.1	404	1	p=0.78	1	p=0.04
1965-1974	(25-34)	4.8	251	0.8	(0.3-1.7)	0.5	(0.2-1.1)
1975-1982	(18-24)	5.0	184	0.8	(0.4-1.6)	0.3	(0.1-0.8)
Marital status							
Married		3.5	499	1	p=0.01	1	p<0.01
Cohabiting		6.3	100	1.9	(0.7-4.7)	2.3	(0.9-6.1)
Previously married		15.7	33	5.1	(1.6-16.6)	3.9	(1.2-12.8)
Single		8.3	208	2.5	(1.3-4.8)	4.7	(1.9-11.6)
Education							
<2nd stage secondary		3.5	309	1	p=0.01	1	p=0.01
2nd stage secondary		4.0	355	1.1	(0.5-2.5)	1.3	(0.6-2.9)
3rd level		12.1	174	3.8	(1.7-8.5)	3.9	(1.7-8.9)
Early FHI[f] (before age 16)							
No		4.7	777	1	p<0.01	1	p<0.01
Yes		14.9	62	3.5	(1.7-7.3)	4.3	(2.0-9.3)

a – heterosexual partners only
b – odds ratio
c – confidence interval
d – adjusted for all other variables in the table
e – approximate age at interview
f – first heterosexual intercourse

Methods for complex survey data (svy commands) in STATA were used to obtain estimates of proportions and numbers Of individuals. Logistic regression for survey data was used to compute pseudo-maximum likelihood estimates of odds ratios with 95% CI and results of adjusted Wald tests for significance. Four individuals who reported FHI at a younger age than first heterosexual experience were excluded from analyses. Only weighted numbers of 830 men and 839 women without missing values for any of the variables in the model were included in analyses.

and single women approximately five times more likely to have had ten or more male partners lifetime than those who were married (adjusted ORs 3.9 (CI_{95} 1.2-12.8); 4.7; CI_{95} 1.9-11.6)). In addition, women with third level education were approximately four times more likely to have ten or more male partners ever than those with less than second stage secondary education (adjusted OR 3.9; CI_{95} 1.7-8.9). In contrast the education level did not influence the likelihood

of having ten or more lifetime female partners for men. Finally, men and women were much more likely to have had ten or more heterosexual partners ever if they had experienced early first heterosexual intercourse. The adjusted ORs were 5.2 (CI_{95} 3.3-8.1) for men and 4.3 (CI_{95} 2.0-9.3) for women.

6.1.3. Acquisition of new partners

To have formed at least one new heterosexual partnership in the past year was reported by 22.7% (CI_{95} 19.9%-25.8%) of men and by less than half as many women, 9.5% (CI_{95} 7.9%-11.4%). The highest reported number of new heterosexual partners in the past year among men was 55 and among women five. The mean reported rates of new heterosexual partners acquisition were 0.4 (SD 1.9) for men and 0.1 (SD 0.5) for women.

Younger individuals had formed new heterosexual relationships much more frequently than older. The proportion of men of all ages who reported that they had formed at least one new heterosexual relationship during the past year, was consistently higher than the corresponding proportion of women. This gender heterogeneity was statistically significant ($p<0.01$) for all birth cohorts. Also, men of all ages consistently reported higher mean rates of new heterosexual partners acquisition in the past year than women. All these differences in mean rates were statistically significant ($p<0.01$) for all birth cohorts.

Among the youngest men (born during 1975-1982), 44.0% (CI_{95} 38.6%-49.6%) reported at least one new female partner in the past year in comparison to 21.9% (CI_{95} 16.6%-28.5%) and 12.7% (CI_{95} 9.4%-17.0%) among those born during 1965-1974 and 1950-1964. Similarly among the youngest women (born during 1975-1982), 30.6% (CI_{95} 25.6%-36.1%) reported at least one new male partner in the past year in comparison to 5.1% (CI_{95} 2.8%-9.1%) and 2.7% (CI_{95} 1.4%-5.0%) among those born during 1965-1974 and 1950-1964. The mean rates of new heterosexual partner acquisition among men declined from 1.1 (SD 3.7) for those born during 1975-1982 to 0.1 (SD 0.5) for those born during 1950-1964 ($p<0.01$) and among women from 0.4 (SD 0.9) for those born during 1975-1982 to 0.03 (SD 0.5) for those born during 1950-1964 ($p<0.01$).

Whether individuals had formed new heterosexual relationships in the past year varied substantially by marital status. However again, irrespective of the marital status, the proportion of men who reported that they had formed at least one new heterosexual relationship during the past year, was consistently higher than the corresponding proportion of women (all $p<0.01$). Also, irrespective of marital status, men consistently reported higher mean rates of new

heterosexual partner acquisition in the last year than women. These gender differences were statistically significant for married or cohabiting, previously married (separated, divorced or widowed), and single individuals ($p<0.01$, $p=0.02$, $p<0.01$ respectively).

Among previously married 62.1%, (CI_{95} 32.2%-85.0%) of men and 15.2% (CI_{95} 6.2%-32.4%) of women reported having formed at least one new heterosexual partnership in the past year and among single 42.2% (CI_{95} 37.2%-47.4%) of men and 31.7% (CI_{95} 26.4%-37.6%) of women. The corresponding proportions among individuals who were either married or in cohabitation were 8.9% (CI_{95} 6.4%-12.2%) for men and 1.5% (CI_{95} 0.8%-3.0%) for women. Among men, mean rates of new heterosexual partners acquisition in the past year were lowest among married or cohabiting respondents (0.1; SD 0.4), intermediate among single (0.9; SD 3.0), and highest among previously married respondents (1.3; SD 2.0). The corresponding pattern among women was different. The mean rates of new heterosexual partner acquisition in the past year were also the lowest among married or cohabiting (0.02; SD 0.2), but intermediate among previously married (0.2; SD 0.5), and highest among single women (0.4; SD 0.5).

Of the total number of new partnerships in the past year formed by all male respondents, 75.5% were reported by single or previously married men, who together constituted 40.4% of all male respondents. The equivalent figures for female respondents were 89.5% and 29.0%.

6.1.4. Concurrency

A sizeable minority of individuals had engaged in more than one heterosexual partnership simultaneously (concurrent partnerships) at least once during their lifetime. Concurrency ever was reported by 35.3% (CI_{95} 31.5%-39.3%) of men and approximately half of that, 15.3% (CI_{95} 12.8%-18.2%) among women. Simultaneously ongoing heterosexual partnerships more recently, in the past 5 years, were reported by 24.4% (CI_{95} 21.3%-27.8%) of men and 8.2% (CI_{95} 6.6%-10.3%) of women and very recently, in the past year, by 13.5% (CI_{95} 11.1%-16.4%) of men and 2.8% (CI_{95} 1.9%-4.0%) of women.

Over all time periods and irrespective of age, men consistently reported concurrency more frequently than women. This gender heterogeneity was statistically significant ($p<0.05$) for all birth cohorts and all time periods concerned, except for the borderline significance for the most recent cohort and the most recent period, the past year (men 10.5%, women 6.2%, $p=0.06$). This could indicate that women are becoming more similar to men in this respect.

The variation in the proportion of individuals with concurrent heterosexual relationships over lifetime, in the past five years and in the past year stratified by gender and birth cohort is shown in Table 6.4. There was no evidence for difference in proportions of men of different ages engaging in concurrent relationships either during the most recent period of the past year or for the period of the past five years. However, as the proportion of respondents with concurrent heterosexual relationships over the lifetime reflects both recent and past behaviour and is obviously influenced by the number of sexually active years, the proportion of those who reported concurrency over the lifetime was lowest among the youngest men. The corresponding pattern among women was different. The youngest women (born during 1975-1982) reported engaging in concurrent relationships during most recent periods of past year and past five years more frequently than women of the two earlier birth cohorts (1965-1974 and 1950-1964). In addition, the youngest women (born during 1975-1982) reported having ever engaged in concurrent relationships with similar frequency (17.0%) as women from two earlier cohorts (born during 1965-1974 and 1950-1964), 16.2% and 14.0%. This may indicate that a greater proportion of women born more recently will have eventually experienced concurrent heterosexual relationships during their lifetime than women born earlier.

Table 6.4. Proportions of men and women with concurrent heterosexual partnerships over lifetime, in the past 5 years, and in the past year by birth cohort

		Birth cohort (age[a])					
	Concurrency	1950-1964 (35-49)	1965-1974 (25-34)	1975-1982 (18-24)	(p value[b])	All cohorts	
Men	Lifetime	42.7%	31.5%	25.3%	(<0.01)	35.3%	(31.5%-39.3%)[c]
	Base (100%)	373	230	185		788	
	Past 5 years	24.7%	23.3%	25.2%	(0.87)	24.4%	(21.3%-27.8%)[c]
	Base (100%)	396	243	188		827	
	Past year	16.2%	11.6%	10.5%	(0.10)	13.5%	(11.1-16.4%)[c]
	Base (100%)	398	250	193		841	
Women	Lifetime	14.0%	16.2%	17.0%	(0.57)	15.3%	(12.8%-18.2%)[c]
	Base (100%)	396	241	180		816	
	Past 5 years	3.4%	10.5%	16.0%	(<0.01)	8.2%	(6.6%-10.3%)[c]
	Base (100%)	408	251	182		841	
	Past year	1.4%	2.6%	6.2%	(<0.01)	2.8%	(1.9%-4.0%)[c]
	Base (100%)	413	254	186		852	

a - approximate age at interview
b - p value for the test of heterogeneity of proportions
c - 95 % confidence interval

Methods for complex survey data (svy commands) in STATA were used to obtain weighted estimates. Numbers of individuals (base) included in analyses vary according to the number of missing values for individual variables.

6.1.5. Foreign partners

More than one in five individuals reported having had at least one heterosexual partner that was not Slovenian during their whole lifetime (24.0% (CI_{95} 20.8%-27.5%) of men, and 21.3% (CI_{95} 18.2%-24.7%) of women). For the more recent period, the past five years, the corresponding proportions were closer to one in ten individuals (12.6% (CI_{95} 10.1%-15.6%) of men, and 12.2% (CI_{95} 9.8%-15.1%) of women). For many of these individuals it was only one such partner ever. Thus, only one non-Slovenian heterosexual partner during the whole lifetime was reported by 9.0% (CI_{95} 7.1%-11.3%) of men and 13.1% (CI_{95} 10.8%-15.9%) of women. At the other end of the scale, 1% of men reported 20 or more and 1% of women four or more. Ten or more non-Slovenian heterosexual partners ever were reported by 3.2% (CI_{95} 2.1%-4.9%) of men and not a single woman.

The variation in the proportion of individuals with at least one non-Slovenian heterosexual partner over lifetime and in the past five years stratified by gender and birth cohort is shown in Table 6.5. Although, for the more recent period of the past five years, the proportion was highest among the youngest respondents (born during 1975-1982), the differences were not statistically significant.

Table 6.5. Proportions of men and women with non-Slovenian heterosexual partners over lifetime, and in the past 5 years by birth cohort

		Birth cohort (age[a])					
	Non-Slovenian heterosexual partners	1950-1964 (35-49)	1965-1974 (25-34)	1975-1982 (18-24)	(p value[b])	All cohorts	
Men	Lifetime	27.7%	22.4%	18.6%	(0.05)	24.0%	(20.8-27.5)[c]
	Base (100%)	396	256	196		848	
	Past 5 years	12.0%	10.3%	16.8%	(0.13)	12.6%	(10.1-15.6)[c]
	Base (100%)	398	254	194		846	
Women	Lifetime	24.2%	18.9%	18.1%	(0.13)	21.3%	(18.2-24.7)[c]
	Base (100%)	411	252	187		850	
	Past 5 years	11.1%	10.6%	18.7%	(<0.08)	12.2%	(9.8-15.1)[c]
	Base (100%)	409	252	187		848	

a - approximate age at interview
b - p value for the test of heterogeneity of proportions
c - 95 % confidence interval

Methods for complex survey data (svy commands) in STATA were used to obtain weighted estimates. Numbers of individuals (base) included in analyses vary according to the number of missing values for individual variables.

Some additional information was available for the only non-Slovenian heterosexual partner or if there were several, for the most recent one. Among non-Slovenian female partners of men, 6.2% were commercial sex workers, 63.6% casual partners, 8.1% steady partners and 22.1% spouses. Among non-Slovenian male partners of women, 38.8% were casual, 25.0% steady and 36.2% spouses. In fact a substantial proportion of these spouses and steady partners, may have been Slovenian citizens, but were of other former Yugoslav republic nationalities (for example Serbs, Muslims, Albanians, etc.). Unfortunately, this information was not available. The last such event or the last such relationship was reported to have occurred abroad by 48.7% of these men and 25.9% of women. Abroad in most cases meant Croatia (44.5% of these men, and 49.8% of women) or one of the former Yugoslav republics (for 22.9% of these men and 11.6% of women). As for Croatia, this is a common holiday destination for many Slovenians, but also for citizens of many other countries, including central and western Europeans. Thus, these non-Slovenian partners could be local Croatians, but could also come from other countries or be of other former Yugoslav nationalities. Unfortunately information on the nationality or citizenship of the last non-Slovenian heterosexual partner was not available. Finally, the last event or relationship was reported to have occurred somewhere in Europe for 27.4% of these men and 33.9% of women and somewhere else in the world for only 5.3% of these men and 4.8% of women.

6.1.6. Men paying for sex and commercial sex work

Ever having paid for sex with a woman was reported by 4.4% (CI_{95} 3.1%-6.4%) of men, 2.6% (CI_{95} 1.6%-4.1%) had done so within the last five years. For some, 2.1% (CI_{95} 1.2%-3.4%)of men, this was a once in a lifetime experience. At the other end of the scale, 1% reported having at least five women paid for sex and the highest number of female partners whom an individual man reported having paid for sex was 70. Having paid ten or more women for sex was reported by 0.9% (CI_{95} 0.4%-1.9%) of men.

Whether men had ever paid a woman for sex did not vary significantly by age, marital status, attained education, religious affiliation, living in one of the two biggest Slovenian cities, or whether they experienced early first heterosexual intercourse. However, the older the men, the higher the accumulated lifetime numbers of paid heterosexual partners. The mean numbers increased from 0.07 among the youngest men (born during 1975-1982) to 0.31 among the oldest (born during 1975-1982) ($p<0.03$).

Overall, 3.4% (CI_{95} 2.3%-5.0%) of men reported having paid foreign commercial sex workers, 1% of men four or more. To have paid for sex with ten or more non-Slovenian commercial sex workers was reported by 0.7% (CI_{95} 0.3%-1.7%) of men. In fact, within the total number of 226 reported paid female partners, more than two in three (68.8%) were not Slovenian and were paid for sex abroad. In many cases they were paid by men, who reported to have lived abroad for more than three months at a time at least once during their life. Having lived abroad for longer period was reported by 13.4% of all men, and 10.7% (CI_{95} 5.6%-19.5%) of these men reported having paid for sex to a non-Slovenian female abroad. In contrast, among men, who never lived abroad for longer periods, only 2.2% (CI_{95} 1.4%-3.7%) ever paid a foreign commercial sex worker abroad.

Again, the older the men, the higher the accumulated lifetime numbers of foreign paid heterosexual partners. The mean numbers increased from 0.07 among the youngest men (born during 1975-1982) to 0.29 among the oldest (born during 1975-1982) ($p<0.03$).

All respondents who anonymously completed self-administered questionnaires were, at the very end, asked whether they had ever received payment for sexual intercourse. Among men, 0.9% (CI_{95} 0.4%-2.1%) responded "yes", and among women 0.6% (CI_{95} 0.3%-1.3%). Not a single man among the youngest (born during 1975-1982) reported having been paid for sex. In contrast, 1.6% (CI_{95} 0.7%-3.7%) of the equivalent birth cohort of women reported having already been paid for sex, indicating a recent increase in selling sex among women ($p=0.06$).

6.1.7. Frequency of heterosexual intercourse

In contrast to the gender differences in reported numbers of partners, men and women show high levels of consistency in the overall pattern of reported frequency of heterosexual sex. The median reported numbers of acts of heterosexual intercourse in the past four weeks were 5 for both, men and women. Also, the overall mean reported numbers of episodes were very similar, 6.1 for men and 6.0 for women. The skewed distributions indicate considerable variability. While 24.5% (CI_{95} 21.3%-27.9%) of men and 29.1% (CI_{95} 26.0%-32.5%) of women, reported one to four heterosexual intercourse episodes during the past four weeks, on the other end of the scale, 1% of men reported 25 or more and 1% of women 20 or more. The maximum reported number of occasions was 70 among men and 75 among women. Thirty or more occasions of heterosexual intercourse during the past four weeks were reported by 0.5% (CI_{95} 0.2%-1.0%) of men and 0.4% (CI_{95} 0.1%-1.0%) of women.

Table 6.6 shows the distribution of reported numbers of heterosexual intercourse occasions in the past four weeks by gender and birth cohort (age group at interview). For men and women the frequency of sex varied with age. Quite expectedly, the proportion reporting no sex during the past four weeks was highest among the youngest individuals. Among the respondents born during 1975-1982, the proportions were 46.0% of men and 36.0% of women in comparison to 14.6% and 21.5% of men and 14.0% and 12.6% of women born during 1950-1964 and 1965-1974. This was also reflected in the relatively low median numbers of occasions of heterosexual intercourse among the youngest group, 2 for men, 3 for women, in comparison to the two earlier birth cohorts (1950-1964 and 1965-1974), 5, 5 for men and 5, 6 for women. At the other end of the scale, the most sexually active youngest men and women reported relatively high numbers of heterosexual intercourse episodes. Consequently, the mean numbers of episodes for different birth cohorts were more similar (6.4, 6.3, 5.3 for men and 5.7, 7.0, 5.5 for women from the earliest to the most recent birth cohort).

Table 6.6. Distribution of reported numbers of heterosexual intercourse occasions in the past four weeks for men and women by birth cohort (age at interview)

	Men				Women			
	Birth cohort (age[a])				Birth cohort (age[a])			
	1950-1964 (35-49)	1965-1974 (25-34)	1975-1982 (18-24)	All	1950-1964 (35-49)	1965-1974 (25-34)	1975-1982 (18-24)	All
0	14.6%	21.5%	46.0%	24.5%	14.0%	12.6%	36.0%	18.6%
1	4.5%	3.4%	2.1%	3.6%	6.5%	3.4%	3.8%	4.9%
2	6.5%	7.2%	3.7%	6.0%	9.2%	7.5%	4.0%	7.5%
3-4	17.3%	14.6%	11.2%	14.9%	18.5%	17.2%	12.5%	16.8%
5-9	28.5%	20.5%	13.6%	22.4%	30.2%	25.8%	19.7%	26.4%
10-19	25.1%	28.7%	18.1%	24.5%	19.5%	29.2%	16.8%	21.8%
20-29	3.5%	4.2%	3.5%	3.7%	2.2%	3.9%	6.2%	3.6%
30+	0.0%	0.0%	1.9%	0.5%	0.0%	0.5%	1.0%	0.4%
Mean[b]	6.42	6.33	5.31	6.12	5.65	6.96	5.49	6.01
SD[c]	5.33	5.64	8.80	6.45	4.70	5.68	7.56	5.80
Median	5	5	2	5	5	6	3	5
99th percentile	25	20	40	25	20	20	25	20
Base (100%)	345	245	193	783	364	239	179	783

a - approximate age at interview
b - mean is not the most appropriate summary measure as the distribution is skewed
c - standard deviation

Methods for complex survey data (svy commands) in STATA were used to obtain weighted estimates.

Table 6.7 shows the distribution of reported numbers of heterosexual intercourse occasions in the past four weeks by gender and marital status. Marriage or cohabitation implies the availability of a regular sexual partner. Thus, the overall frequency of sexual intercourse occasions, as reflected by the median numbers of occasions, was by far the highest in this group in comparison to previously married and single (6, 0, 1 for men and 6, 1, 2 for women). The

corresponding mean numbers were 7.6, 3.1, 4.2 for men and 6.8, 3.4, 4.3 for women. Among previously married and single individuals the reported numbers of heterosexual intercourse occasions in the past four weeks varied substantially according to whether they had or did not have a regular heterosexual partner at the time of the survey. Obviously, the reported frequency of heterosexual sex was much higher among those men and women who were in a steady heterosexual relationship at the time of the survey. Further details of these distributions are shown in Table A 6.5.

Table 6.7. Distribution of reported numbers of heterosexual intercourse occasions in the past four weeks for men and women by marital status

	Men				Women			
	Married cohabiting	Previously married[a]	Single	All	Married cohabiting	Previously married[a]	Single	All
0	5.9%	59.6%	48.3%	24.5%	6.3%	49.2%	46.3%	18.6%
1	4.5%	0.0%	2.5%	3.6%	5.6%	3.6%	3.2%	4.9%
2	7.3%	0.0%	4.5%	6.0%	8.3%	8.6%	5.1%	7.5%
3-4	17.4%	8.4%	11.9%	14.9%	20.1%	7.4%	9.3%	16.8%
5-9	29.1%	8.0%	13.8%	22.4%	30.4%	18.5%	17.2%	26.4%
10-19	31.5%	23.9%	14.8%	24.5%	25.3%	7.6%	14.8%	21.8%
20-29	3.9%	0.0%	3.7%	3.7%	3.6%	5.2%	3.5%	3.6%
30+	0.4%	0.0%	0.5%	0.5%	0.3%	0.0%	0.6%	0.4%
Mean[b]	7.63	3.13	4.20	6.12	6.80	3.37	4.34	6.01
SD[c]	6.32	4.37	6.18	6.45	5.18	5.14	6.86	5.80
Median	6	0	1	5	6	1	2	5
99th percentile	28 (70)	10 (10)	22 (50)	25	20 (40)	20 (20)	25 (75)	20
Base (100%)	443	17	323	783	545	29	208	783

a - separated / divorced / widowed
b - mean is not the most appropriate summary measure as the distribution is skewed
c - standard deviation

Methods for complex survey data (svy commands) in STATA were used to obtain weighted estimates.

Table A 6.6 shows the distribution of reported numbers of heterosexual intercourse occasions in the past four weeks by gender and birth cohort (age group at interview) restricting the analysis to men and women who reported at least one heterosexual partner during the past year. Thus, the variation in the frequency of sex with age was less marked. Again, quite expectedly, the proportion reporting no sex during the past four weeks was highest among the youngest individuals. Among the respondents born during 1975-1982, the proportions were 29.9% of men and 19.8% of women in comparison to 9.7% and 13.3% of men and 7.9% and 7.3% of women born during 1950-1964 and 1965-1974. At the other end of the scale, 1% of the youngest men and women who were most sexually active reported relatively high numbers of heterosexual intercourse occasions, 50 or more among men and 30 or more among women. Less variation among birth cohorts was also reflected in more similar median numbers of occasions of heterosexual intercourse. From the earliest to the most recent birth cohort, the medians were 6, 6, 4 among men and 5, 6, 5 among women. The corresponding mean numbers were 6.8, 7.0, 7.0 for men and 6.1, 7.4, 6.9 for women from the oldest to the youngest group.

6.1.8. Repertoire of heterosexual practices

All but 4.8% (CI_{95} 3.7%-6.3%) of men and 3.7% (CI_{95} 2.8%-4.8%) of women reported having had experience of vaginal intercourse at some time in their life, so far. Exclusively vaginal sexual intercourse so far was reported by 9.7% (CI_{95} 7.7%-12.3%) of men and 14.4% (CI_{95} 11.9%-17.4%) of women. Oral sex is also a very common experience. Fellatio was reported by 79.3% (CI_{95} 76.2%-82.0%) of men and 72.7% (CI_{95} 69.5%-75.8%) of women and cunnilingus by 78.1% (CI_{95} 75.0%-80.9%) of men and 77.3% (CI_{95} 74.3%-80.1%) of women. In contrast to these common penetrative heterosexual practices, anal intercourse was reported less frequently, by 31.6% (CI_{95} 27.9%-35.6%) of men and by 22.3% (CI_{95} 19.6%-25.4%) of women. The experience of exclusively oral sex or exclusively anal sex is almost non-existent. Exclusively oral sex was reported by only 0.1% (CI_{95} 0.0%-0.5%) of women and not a single man and anal intercourse by only 0.1% (CI_{95} 0.0%-0.6%) of men and not a single women. Many individuals also reported the experience of non-penetrative sex at some time in their life, so far. Genital stimulation that did not result in intercourse was reported by 77.3% (CI_{95} 74.0%-80.2%) of men and 69.0% (CI_{95} 65.4%-72.4%) of women.

Table 6.8 shows proportions of men according to the last occasion on which they experienced particular heterosexual practices, if ever. Vaginal intercourse was by far the most frequent practice. For the past week it was reported by 64.1% (CI_{95} 60.7%-67.4%) of men and 66.1% (CI_{95} 62.7%-69.3%) of women. A much lower proportion of individuals reported oral sex during the same period. This indicates that oral sex is a less frequent practice. Fellatio was reported by 22.9% (CI_{95} 19.7%0-26.3%) of men and 23.1% (CI_{95} 20.3%-26.1%) of women and cunnilingus by 25.3% (CI_{95} 21.9%-29.1%) of men and 22.6% (CI_{95} 19.9%-25.7%) of women. Anal intercourse is by far the least common penetrative heterosexual practice. Anal intercourse in the past week was reported by 5.3% (CI_{95} 3.9%-7.1%) of men and 4.0% (CI_{95} 2.8%-5.6%) of women. Finally, non-penetrative sex during the past week was reported by 17.9% (CI_{95} 15.1%-21.1%) of men and 13.4% (CI_{95} 11.2%-15.9%) of women.

Table 6.9 shows the reported proportion of different heterosexual practices during the past year and during lifetime (so far) for men and women stratified by birth cohort (age at interview). By the age of 25, the experience of vaginal intercourse is nearly universal. Also, a great majority of men aged 25 years or more had the experience of oral sex, and so did women born in the late sixties and early eighties. In contrast, women who were born during the fifties and early sixties less frequently reported ever having had oral sex. To have ever experienced oral sex was reported by 90.9% of women born during 1965-1974, but only 76.1% of those born during 1950-1064. Also, among men and women aged 25 years or more, although the proportion of

those having experienced anal sex was much lower than for other penetrative heterosexual practices, it had risen among those born more recently. Anal sex was reported by 42.6% of men and 30.1% of women born during 1965-1974 and only 27.9% of men and 18.3% of women born during 1950-1064. Finally, the experience of non-penetrative sex has also become more common among the more recent birth cohorts.

Table 6.8. Distribution of recency of different heterosexual practices for men and women

		Vaginal intercourse %	Fellatio %	Cunnilingus %	Anal sex %	Non-penetrative sex %
Men						
	In the last 7 days	64.1	22.9	25.3	5.3	17.9
	7 days-4weeks ago	13.3	21.8	23.9	4.2	19.4
	4 weeks-6 months ago	9.4	17.5	15.2	6.7	17.9
	6 months-1 year ago	3.3	6.9	6.0	3.1	9.0
	1-5 years ago	3.5	7.4	5.8	8.4	7.7
	>5 years ago	1.5	2.9	1.9	4.0	5.4
	Never	4.8	20.8	21.91	68.4	22.7
	Base (100%)	857	832	829	821	832
Women						
	In the last 7 days	66.1	23.1	22.6	4.0	13.4
	7 days-4weeks ago	16.2	17.0	19.4	2.9	18.6
	4 weeks-6 months ago	6.0	14.1	16.33	4.3	13.8
	6 months-1 year ago	2.7	7.7	7.5	2.4	8.6
	1-5 years ago	3.6	6.8	7.4	5.0	6.8
	>5 years ago	1.8	4.1	4.1	3.9	7.8
	Never	3.7	27.3	22.7	77.7	31.0
	Base (100%)	842	829	826	826	828

Methods for complex survey data (svy commands) in STATA were used to obtain weighted estimates. Numbers of individuals (base) vary according to the number of missing values for individual variables.

Table 6.9. Proportions of men and women reporting different heterosexual practices in the past year and during lifetime by birth cohort (age at interview)

	Vaginal intercourse			Oral sex[a]			Anal intercourse			Non-penetrative sex[b]		
	Past year %	Ever %	Base	Past year %	Ever %	Base	Past year %	Ever %	Base	Past year %	Ever %	Base
Men												
1950-1964 (35-49)[c]	95.9	99.1	403	77.0	86.1	383	16.1	27.9	378	58.3	73.2	381
1965-1974 (25-34)[c]	90.5	97.2	259	81.7	87.7	252	25.0	42.6	248	72.8	84.8	255
1975-1982 (18-24)[c]	77.8	84.5	195	63.5	72.1	194	17.8	24.8	194	64.3	75.4	196
All ages	90.2	95.2	857	75.3	83.3	829	19.2	31.6	821	64.2	77.3	832
Women												
1950-1964 (35-49)[c]	93.6	99.8	402	63.3	76.1	396	11.0	18.3	391	46.2	63.6	394
1965-1974 (25-34)[c]	95.1	99.0	252	81.2	90.9	247	16.9	30.1	250	60.2	76.4	246
1975-1982 (18-24)[c]	79.8	85.3	188	69.2	75.0	186	14.3	20.4	184	64.0	70.5	188
All ages	91.0	96.3	842	70.0	80.2	829	13.5	22.3	826	54.4	69.0	828

a - either cunnilingus or fellatio
b - genital contact only and no intercourse (penetrative sex)

Methods for complex survey data (svy commands) in STATA were used to obtain weighted estimates. Numbers of individuals (base) vary according to the number of missing values for individual variables.

Table 6.10 provides further insight into the frequency of individual heterosexual practices among recently sexually active individuals of different ages. The analysis was restricted only to men and women, who reported at least one heterosexual partner during the past year. Proportions of those having experienced a particular heterosexual practice during the past year and ever (so far) are shown stratified by birth cohort (age at interview). All three heterosexual practices, oral sex, anal intercourse and non-penetrative sex, in the past year, were more frequent among the two more recent birth cohorts of men and women (1965-1974 and 1975-1982) in comparison to the earliest cohort (1950-1964). The differences between the three birth cohorts were quite marked ($p<0.01$ for all three practices among men and women, except for $p=0.05$ for anal intercourse among women).

Table 6.10. Proportions of men and women reporting different heterosexual practices in the past year and during lifetime by birth cohort (age at interview) among individuals with at least one heterosexual partner in the past year

	Vaginal intercourse			Oral sex[a]			Anal intercourse			Non-penetrative sex[b]		
	Past year %	Ever %	Base	Past year %	Ever %	Base	Past year %	Ever %	Base	Past year %	Ever %	Base
Men												
1950-1964 (35-49)[c]	100.0	100.0	374	80.2	87.3	354	16.0	26.9	350	60.8	74.3	352
1965-1974 (25-34)[c]	99.4	100.0	226	89.7	92.2	223	27.2	44.4	220	80.0	8.3	224
1975-1982 (18-24)[c]	100.0	100.0	150	82.9	89.3	148	23.3	30.5	148	80.7	90.7	150
All ages	99.8	100.0	749	83.7	89.2	725	20.9	33.0	718	70.8	82.0	726
Women												
1950-1964 (35-49)[c]	99.6	100.0	377	67.4	77.3	372	11.7	19.1	367	49.0	64.6	371
1965-1974 (25-34)[c]	100.0	100.0	240	85.5	93.0	234	17.8	31.6	238	63.4	77.8	234
1975-1982 (18-24)[c]	98.5	99.3	150	85.5	89.3	148	17.5	24.5	147	76.0	82.7	150
All ages	99.5	99.9	767	76.6	84.5	755	14.8	24.1	752	58.9	72.3	754

a - either cunnilingus or fellatio
b - genital contact only and no intercourse (penetrative sex)

Methods for complex survey data (svy commands) in STATA were used to obtain weighted estimates. Analysis was restricted to those individuals who reported at least one heterosexual partner during the past year. Numbers of individuals (base) vary according to the number of missing values for individual variables.

6.1.9. Women forced into sex

Coercion into sexual intercourse was not uncommon. The question asked was "when, if ever, was the last time a man forced you into sexual intercourse". More than one in ten women (12.0%; CI_{95} 9.8%-14.5%) reported having ever been forced, and for 2.0% (CI_{95} 1.2%-3.25%) this had happened during the past year. The proportion of women ever forced did not vary between women of different ages (birth cohorts) ($p=0.44$). The reported proportion was higher

among women who were either separated or divorced or widowed (22.9%; CI_{95} 10.7%-42.5%) than among married (11.3%; CI_{95} 8.7%-14.4%) and single (12.3%; CI_{95} 8.6%-17.4%), but the differences were not statistically significant (p=0.25). This could easily be due to a very low power to detect differences, as the group of previously married individuals was very small indeed.

6.2. Homosexual experience, partnerships, practices, and HIV risk behaviours

As shown in Table 6.11, during the face to face interview, 96.8% (CI_{95} 95.3%-97.8%) of men reported having been sexually attracted exclusively to women and 94.4% (CI_{95} 92.7%-95.7%) of women exclusively to men. Similar proportions reported exclusively heterosexual experience, 95.6% (CI_{95} 94.0%-96.8%) of men and 96.3% (CI_{95} 95.1%-97.3%) of women. Homosexual attraction and experience were quite uncommonly reported and exclusively homosexual experience was extremely rare. Some homosexual experience was reported by 2.0% (CI_{95} 1.2%-3.2%) of men and 2.0% (CI_{95} 1.3%-3.1%) of women. However, there was a discrepancy between the proportion of individuals who reported homosexual experience during the face to face interview and during anonymous self-completion of the questionnaires. A low proportion of respondents reported no sexual experience so far and a very low proportion refused to answer this question during the face to face interview.

Table 6.11. Heterosexual and homosexual attraction and experience for men and women (as reported during the face to face interview)

	Attraction		Experience[a]	
	Men	Women	Men	Women
	% (95% CI[b])	% (95% CI[b])	% (95% CI[b])	% (95% CI[b])
Only heterosexual	96.8 (95.3-97.8)	94.4 (92.7-95.7)	95.6 (94.0-96.8)	96.3 (95.1-97.3)
Mostly heterosexual	2.3 (1.5-3.6)	3.7 (2.7-5.1)	1.7 (1.0-2.9)	1.9 (1.2-3.0)
Both heterosexual and homosexual	0.1 (0.0-0.5)	0.3 (0.1-1.0)	0.2 (0.0-0.6)	0.1 (0.1-0.4)
Mostly homosexual	0.3 (0.1-1.1)	0.1 (0.0-0.5)	0.1 (0.0-0.6)	0.1 (0.0-0.5)
Only homosexual	0.0	0.2 (0.0-1.1)	0.0	0.0
None	0.4 (0.1-1.3)	0.1 (0.0-0.5)	1.6 (1.0-2.6)	1.5 (1.0-2.3)
Refused	0.2 (0.1-1.0)	0.1 (0.0-0.5)	0.8 (0.4-1.8)	0.2 (0.0-1.1)
Base (100%)	882	866	885	878

a - any contact with another person that was perceived as sexual (kissing, touching, intercourse,...)
b - confidence interval

Methods for complex survey data (svy commands) in STATA were used to obtain weighted estimates. Numbers of individuals (base) vary depending on missing values.

As shown in Table 6.12, 3.3% (CI_{95} 2.3%-4.8%) of men and 3.6% (CI_{95} 2.6%-5.0%) of women, anonymously reported in self-completed questionnaires having had some homosexual experience during their lifetime. Fewer individuals reported ever having had homosexual genital contact, 1.7% (CI_{95} 1.0%-3.0%) of men and 1.2% (CI_{95} 0.6%-2.3%) of women. The proportion of those who reported homosexual intercourse (oral sex for both genders, anal intercourse for men) was, as expected, even lower. Homosexual intercourse was reported by 1.0% (CI_{95} 0.5%-2.0%) of men, and 1.0% (CI_{95} 0.5%-1.9%) of women, in fact, eight men and nine women (unweighted count). For most of these individuals it involved only one homosexual partner ever (so far). Two or more homosexual partners ever were reported by only 0.4% (CI_{95} 0.1%-1.5%)

of men and 0.3% (CI_{95} 0.0%-0.8%) of women, in fact, three men and three women (unweighted count). All three women reported only two homosexual partners ever and the three men, four, five and six male partners. Two men and one woman reported non-Slovenian homosexual partners (one and three) and none of the men reported having ever paid for sex with a man. Homosexual penetrative sex during the past five years was reported by 0.6% (CI_{95} 0.2%-1.5%) of men and 0.4% (CI_{95} 0.2%-1.1%) of women.

Table 6.12. Proportions of men and women with homosexual experience and partnerships over lifetime, and in the past 5 years by birth cohort (reported anonymously in self-administered questionnaires)

		Birth cohort (age[a])					
		1950-1964 (35-49)	1965-1974 (25-34)	1975-1982 (18-24)	(p value[b])	All cohorts	
Men	Any homosexual experience ever	2.0%	4.7%	4.2%	(0.16)	3.3%	(2.3%-4.8%)[c]
	Base (100%)	400	259	198		857	
	Any homosexual genital contact ever	1.3%	2.6%	1.3%	(0.41)	1.7%	(1.0%-3.0%)[c]
	Base (100%)	403	254	196		853	
	Homosexual partner/s ever	0.6%	1.2%	1.3%	(0.67)	1.0%	(0.5% - 2.0%)[c]
	Base (100%)	404	255	196		855	
	2 or more homosexual partners ever	0.3%	0.7%	0.4%	(0.83)	0.4%	(0.1% - 1.5%)[c]
	Base (100%)	404	255	196		855	
	Homosexual partner/s, past 5 years	0.3%	0.7%	1.0%	(0.68)	0.6%	(0.2% - 1.5%)[c]
	Base (100%)	404	255	196		855	
Women	Any homosexual experience ever	2.5%	2.8%	7.1%	(0.02)	3.6%	(2.6%-5.0%)[c]
	Base (100%)	411	252	188		852	
	Any homosexual genital contact ever	0.4%	1.9%	2.1%	(0.12)	1.2%	(0.6%-2.3%)[c]
	Base (100%)	413	252	187		853	
	Homosexual partner/s ever	0.4%	1.4%	1.5%	(0.29)	1.0%	(0.5% - 1.9%)[c]
	Base (100%)	413	252	187		853	
	2 or more homosexual partners ever	0.0%	0.4%	0.6%	(0.26)	0.3%	(0.0% - 0.8%)[c]
	Base (100%)	413	252	187		853	
	Homosexual partner/s, past 5 years	0.0%	0.5%	1.2%	(0.89)	0.4%	(0.2% - 1.1%)[c]
	Base (100%)	413	252	187		853	

a - approximate age at interview
b - p value for the test of heterogeneity of proportions
c - 95 % confidence interval
Methods for complex survey data (svy commands) in STATA were used to obtain weighted estimates.

Most of these different homosexual behaviour patterns tended to be most commonly reported in the youngest group, however, the variation in these proportions between different birth cohorts were minor (Table 6.12) and the differences were not statistically significant. There was one exception. A significantly higher proportion of women born most recently (1975-1982) reported

having ever had some homosexual experience than those born earlier (1950-1964, 1965-1974) (p=0.02).

At the time of the survey, the majority of men who reported at least one lifetime male partner were married or in cohabitation with a female partner. One of these five men reported five lifetime homosexual partners, all concurrent with another sexual relationship, but the information on whether this other relationship was heterosexual or homosexual was not available. The only previously married man reported six lifetime female partners. Among the nine women, four were married. One of them reported two lifetime female partners and the other one only. One woman reported one concurrent relationship ever.

Of all men and women with homosexual partners ever, two men and two women did not report what types of homosexual intercourse they had experienced. The remaining six men reported oral sex, all as passive and three also as active partners. Of the three men who also reported anal intercourse, this was only insertive for one, only receptive for another one and both insertive and receptive for the third man. One of these men also reported having been forced into homosexual intercourse. Of the seven women who reported homosexual intercourse practices, five reported both passive and active oral sex and two only passive.

Again, exclusively homosexual behaviour was extremely rare. Of the eight men and nine women who reported at least one homosexual partner ever, all except for one of the women reported heterosexual partners also. Their numbers varied from one to 40 for men and from one to 22 for women. Three of these men and five of these women reported ten or more lifetime heterosexual partners.

6.3. Injecting drug use and sexual mixing of non-users with users

Four respondents reported having injected illegal drugs like heroin or cocaine. Thus, the minimal weighted population estimates for having ever injected illegal drugs were 0.3% (CI_{95} 0.1%-1.1%) for men and 0.1% (CI_{95} 0.0%-0.6%) for women. Three of these injecting drug users were in the 18-24 years old group (born during 1975-1982) and all of them reported having injected within the past five years. Thus, the minimal weighted population estimates for injecting drug use during the past five years among the youngest individuals (born during 1975-1982) were 0.6% (CI_{95} 0.2%-2.6%) for men and 0.4% (CI_{95} 0.1%-2.6%) for women. The four injecting drug users came from three different regions of Slovenia. Two lived in the capital city Ljubljana, and the other two in smaller communities. Only one reported ever having shared the injecting equipment.

All these four injecting drug users reported higher than the median number of lifetime heterosexual partners. The three men reported six, 20 and 25 female partners and the woman, five male partners lifetime. The three men together reported more detailed information on a total of six most recent heterosexual partnerships during the past five years. Although specifically asked, none of them reported having known any of these six women to have ever injected illegal drugs, either during their relationship or before. Also, similarly, the only woman did not report knowing any of her three most recent male partners to have ever injected illegal drugs, either during their relationship or before. None of the four injecting drug users reported having been paid for sex.

All respondents who anonymously completed self-administered questionnaires were asked, whether they had ever had sexual intercourse with someone whom they knew had injected illegal drugs. A total of 14 men and 17 women answered "yes". Two of these individuals, a man and a woman, reported having injected illegal drugs themselves. Excluding these two individuals from the analyses, the minimal weighted estimates of non-injecting drug users known to have ever had sex with a person who had injected illegal drugs were 1.2% (CI_{95} 0.7%-2.0%) for men and 1.3% (CI_{95} 0.8%-2.1%) for women. The corresponding proportions for the period of the past five years were 1.1% (CI_{95} 0.6%-1.9%) for men and 1.2% (CI_{95} 0.7%-2.0%) for women. Most of these individuals were from the 18-24 years age group (born during 1975-1982) and had sex with an injecting drug user within the past five years (10 men and 12 women). Thus, the minimal weighted population estimates for 18 to 24 years old individuals, who themselves never injected illegal drugs, but knew that they had had sex in the past five years with a person who had injected illegal drugs, were 3.0% (CI_{95} 1.6%-5.6%) for men and 3.8% (CI_{95} 2.1%-6.6%) for women.

6.4. Summary

The variability in the reported numbers of partners between individuals of different ages and between men and women is quite striking. Approximately one in five men and two in five women reported no or only one heterosexual partner ever, and at the other end of the scale, 1% of men reported 58 or more and 1% of women 20 or more. Men of all ages consistently reported higher numbers of heterosexual partners than women over all time periods. As expected, the oldest respondents had accumulated higher numbers of lifetime heterosexual partners than the youngest, who had less time to acquire so many. However a higher proportion of women who were born more recently had become more sexually active and accumulated relatively high numbers of male partners at a younger age.

A sizeable minority of individuals, a much higher proportion among men than among women, accumulated high numbers of heterosexual partners during the course of their lifetime. At least ten heterosexual partners so far were reported by approximately one in four men and close to one in 20 women. As the numbers of accumulated lifetime heterosexual partners reflect both recent and past behaviour and are influenced by the number of sexually active years, the youngest men and women were the least likely to have accumulated so many. Previously married men and women were more likely to have accumulated at least ten heterosexual lifetime partners than married. Women with third level education were more likely to have accumulated ten or more male partners than those with less than second stage secondary. The education level did not influence this likelihood for men. Finally, those men and women who had experienced early first heterosexual intercourse (before the age of 16) were much more likely to have accumulated at least ten heterosexual partners during their life.

For the most recent period, the past year, the great majority of individuals, approximately two in three men and four in five women, reported only one heterosexual partner. At the other end of the scale, the 1% sexually most active men reported eight or more and women three or more heterosexual partners. Approximately one in five men and one in 15 women reported two or more heterosexual partners in the past year. The overwhelming majority of respondents who were either married or cohabiting reported only one heterosexual partner. Interestingly, there were no substantial differences in the pattern of reported numbers of heterosexual partners between married and those in cohabitation, either for men or for women. Although single respondents frequently reported having had no heterosexual partners in the past year, at the other end of the scale they much more frequently reported multiple heterosexual partners than married or cohabiting. Again, irrespective of marital status, men consistently reported higher numbers of heterosexual partners than women. Among men and women alike, single or

previously married respondents were much more likely to have had multiple heterosexual partners in the past year than those who were married or in cohabitation. Interestingly, for men and women alike, the increase in this likelihood was quite similar for those, who were, at the time of the survey, in stable relationships, and for those who were not. Again, men and women who had experienced early first heterosexual intercourse were also more likely to have had multiple heterosexual partners in the past year.

Close to one in five men and one in ten women reported that they had formed at least one new heterosexual partnership in the past year was reported by. Younger individuals formed new heterosexual relationships much more frequently than older, and men of all ages more frequently than women. New heterosexual partner acquisition rates were lowest among married or cohabiting (0.1 for men, 0.02 for women). Of the total number of reported new heterosexual partnerships formed in the past year, single or previously married men reported three in four and single or previously married women nine in ten. Among men, new heterosexual partner acquisition rates were highest among those married previously (1.3), and among women among those who were single (0.4).

Approximately one in three men and one in seven women had engaged in more than one heterosexual partnership simultaneously (concurrent partnerships) at least once during their lifetime. For approximately one in four men and one in twelve women this had happened during the past five years, and for one in seven men and one in 45 women in the past year. Over all time periods, men of all ages consistently reported concurrency more frequently than women.

More than one in five men and women reported at least one heterosexual partner that was not Slovenian, and approximately one in ten reported this in the past five years. A small proportion of men (3.2%) reported at least ten such female partners. One in 15 of the most recent non-Slovenian female partners of men, for whom information was available, were commercial sex workers. Two in three of the most recent non-Slovenian female partners of men and one in three most recent non-Slovenian male partners of women were casual. A substantial proportion of non-Slovenian spouses and steady partners, may have been Slovenian citizens, but of other former Yugoslav republic nationalities. Approximately two in three recent partnerships of this kind had occurred in one of the former Yugoslav republics, far fewer in one of the other European countries, and only one in 20 outside Europe.

Ever having paid for sex with a woman was reported by 4.4% of men, and 2.6% had done so within the past five years. For many, this was a once in a lifetime experience. At the other end of the scale, 1% reported having paid at least five women for sex and the highest number of

female partners whom an individual man reported having paid for sex was 70. Of the total number of reported paid female partners, more than two in three were not Slovenian. The latter were in many cases reported by men who had lived abroad for a period of at least 3 months, at least once during their lifetime.

In contrast to the gender differences in the reported numbers of partners, men and women showed high levels of consistency in the overall pattern of reported frequency of heterosexual sex. The median reported numbers of heterosexual sex occasions in the past month were 5 for both. At the other end of the scale, 1% of men reported 25 or more and 1% of women 20 or more. Not surprisingly, the proportion of those who reported no sex during the past month was the highest among the youngest individuals, but conversely, a sizeable proportion of young men and women reported relatively high numbers of heterosexual intercourse occasions. As being married or in cohabitation implies the availability of a regular sexual partner, as expected, the overall frequency of sexual intercourse was highest among these individuals.

The experience of vaginal intercourse was nearly universal by the age of 25. About three in four men and women also reported oral intercourse. However, oral intercourse was practised less frequently than vaginal intercourse. Among men of all ages, the experience of oral sex was relatively common, and among women it has become more common among those born more recently. In contrast to these common penetrative heterosexual practices, lifetime experience of anal intercourse was reported much less frequently (by one in three men and one in five women), however, this experience had become more common among those born more recently. Exclusively vaginal sexual intercourse experience was rarely reported (by approximately one in ten men and one in seven women), and the experience of exclusively oral sex or exclusively anal heterosexual intercourse was almost non-existent. Many individuals also reported non-penetrative sex, which has also become more common among those born more recently. Among those who were sexually active in the past year, vaginal intercourse was universal. In addition to that, it was the youngest men and women who most frequently reported other heterosexual practices such as oral sex, anal intercourse, and non-penetrative sex.

Coercion into sexual intercourse was not uncommon. More than one in ten women reported having been forced, and for one in fifty this happened during the past year. Previously married women more frequently reported having been forced than married, cohabiting or single, but the differences were not statistically significant.

Homosexual attraction and experience were quite uncommon and exclusively homosexual behaviour was extremely rare. Some homosexual experience was reported by 3.3% of men and

3.6% of women. Fewer, 1% of men and women, reported homosexual intercourse (oral sex for both genders and/or anal intercourse for men). For most of these individuals, this involved only one homosexual partner ever. Two or more homosexual partners ever were reported by less than half a percent of men and women. Homosexual sex during the past five years was reported by approximately half a percent of men and women. Among these men, the experience of exclusively oral homosexual sex was more common than that of anal intercourse. At the time of the survey, most of these men and also half of these women were married or in cohabitation with a heterosexual partner. The numbers of their reported lifetime heterosexual partners tended to be on the high side, especially for women. More than one in three of these men and more than one in two of these women reported at least ten lifetime heterosexual partners.

Three men and one woman (unweighted counts) reported having had injected illegal drugs such as heroin or cocaine. The minimal weighted population point estimates for having ever injected illegal drugs were 0.3% of men and 0.1% of women. Three of these injecting drug users were in the 18-24 years old age group (born during 1995-1982) and all of them reported injecting during the past five years. Thus, the minimal weighted population point estimates for injecting drug use during the past five years among these youngest individuals were 0.6% of men and 0.4% of women. Only one of the four reported having ever shared injecting equipment. All reported higher than the median reported number of lifetime heterosexual partners, in fact all more than five. None of them reported knowing any of their most recent heterosexual partners having ever injected illegal drugs, either during their relationship or before. None reported ever having been paid for sex.

A low proportion of those respondents who reported never having injected illegal drugs such as heroin or cocaine, 1.2% of men and 1.3% of women, reported that they knew they had had sex with a person who had injected illegal drugs. For 1.1% of men and 1.2% of women this occurred during the past five years. The corresponding minimal weighted population point estimates for 18 to 24 year old men and women were 3.0% and 3.8%.

7. *Chlamydia trachomatis* infection

Overall 3.0% (CI_{95} 1.9%-4.6%) of men and 1.6% (CI_{95} 1.0%-2.7%) of women tested positive for *Chlamydia trachomatis* infection. Table 7.1 shows the distribution of diagnosed *Chlamydia trachomatis* infections stratified by gender and age groups. Among men and women alike, the weighted point estimate of age specific prevalence was highest among 18 to 24 year olds and this was 4.1% (CI_{95} 2.2%-7.4%) for both genders.

Excluding from analysis the very small number of individuals who contributed urine specimens, but reported not having experienced heterosexual intercourse, overall 3.1% (CI_{95} 2.0%-4.8%) of men and 1.7% (CI_{95} 1.0%-2.7%) of women tested positive for *Chlamydia trachomatis* infection. Since almost all individuals who had not yet experienced first heterosexual intercourse were 18 to 24 years old, the age specific point prevalence estimate changed only for this age group. Among sexually experienced individuals 18 to 24 years old, 4.7% (CI_{95} 2.5%-8.5%) of men and 4.7% (CI_{95} 2.6%-8.5%) of women tested positive for *Chlamydia trachomatis* infection. The corresponding 95% CI on pooled data for both genders was 3.0% to 7.3%.

Table 7.1. Prevalence of undiagnosed infection with *Chlamydia trachomatis* among men and women of different ages

	Men			Women		
	Prevalence			Prevalence		
	%	(p value[a]) 95% CI[b]	Base	%	(p value[a]) 95% CI[b]	Base
Age (birth cohort[c])		(0.46)			(0.03)	
18-24 (1975-1982)	4.1	2.2 - 7.4	160	4.1	2.2 - 7.4	153
25-34 (1965-1974)	3.6	1.6 - 7.7	218	2.0	0.7 - 5.1	216
35-49 (1950-1964)	2.1	0.9 - 4.9	352	0.3	0.0 - 2.0	348
All ages	3.0	1.9 - 4.6	730	1.6	1.0 - 2.7	718

a - test for heterogeneity of proportions
b - confidence interval
c - approximate birth cohort

Methods for complex survey data (svy commands) in STATA were used to obtain weighted estimates. All individuals who contributed urine specimen were included into analysis, 683 men and 764 women (unweighted count; weighted count: 730 men and 718 women), including 41 men and 38 women (unweighted count; weighted count: 29 men, 22 women), who reported not yet having experienced heterosexual intercourse.

Table A7.1 shows the results of exploratory analysis of association of undiagnosed *Chlamydia trachomatis* infections with selected demographic and social characteristics, and selected sexual behaviour characteristics, which were identified as risk factors in other studies. Except for the statistically significant lower likelihood of infection among the oldest women (35 to 49 years old) in comparison to the youngest (18 to 24 years old), none of the results of these univariate analyses were statistically significant ($p<0.05$).

8. Discussion

8.1. Summary of results

A total of 849 men and 903 women participated and urine specimens were obtained from 685 men and 764 women. Overall survey response rate was 67.0%, 63.3% among men and 70.9% among women. Urine specimens were obtained from 82.7% of respondents, 80.7% of male and 84.6% of female.

The median age at first heterosexual intercourse declined from 18 to 17 years among men born during the late sixties and this was followed by an equivalent decline among women born during the late seventies. The previous gender gap in the cumulative proportions of men and women experiencing first heterosexual intercourse before the age of 17 has closed. A substantial proportion of those who experienced early first heterosexual intercourse regretted it, especially women, and a substantial proportion of these women had been persuaded or even forced into intercourse by their first male partner. There has been a marked increase in condom use during the late eighties and nineties which coincided with a general increase in AIDS awareness. Thus, first heterosexual intercourse remained unprotected against unwanted conception and sexually transmitted infections in only a minority of men and women born most recently. For the majority, first heterosexual intercourse did not occur in the context of a stable relationship and curiosity was the most frequently reported triggering factor for men and increasingly by women. Receiving information on sexual matters in school was associated with decreased risk of early first heterosexual intercourse among women and increased likelihood of condom use among men.

Our results show great variability in the reported numbers of heterosexual partners between individuals of different ages, between men and women, and according to marital status. Men of all ages and any marital status consistently reported higher numbers than women. Mean reported numbers of lifetime heterosexual partners for men and women were 8.3 and 5.6, and means for the past year 1.4 and 1.0 respectively. Annual rates of acquisition of new heterosexual partners were 22.7% for men and 9.5% for women. Rates were higher among younger than older individuals and among previously married or single than married or cohabiting. Having engaged in a concurrent heterosexual partnership in the past year was reported by 13.5% of men and 2.8% of women. During the past five years 12.6% of men and 12.2% of women reported at least one foreign heterosexual partner and 2.6% of men reported paying a woman for sex. Reported frequency of heterosexual intercourse (defined as vaginal, oral or anal intercourse) showed high levels of consistency between men and women. Lifetime experience of vaginal

intercourse was nearly universal and the great majority also reported the experience of oral heterosexual intercourse. Anal intercourse was reported by 31.6% of men and 22.3% of women. Having been forced into heterosexual sex was reported by 12.0% of women. Homosexual attraction and experience were reported rarely and exclusively homosexual behaviour extremely rarely. Only 0.6% of men and 0.4% of women reported at least one homosexual partner during the past five years. Among 18 to 24 year olds, 0.6% of men and 0.4% of women reported having injected illicit drugs during the past five years. All men who had sex with men also reported sex with women and all injecting drug users reported heterosexual sex with non-users.

The prevalence of *Chlamydia trachomatis* infection among 18 to 24 year old individuals was 4.1% and among sexually experienced individuals in this age group 4.7%. However, as 95% confidence limits were wide, the true prevalence could range from 3.0% to 7.3%. Overall prevalence for 18 to 49 year old individuals was 3.0% for men and 1.6% for women.

8.2. Methodological strengths and limitations

We are confident of the methodological strengths of this survey. These included a reliable general population sampling frame, use of well tested and piloted data collection methods, adapted from one of the best national general population sexual behaviour, lifestyles and attitudes surveys ever conducted,[82] high overall response rate, and very high item response rates. We believe that anonymous self-administration of the most sensitive questions contributed to improved validity of self reported information. Weighting ensured good representativeness of our survey sample data for key demographic variables. By means of weighted analyses and use of the survey commands in Stata (version 6.0) we also accounted for the stratified, two-stage sampling strategy, oversampling of young people, as well as differences in response according to key demographic variables. We obtained statistically accurate population estimates and confidence limits for different behavioural patterns. A limitation of our survey was the rather small sample size. Other possible limitations include validity constraints of self reported information, and possible participation biases common to all behavioural surveys. It is possible that some other data collection method, for example CASI, could prove superior in capturing sensitive behaviour information and ensure better internal consistency of self reported information and even higher item response.

The Central Population Registry, which includes basic demographic information on all Slovenian citizens, including those living abroad, institutionalised, and homeless is almost completely up to date and provided an excellent sampling frame. Thus, our probability sample

was highly representative of our reference population. Several other European countries (Belgium, Finland, Norway, and Spain) that have population registries have also used them as sampling frames for sexual behaviour surveys.[33] Some other sampling frames used in similar surveys provide only for incomplete coverage of the general population, which can result in biased estimates. Sampling frames based on households,[29,82,195] would usually exclude individuals living in correctional institutions, college dormitories, homeless shelters, and young men in military service. These individuals may be quite different with respect to current and past sexual behaviour patterns.[196] In comparison to sexual behaviour surveys which have used telephone directory sampling frames, which have been carried out in developed countries[20,24,75,77,78], our sampling frame included individuals without telephones or with extra-directory telephone numbers. Again, these groups may be different with respect to sexual behaviour patterns.[196]

Although participation was entirely voluntary, every attempt was made to increase the response rate. We sent very carefully worded advance letters to all selected individuals to invite them to participate in the survey before the visit of the interviewer, and trained interviewers to provide information and reassurance during the initial contact. Advance letters have been reported to increase participation rates in sexual behaviour surveys.[33] In addition to the information on the subject of the survey, the rationale, and supporting governmental institutions, the invitation letter stressed that for the success of the survey it was extremely important for each invited individual to contribute his or her own attitudes and experiences whatever they may be, and that more intimate information would be collected anonymously. We believed that stressing anonymity in advance of the contact with the interviewer would result in higher participation. Our overall survey response rate (67%) was lower than might have been hoped, but quite acceptable by the standards of similar surveys.

As sampling strategies and sampling frames differ, participation rates are difficult to compare.[33,82,195] In most sexual behaviour surveys conducted in European countries during the late eighties and early nineties, the overall participation rates among those with whom a contact with an interviewer was achieved ranged from 60% to 75%.[33] Our response rate was calculated with a more broadly defined denominator, which included all selected individuals who were never contacted and were assumed to be eligible. In addition, our denominator may have been slightly overestimated, which could have resulted in underestimating our survey response. The reason is that approximately 3% or even more of those individuals who were never contacted, may have lived abroad and were thus not eligible. As this information was not available, we did not exclude them from the denominator. Both NATSAL 1990 and 2000 achieved slightly lower response.[29,82] With respect to FVU specimen collection, overall participation among survey

respondents was 82.7%, which was considered quite high. In comparison, in NATSAL 2000, only 71% of invited respondents contributed first void urine specimens.[133]

The response to most individual questions asked to all participants in our survey either face-to-face or in the self-administered questionnaires was very high (above 98% and 97% respectively) and comparable to the item response in NATSAL 1990.[82] Also, very few respondents who were asked to anonymously complete self-administered questionnaires refused (1.8% of men and 1.0% of women), fewer than in NATSAL 1990.[82]

It has been shown that respondents are more willing to reveal socially censured information in self administered questionnaires or video-CASI than in the face-to-face interview.[82,83] We believe that we further improved the veracity and thus validity of self reported information on higher risk behaviour patterns by providing the possibility of anonymous self administration for the most sensitive questions. Some participants explicitly praised the provision of anonymity in pre-testing and stated that they felt more willing to disclose intimate information. A comparison of information reported face-to-face with that reported anonymously in the self administered questionnaires provided evidence that anonymous self administration captured some higher risk behavioural patterns better than face-to-face interviewing. For example, only half of respondents who reported some homosexual experience in the self-administered questionnaire did so to interviewers. It is interesting, though, that the great majority of those who anonymously reported penetrative homosexual sex, did tell interviewers that they had some homosexual experience. Also, almost one in ten men and one in twenty women, who reported only one lifetime heterosexual partner during the face-to-face interview, reported several in the anonymously self-administered questionnaire. Nevertheless, confidential self administering has been reported as better able to capture sensitive behaviour patterns than face-to-face interviewing[82] and it is impossible to conclude from our results, what was the contribution of anonymity in contrast to confidentiality.

Good comparative data for many important variables in our study, that is population-based estimates for different sexual behaviour lifestyle characteristics in Slovenia, are not available. Thus it is impossible to assess the representativeness of our survey sample in this respect. With weighting[186] we have ensured the best possible representativeness of our survey data with respect to key demographic variables (gender, age, geographic region, and community size and type), which are associated with sexual behaviour lifestyles, especially age and gender. Unfortunately, a good external standard for marital status distribution in the Slovenian general population was not available. If it were, we would also weight our survey data for marital status, as it tends to be strongly associated with sexual behaviour patterns. For example, the data of the

French[197] and East German[33] sexual behaviour surveys were weighted for marital status in addition to other demographic variables. As age is strongly associated with marital status, our weighting for age was also expected to have improved our data representativeness according to marital status. A good population standard for religious affiliation was also unavailable, and will certainly not be available in the near future. Asking about religious affiliation has recently become quite controversial. Collection of information about religious affiliation was planned for the 2002 population census, but the wording of this question had to emphasize the right of respondents not to respond. But, as our results suggest that religious affiliation is much less important in predicting sexual behaviour patterns than marital status, not having weighted our survey data on religious affiliation is not expected to present a problem in the accuracy of our population estimates of different sexual behaviour patterns. It is also reassuring that religious affiliation characteristics of our survey sample and the national Fertility Survey (1995/1996) sample were almost identical. To improve the accuracy of all population estimates, post-sampling adjustments in addition to obligatory weighting to allow for different probabilities of selection have been used in many national sexual behaviour surveys in developed countries. Weighting for the household size to correct only for differential probabilities of selection was used in NATSAL 1990.[82] In NATSAL 2000 they weighted in addition for geographic location (inner London, outer London, rest of Britain).[29] Weighting to correct for differences in the survey samples according to known population characteristics was used in many other similar surveys, however, there are great differences with respect to which variables the data was weighted for. The NATSAL 2000 researchers weighted also for age and gender,[29] the French for age, marital status, occupation, and region,[197] those in East Germany for age, gender and marital status, and in Germany for age and gender. The Scottish survey data were weighted for occupation and phone ownership, the Belgian, Portuguese, and Swiss for geographic regions[33] and the data of one of the US national general population sexual behaviour surveys for household size, age, gender, race and ethnicity, region, and marital status.[198]

It is widely assumed that people will be reluctant to tell the truth about aspects of their sexual experience.[199] In addition to possible problems with veracity, the validity of self-reported sexual behaviour is open to question because of failures in accuracy when reporting and also because of problems with recall.[196,200,201] Misreporting of sexual behaviour has been reported.[202-204] As stated above, we believe that we improved the veracity and thus validity of self reported information by providing the possibility of anonymous self administration for the most sensitive questions. Extensive developmental work involved in the design of the questionnaire used in the NATSAL 1990 survey, which we adapted for our survey, was aimed at increasing the validity of self reported information in many ways, including the provision of definitions for certain terms, careful wording of questions, considering the order effect in which points on rating scales

might best be listed to elicit the most reliable responses, and aiding the process of recall by the appropriate sequence of questions[199]. We believe that, by providing definitions for certain terms, like oral, vaginal, and anal intercourse, we contributed to more correct and consistent use of these terms. Imprecise wording of questions has been implicated in contributing to validity problems of self-reported sexual behaviour information.[203] However, some problems related to people's ability to recollect their experiences and report them accurately are inevitable, and yet only 2.3% of all men were unable to remember the age of their first heterosexual partner. The corresponding proportion in the oldest group interviewed (born during 1950-1964) was 4.4%, reflecting the increasing problem of recall with the time distance from the event. Also, there was evidence of some inconsistencies in information reported in the self administered questionnaires which undoubtedly pointed to some minor problems with the validity of self reported information.

Participation bias has the potential to introduce significant error in estimates of behavioural risk. Possible participation biases could have resulted in our underestimating proportions of individuals with particular higher risk behavioural patterns, that tend to be less acceptable by the majority of the population or even stigmatised, for example, the proportion of homosexually active males. Preparedness to disclose such behaviour may be low and could result in a higher likelihood of individuals with such behavioural patterns refusing to participate. We tried to prevent this by stressing in the invitation letters that the most intimate questions would be answered anonymously in self-administered questionnaires. We also instructed interviewers how to, during the initial contact with selected individuals, reinforce the point that for the success of the survey it is extremely important, that each invited individual contributes his or her own attitudes and experiences whatever they may be. Nevertheless, intuitively, it seems quite possible that a man, whose homosexual sexual lifestyle is hidden, would be less likely to participate, especially if distrustful of societal attitudes towards homosexuality in general and worried about breaches of anonymity. In contrast to our concerns, it was suggested that non-reluctant respondents and reluctant respondents, possibly indicating differences between respondents and non-respondents, are not different with respect to sexual attitudes, experiences and practices[195,205]. It was also suggested that non-participants could be at a generally lower risk of HIV infection than respondents and that estimated proportions of the population with homosexual experience based on respondents alone should be regarded as probable overestimate.[206]

One of the limitations of our survey was the rather small sample size. Thus, many of our estimates of different sexual behavioural patterns are less precise than we desired, and many exploratory analyses with which we wanted to identify different risk or protective factors for

higher risk behaviour patterns of interest lacked power. Also, we were not able to describe behavioural, and attitudinal characteristics of population groups with behavioural patterns known to be associated with increased risk for HIV or STI, for example, of men who have sex with men, as numbers of such respondents were too small. Probably the most regrettable consequence of our rather small sample size was that our prevalence estimates of *Chlamydia trachomatis* infection in different age groups of men and women lacked the desired precision. More precise estimates would make our survey results much more useful for informing consultations about introducing screening for asymptomatic infections.

Studies comparing CASI with pencil and paper for self-administration of identical questions demonstrated the potential of CASI to improve the quality of data and to increase respondents' willingness to report sensitive behaviours.[196] In contrast, the pilot study for NATSAL 2000 found no consistent evidence of CASI increasing reporting risk behaviour when compared to pencil and paper self-administration of the same questions, but did demonstrate improved item response and data consistency.[86,207] Audio-CASI has been reported to be superior in capturing sensitive sexual behaviour information and injecting drug use information in the US adolescent population in comparison to pencil and paper self-administering technique[84] and also in capturing HIV risk behaviour among injecting drug users in comparison to CAPI and CASI.[85] Our scant resources made it impossible for us to even consider this approach. However, piloting CASI or audio-CASI and comparing it to pencil and paper self administering technique should be considered within preparations for any future national sexual behaviour survey in Slovenia.

8.3. Limitations in international comparisons

Numerous methodological differences between national general population sexual behaviour surveys may result in poor comparability of published results. These may include differences in eligibility criteria for individuals and sampling frames used, differences in fieldwork timing resulting in different birth cohorts of individuals surveyed, differences in participation rates and possible participation biases, differences in data collection methods used, lack of or differences in definitions of terms used, differences in wording of questions, and different interpretations of the same wording of questions resulting from cultural differences. In addition, differences in the denominators used for behaviour patterns prevalence estimates (e.g. all individuals surveyed, ever sexually active, those in steady relationships) make comparisons more difficult.

Simple comparisons of summary results of surveys conducted in different time periods ignore the possibility of secular changes in behavioural patterns. For certain comparisons, for example, for once in a lifetime events, like first heterosexual intercourse and circumstances surrounding it, such constraints can be avoided by limiting comparisons to the same birth cohorts. Or differences in participation biases could lead to wrong conclusions that particular minority behavioural patterns that tend to be more stigmatised in certain societies are less prevalent in these societies in comparison to other more tolerant societies, as preparedness to disclose such behaviour may vary substantially according to societal attitudes and norms. Or different data collection approaches may result in different sensitivity in assessing proportions of individuals with uncommon or stigmatised behavioural patterns and thus distortion in comparisons.

International comparison of the results of national general population sexual behaviour surveys will always be attempted, but, conclusions about similarities and differences require caution. To overcome some of the problems in comparisons of European sexual behaviour surveys[33] the European concerted action »Sexual behaviour and Risks of HIV infection in Europe« supported by the European Commission was initiated.[185] When adapting our questionnaires from NATSAL 1990 survey questionnaires[26] we also ensured partial comparability with this concerted action list of suggested variables and respective categories. However, our survey results are most comparable to the results of NATSAL 2000,[29,31,133] as both surveys were conducted during the same time period, and used very similar data collection methods.

8.4. First heterosexual intercourse

Our results lack historical depth with respect to the marked reduction in age at sexual initiation that occurred over the second half of the twentieth century. National sexual behaviour surveys conducted in many European countries during the early nineties, that enrolled cohorts of individuals born from the thirties onwards, have shown that between women who started their sex lives in the fifties (born in the thirties) and those who started in the nineties (born in the early seventies) median age at first heterosexual intercourse has fallen by at least two years and in some countries even by as much as four years.[79,208] Among the birth cohorts surveyed in our study (born between the fifties to early eighties), the median age at first heterosexual intercourse declined from 18 to 17 years among men born during the late sixties and this was followed by an equivalent decline among women born during the late seventies. Very similar results were reported by the national Fertility Survey (1995/1996) except for a lower median age at first heterosexual intercourse for men and women born during the late seventies (16 years), which

might be a biased underestimation and might have occurred as a consequence of including only sexually experienced young people in calculations.[8] The median age of first heterosexual intercourse among secondary school pupils was 17 years in the survey conducted in Ljubljana in 1994[209] and also in the national survey conducted in 1995/1996.[210] Restricting comparisons to the same birth cohorts the median age at first heterosexual intercourse for Slovenian men tended to be slightly higher than, and for Slovenian women about the same as or slightly higher than in most European countries. Slightly higher median ages for men were reported from Finland, Norway, and Switzerland, and slightly lower from Denmark, France, Iceland, Portugal, UK, and Athens; and for women, slightly lower from Denmark, Finland, West Germany, UK, Iceland, and Norway and higher only from Portugal and Athens.[208]

In contrast to the decrease in the median age at first heterosexual intercourse, our Kaplan Meier survival analysis, looking at cumulative proportions of respondents having experienced first heterosexual intercourse at each age and the results of Log rank tests for the equality of the survival functions, provided no evidence for a substantial overall decline in the age at first heterosexual intercourse with successive surveyed birth cohorts among men and only borderline evidence for a decline among women. But, focussing only on first heterosexual intercourse before the age of 17, there has been an evident decline in the age at the event among women born most recently. Consequently, the previous gender gap in the age at first heterosexual intercourse (before the age of 17) among those born during the fifties, sixties and early seventies, has closed completely among young individuals born during the late seventies and early eighties. In this respect our results are quite similar to many European countries where men and women tend to experience their first heterosexual encounters at roughly the same age (Belgium, Denmark, West Germany, Iceland, Netherlands, Norway, Switzerland, and the UK).[31,208]

Age at first heterosexual intercourse is a powerful indicator of the characteristics of adult sex life.[208,211] European general population probability sample sexual behaviour studies found early first heterosexual intercourse (before the age of 16) to be associated with early pregnancy[31], multiple partnerships in all age groups,[208,211] more frequent sexual intercourse later in life[208], higher likelihood of having experienced anal intercourse,[208] and STI.[212,213] Clearly, under age sex is a risk factor for a range of adverse outcomes[214]. Our results show that early first heterosexual intercourse has recently become more common among women in Slovenia, thus becoming approximately as common as it has been among men. Among individuals born during the late seventies and early eighties, already one in six men and one in seven women experienced early first heterosexual intercourse, and one in 15 men and one in 20 women very

early first heterosexual intercourse (before the age of 15, the age of consent in Slovenia). Very similar estimates were reported by the national Fertility Survey (1995/1996).[8]

Looking at the proportion of individuals that experienced early first heterosexual intercourse (before the age of 16), it was higher in the UK, reported by more than one in four men and women, but previous trends towards earlier first heterosexual intercourse seem to have stabilised during the nineties.[31] Also, comparing only birth cohorts born since the fifties and before the early seventies, corresponding proportions were much lower in Slovenia than in most European countries (Belgium, Denmark, Finland, France, West Germany, UK, Iceland, Netherlands, Norway), with the exception of Belgium and Switzerland. However, trends towards earlier first heterosexual intercourse reported from many European countries have stabilised during the eighties,[208] and considering the recent increase in early first heterosexual intercourse in Slovenia, many of these differences may have become smaller or disappeared.

Women who reached their physical sexual maturity sooner (menarche before the age of 13), and lived in one of the two biggest cities were at a higher risk of early first heterosexual intercourse, while higher attained educational level and acquiring most knowledge about sexual matters from authoritative sources such as parents and school had a protective effect. The only risk factor for early FHI among men in our study was related to disrupted family structure in their childhood and early adolescence. Similar unfavourable effect of the disrupted family structure[31] and favourable effects of higher education and receiving information about sexual matters in schools were reported by other European studies.[31,208] Interestingly, in contrast to some other European countries[79,208] our results failed to show any evidence that Roman Catholics were less likely to experience early first heterosexual intercourse than those without religious affiliation.

The marked increase in reported risk reduction practices at first heterosexual intercourse is very encouraging. Only a minority among young Slovenian men and women born most recently still experience first heterosexual intercourse without protection against conception and sexually transmitted infections. The increase in condom use during the late eighties and nineties has been striking. Among the youngest men and women, who were born during the late seventies and very early eighties, already approximately two in three reported having used a condom at first heterosexual intercourse. Almost identical estimates for individuals born during the late seventies were reported by the national Fertility Survey (1995/1996).[8] Marked increase in condom use at first heterosexual intercourse[30,31,208] and in general[24,215] has also been reported from other European countries and the US.[216] However, one study from a central European country, reported that a condom was used in less than one in three occurrences of first heterosexual intercourse among young Czech women.[217] It is impossible to conclude from the

results of our survey or from other available information, what factors contributed to this increase in condom use at first heterosexual intercourse in Slovenia. But, it is a fact that the increase coincides with the general increase in AIDS awareness, and that numerous AIDS related campaigns, mostly promoting condom use, were targeted to the general population and especially to youth. The first national AIDS related campaign was targeted to the general population in 1986,[218] which was relatively early given that a cumulative total of only two AIDS cases had been reported in Slovenia by the end of 1986.[15,17] Also, in contrast to many other European countries, that recently stopped mass media campaigns with AIDS-linked safer sex messages, Slovenia has continued to implement two AIDS campaigns per year.[218] In addition to general media advertising, safer sex promotion and HIV and STD information leaflets have been distributed in schools annually. Safer sex promotion and HIV and STD information leaflets have also been designed for populations at higher behavioural risk and distributed to men who have sex with men and to injecting drug users, the latter also including injecting drug use related harm reduction messages.[218] Whatever the reasons, the trend is very favourable.

Men who received information about sexual matters in school and those with the highest education were more likely to use a condom at first heterosexual intercourse. Other European studies also showed a similar beneficial effect of sexual education in schools[27,31] and higher education.[27,79,208] Not surprisingly, those men who reported not being in control at the event as they were carried away by their feelings or drunk were less likely to use a condom. Also, first heterosexual intercourse was more likely to be unprotected against unwanted conception and sexually transmitted infections if it occurred before the age of 16, as reported by others.[27,31,219] Among other methods used to prevent unwanted conception during recent decades, withdrawal declined substantially, while the use of the pill has remained relatively stable. In contrast to our results, in some European countries the increase in condom use has been reported to have occurred at the expense of pill use.[208]

With respect to the circumstances of first heterosexual intercourse our results are less optimistic. Curiosity was the most frequently reported triggering factor that led to first heterosexual intercourse for men and also increasingly for women, especially for those with early experience. For the majority of young men and women, first heterosexual intercourse did not occur in the context of a stable relationship as reported from other European countries[79,208], however, it did occur with someone known for some time. In contrast to our results, being in love was the most frequently reported reason for first heterosexual intercourse in the national survey of secondary school pupils in Slovenia (1995/1996).[210] Men were more likely to have had first heterosexual intercourse with someone they had just met or had only met recently, but very rarely with a prostitute. Male initiation through prostitution has almost disappeared in other European

countries also.[79,208,220] Not surprisingly, the older the respondents were, the more likely they were to have experienced the event within the context of natural development of a relationship. The same finding was also reported from the UK.[79] For almost one in two men and approximately one in three women the event was neither planned nor anticipated, but just happened on the spur of the moment. Similarly as in the UK, more planning and less spontaneity appeared to be associated with first heterosexual intercourse for individuals born more recently, especially for women and individuals who were a bit older when it happened.[79] However, in contrast to the UK study,[79] not having planned first heterosexual intercourse was not found to be associated with not using contraception.

Although a great majority of respondents and especially those for whom the event occurred at a more mature age, recall their first heterosexual intercourse as an event that was wished for and well timed, it is of concern that quite a sizeable minority of women reported that they had regretted it happened, and many that they had not wished it to happen but had to be persuaded. Early first heterosexual intercourse (before the age 16) was regretted by almost one in five men and approximately one in two women. In general, coercion was rare, but, it is worrying that very young women, before even reaching the age of consent (15 years), reported having been forced more frequently (more than one in six), and that an additional one in three had to be persuaded. Increasing regret with decreasing age at first heterosexual intercourse was also reported by others[31,221]. In general, women more often regret their first heterosexual intercourse and are less willing than their partner.[31,213,221,222] Our results certainly indicate very serious gaps in skills to avoid unwanted early first heterosexual intercourse and to negotiate delaying initiation into penetrative sex that is not yet desired among a substantial proportion of young men and especially women.

It is quite unacceptable, that approximately three in four young people perceived themselves as inadequately prepared in terms of knowledge about sexual matters at the time of their first heterosexual intercourse, a similar proportion to the UK.[27] Approximately one in three men and one in two women felt that they lacked knowledge about contraception and almost one in two men and approximately one in three women about sexually transmitted diseases.

The majority of those who reported such lack of knowledge expressed a preference for more authoritarian sources of sex related information. The majority would like to learn more from their parents, especially mothers, but a substantial proportion also from school and health care institutions. Similar findings were also reported from the UK.[27] In our survey, receiving information on sexual matters in school has been associated with decreased risk of early first heterosexual intercourse among women and increased likelihood of condom use among men.

Interestingly, in the UK, school reported as the main source of information about sexual matters was associated with decreased risk of early first heterosexual intercourse among men, and increased likelihood of condom use among women.[31] To design an intervention to promote more active parental role in providing information and advice about sexual matters would be quite challenging, but, the development of well designed sexual and reproductive health and life skills programmes for primary school education integrating HIV and STI related issues should be a high priority[223,224]. Young people should be taught not only about the biomedical aspects of reproductive health but should also learn how to cope with the increasingly complex demand of relationships, based on the life-skills approach. In addition to issues relevant to preventing unwanted, and delaying premature first heterosexual intercourse, prevention of unwanted conception and sexually transmitted infections and relevant gender issues should be included[225,226]. Appropriate standard sets of teaching tools should be developed or adopted from those already available[223,227-229] to be used in the Slovenian context. From the public health perspective, a reproductive health life skills school education programme is a rather feasible intervention and very importantly, one that can ensure the greatest possible coverage. It should begin at the earliest possible age and certainly before the age at which a substantial proportion of young individuals become sexually active.

8.5. Sexual partnerships, practices, and HIV risk behaviour

Our results show great variability in the reported numbers of heterosexual partners between individuals of different ages, between men and women, and according to marital status. Older respondents had accumulated higher numbers of heterosexual partners than younger who had less time to acquire so many. However, women born more recently have accumulated relatively high numbers of male partners already at a younger age, in comparison to those from earlier cohorts. Men of all ages and any marital or partnership status, consistently reported higher numbers of heterosexual partners over all time periods than women in corresponding groups, as also reported by others.[29,211,220,230-232] Different possible explanations for this gender discrepancy were suggested. Male respondents may have more partners outside the surveyed population than female (e.g. abroad or outside the age range surveyed), and may have female partners with very high numbers of other male partners who may be underrepresented in the sample (e.g. commercial sex workers).[211,232] Gender differences can also result from a higher proportion of single men than women in the sample, as women marry or start cohabiting at younger age and tend to choose older partners.[8,29] It was also suggested that this is partly due to social and cultural factors resulting in differential reporting between genders.[211,232]

High number of sexual partners has been associated with increased risk for HIV and other STI.[36,37] Lower mean numbers of lifetime heterosexual partners were reported by Slovenian men and women (8.3 and 3.2 respectively) than in all other European countries for which the information was available. The mean numbers of lifetime partners for men ranged from 11.7 in Switzerland to 19.7 in the Netherlands, and for women from 3.8 in France to 6.0 in the Netherlands.[232] Correspondingly, the proportion of individuals with ten or more lifetime heterosexual partners was also lower in Slovenia (reported by one in four men and one in 20 women).[232] In the UK, the corresponding proportions were approximately one in three men and one in five women,[29] however, comparing only the youngest individuals (under 25 years old), there is no difference between Slovenian and British men, but a difference between women (approximately one in seven youngest English women reported to have accumulated at least 10 heterosexual partners).[29] As, in contrast to our survey, 16 and 17 years old individuals also participated in the UK survey, the true difference between the two young female populations might even be larger, as the youngest English women would have had less time to accumulate higher numbers of partners, resulting in a slightly lower estimate for the whole group. If we only compared our results to NATSAL 1990, our conclusions would be quite different. The assessed proportion of individuals with at least ten lifetime heterosexual partners in the UK was lower then[211] than a decade later, reflecting recent increase and maybe partly also changes in the survey methodology or in respondents' willingness to report socially censured behaviours.[29] But, proportions of individuals with at least 10 lifetime partners reported by similar European surveys conducted approximately a decade earlier than ours were already much higher. To have accumulated at least 10 lifetime partners was reported by approximately one in three men in the Netherlands, Norway, and Switzerland, and by even higher proportions of men in Finland, France, and Spain, and by approximately one in thirteen women in the Netherlands, one in eight in France, and more than one in six in Finland, Norway, Spain, and Switzerland.[232]

In contrast to marked differences in the mean numbers of lifetime heterosexual partners, the Slovenian mean numbers of heterosexual partners in the past year (1.4 for men and 1.0 for women) were closer to those reported from other European countries (for men ranging from 1.2 in the Netherlands to 1.8 in Portugal and for women from 1.0 in Belgium, and Portugal to 1.2 in Norway). Also, the differences in the proportion of individuals with multiple (at least two) heterosexual partners in the past year (reported by approximately one in five Slovenian men and one in 15 women) were smaller. In fact, the proportion for Slovenian men tended to be slightly higher than, and among women about the same as in most European countries about a decade ago (higher proportions were reported only from Finland, Norway, and Spain).[211,232]

Early first heterosexual intercourse and being single or previously married, in contrast to being married or cohabiting, increased the likelihood of having multiple heterosexual partners in the past year and also the likelihood of accumulating at least 10 lifetime heterosexual partners, as also reported by others.[208,211,232] There was no evidence that individuals with higher education were more likely to report multiple partners during the past year, as reported by some European surveys,[232] however, Slovenian women with higher education were more likely to accumulate at least 10 lifetime heterosexual partners than those with lower education. Also, there was no evidence that individuals in cohabitation were more likely to report multiple partners during the past year than those married in contrast to the findings in the UK.[211]

Rate of partner change is one of the crucial parameters in determining the spread of HIV and other STI.[62] To have formed at least one new heterosexual partnership in the past year was reported by almost one in five men and approximately one in ten women, similar to estimates from the French survey.[220] These are lower rates than those estimated in the UK (approximately one in three men and one in five women).[29] New heterosexual relationships were formed more frequently by younger than older individuals, by men of all ages than women, and by single or previously married than married or cohabiting, as expected and also reported by others[29,220]. Interestingly, among men, new partner acquisition rates were highest among previously married (1.3), and among women, among those who were single (0.4).

Having concurrent partnerships has been associated with increased risk for HIV[61], and frequency and types of concurrent partnerships were suggested to be among the crucial parameters determining the spread of HIV and STI.[61,69-71] Having ever engaged in concurrent heterosexual partnership was reported by 35.3% men and 15.3% women, and in the past year by 13.5% of men and 2.8% of women. The corresponding proportion for one year period was almost identical for men in the UK, but much higher for women (9.0%).[29] The proportions of those with concurrent relationships in the past year were estimated for individuals in steady relationships for at least a year in several European surveys. These proportions ranged from 6.5% in Netherlands to 21.6% in Portugal for men and from 2.6% in the Netherlands to 5.6% in Norway for women. However, both the numerator and denominator were defined differently and these results are not comparable with ours.

For people from low HIV and STI prevalence countries, engaging in sex with foreigners from higher prevalence countries or while travelling or living in such countries increases the risk.[59,60] The recent increase in reported syphilis incidence rates in Slovenia was associated with having heterosexual sex abroad, most often in the Russian Federation or one of the newly independent states[233]. Our results provide a crude estimate for the extent of sexual mixing with foreigners.

More than one in five individuals reported at least one foreign heterosexual partner ever, and for more than one in ten, this happened in the past five years. A substantial proportion of these foreign partners were casual partners and, for men, a small proportion were commercial sex workers. In retrospect, regrettably, more detailed information about characteristics of these foreign partners was not asked, but it was evident that only a very small proportion of such contacts occurred outside Europe, thus not in countries with generalised HIV epidemics.[224] Recent estimates for proportions of men and women with at least one new partner from outside the UK during past five years were 14% and 7% respectively, suggesting a difference between genders, which was not apparent in our results.[29]

Increased risk for HIV or other STI includes having sex with a partner with many other sexual partners or a partner from a "core group" like a commercial sex worker.[44,45] Having ever paid a woman for sex was reported by 4.4% of men, and to have done so within the past five years by 2.6%. In all other European countries for which the information was available a decade ago, the corresponding proportions for lifetime prevalence were higher, ranging from 6.8% in the UK[211] to as high as 38.1% in Spain.[232] Higher proportions of men who paid women for sex during the past five years were reported from France[220] and the UK.[29] From the perspective of higher risk in engaging in sex with foreigners from higher prevalence countries it is important to note that among Slovenian men who ever paid women for sex, approximately three in four reported paying a foreign commercial sex worker, and that within the total number of reported paid female partners, more than two in three were foreigners. Regrettably, more detailed information about their origin is not available. Overall, a very low proportion of respondents, less that 1%, reported having been paid for sex, but it is of concern that the proportion among the youngest women (18 to 24 years old) was higher (1.6%) indicating a recent increase in selling sex among women.

In contrast to marked gender differences in the reported numbers of partners, men and women showed high levels of consistency in the overall pattern of reported frequency of heterosexual intercourse, as also reported by others.[29,220,234,235] The median reported numbers of heterosexual intercourse occasions in the past four weeks were 5 for both genders, and the mean numbers 6.1 for men and 6.0 for women. These means tend to be slightly lower than those reported from the UK,[234] however, we used all respondents as the denominator and the results from the UK were published for individuals with at least one heterosexual partner in the past year.[29] The means for frequency of heterosexual sex among individuals in steady relationships reported from other European countries ranged from approximately 6.5 to 10.2.[235] Since being married or in cohabitation implicates the availability of a regular sexual partner, quite expectedly, the overall

frequency of occasions of heterosexual intercourse was by far the highest among these individuals, again, also reported by others.[234]

Experience of vaginal intercourse was nearly universal by the age of 25. Approximately three in four individuals reported the experience of heterosexual oral intercourse, but it was clearly practised less frequently. Lifetime experience of heterosexual anal intercourse was reported by 31.6% of men and 22.3% of women, and in the past year by 19.2% of men and 13.5% of women, suggesting that it is more common in Slovenia than in some other European countries (the UK, the Netherlands and Norway).[29,234,235]

Coercion into sexual intercourse was not uncommon, 12.0% of women reported having ever been forced, and 2.0% during the past year. Having ever been forced was reported less frequently in the French survey.[236] A recent worldwide overview of population-based surveys reported that between 10% and 69% of women reported physical assault by intimate male partners, and summarised information from three national population-based European surveys (corresponding proportions were 14% in the Republic of Moldova and 21% in the Netherlands and Switzerland).[237] As definitions of physical assault varied between countries and only included sexual assault, these results are not comparable to ours, but nevertheless, give some indication that the magnitude of the problem of women being forced into sex by men in Slovenia, although substantial, might be less serious compared to most countries.

Homosexual attraction and experience were reported rarely (experience by 3.3% of men and 3.6% of women) and exclusively homosexual behaviour was extremely rare. Only 1% of men and women alike reported experience of oral or anal homosexual intercourse. In contrast, other European surveys reported homosexual sex among men to be much more common, ranging from 5.2% in Norway to 13.4% in the Netherlands.[23,238] Among women, the corresponding proportions ranged from 1.3% in France to 6.3% in the Netherlands,[23,238] closer to our estimates. The only country with lower estimates was Portugal, with a lifetime prevalence of 0.9% homosexual sex among men and 0.8% among women. In contrast to our results and recent results from the UK[29] in many European countries, men reported homosexual sex more frequently than women.[232,238] Differences in wording of questions and possible differences in the interpretation of terms used (e.g. "homosexual sex", "sexual contact with..."), result in difficulties in discriminating penetrative from non-penetrative homosexual sex, making comparisons between countries difficult. For most Slovenian men and women, homosexual experience involved only one lifetime homosexual partner. Homosexual partners during the past five years were reported by 0.6% of men and 0.4% of women, which is a much lower proportion than in the UK.[29] Again, participation bias or dishonest reporting of socially

censored homosexual sex might have contributed to this rather low estimate of the proportion of homosexually active population group in Slovenia. With respect to the potential for HIV infection transmission from men who have sex with men, currently the most affected population group in Slovenia,[16,17,218] to the heterosexual population, it is important that all these men were bisexual and most married or cohabitating with a heterosexual partner. This is also consistent with the observation that homosexual experience is often concentrated in adolescent or early part of adult life, and either cease or continue in parallel to heterosexual life thereafter.[232] Limited behavioural surveillance information from a small convenience sample of "core group" of men who had sex with men in 2001 indicates that approximately 15% also had sex with women (unpublished information of the IPHRS). Targeted behavioural surveillance surveys among men who have sex with men would contribute to the monitoring of trends of a few key behavioural indicators, informing development of preventive interventions targeted to this group and obtaining more information about behavioural links with the general population.[5,96,239] Testing for HIV and other STI biological markers should be integrated.

Having ever injected illegal drugs was reported by 0.3% of men and 0.1% of women, which is lower than reported from similar European surveys,[29,240] but, among the youngest (18 to 24 years old), 0.6% of men and 0.4% of women reported injecting illicit drugs during the past five years, which is closer to estimates from other European countries.[240] One in four of these individuals reported having ever shared injecting equipment. With respect to the potential for HIV transmission through unprotected sex from injecting drug users to non-users, it is important that all these individuals reported higher than median number of lifetime heterosexual partners and that none reported having known any of their most recent heterosexual partners having ever injected illicit drugs. Also, among 18 to 24 years old individuals, who reported not having ever injected illegal drugs, 3.0% of men and 3.8% of women reported having had heterosexual sex in the past five years with someone with a history of injecting illicit drugs. Targeted behavioural surveillance surveys among injecting drug users would contribute to the monitoring of trends of a few key behavioural indicators, informing development of preventive interventions targeted to this group and obtaining more information about behavioural links with the general population.[5,97] Testing for biological markers should be integrated.

Our results presents the first national general population probability sample estimates for many sexual behaviour patterns associated with increased risk for HIV and STI transmission. Two previous fertility surveys,[6-8] having had different objectives, did not collect such information. Since substantial changes in sexual behaviour patterns can occur over a short period of time[29] and up to date information is needed to inform public health interventions to improve sexual health, we hope that we can conduct another similar national sexual behaviour survey after a

decade. In the mean time, possibilities to attach a shorter sexual behaviour module to any large scale probability sample health related general population survey in Slovenia should be explored.

8.6. *Chlamydia trachomatis* infection

Our results present the first Slovenian national estimate of the burden of *Chlamydia trachomatis* infection in a probability sample of the general population. Prevalence is substantial, especially among the young; our estimate for 18 to 24 year old individuals, men and women alike, was 4.1%, and for the sexually experienced in this age group 4.7%. However, the true prevalence in this latter population could easily be anywhere between 3.0% and 7.3% (CI_{95}). Overall prevalence for 18 to 49 year old individuals was 3.0% for men and 1.6% for women, but the difference between genders could have arisen by chance.

We are confident that the type of specimens we collected (FVU),[148] freezing specimens on the day of collection for storage, maintenance of cold chain during transport to the laboratory, and testing thawed specimens with PCR, all ensured high sensitivity and specificity of our laboratory results. Both PCR and LCR have been well evaluated for both urogenital swab and FVU specimens with sensitivity generally over 85% and specificity of 99 to 100%.[148,154-158] Freezing and thawing before testing FVU specimens was reported to improve the sensitivity of PCR.[169,171] To circumvent the possible problem of FVU specimens containing inhibitors for PCR assay[161,163,164] and ensure the integrity of negative results, we used the internal control to identify inhibitory specimens incorporated in the Amplicor PCR kit.[167,168] We assume that, although we tested in pools of five, the sensitivity was not affected, as reported by others.[175-177]

Meaningful comparisons with other published *Chlamydia trachomatis* infection prevalence results from Slovenia are rather limited. Four Slovenian studies of convenience samples of asymptomatic females (at family planning clinic, the University Clinical Centre Ljubljana, and Gynaecology Hospital Ljubljana) reported prevalence ranging from 6% to as high as 16.5%[135,140-142] and two studies of convenience samples of asymptomatic men at an occupational medicine clinic in Celje reported a prevalence of 3.2% among 18 to 45 year old patients[137] and 2.7% among military recruits.[143] Regretably, none of these studies published age-specific *Chlamydia trachomatis* infection prevalence estimates nor detailed information on age and other characteristics of participants. But it is clear that less than optimally sensitive laboratory tests were used in most, which might have resulted in underestimated prevalence estimates for these particular population groups.[134]

In comparison to the only other general population probability sample survey conducted in an European country which assessed *Chlamydia trachomatis* infection prevalence (to our knowledge), NATSAL 2000, our *Chlamydia trachomatis* infection point prevalence estimates among 18 to 24 years old men and women are higher than in the UK (2.7% for men, 3.0% for women).[133] However, the researchers from the UK anticipated that their prevalence estimates might have been underestimations, as some loss of sensitivity might have occurred as a result of specimen transport delays in the post.[133] The UK general population gender and age-specific prevalence estimates also lacked precision. In fact, all gender and age-specific point prevalence estimates they published are within 95% confidence limits of our corresponding prevalence estimates.[133]

Given the power of our study, our exploratory analysis of the association of *Chlamydia trachomatis* infection with selected demographic, social, and sexual behaviour characteristics which were identified as risk factors in other studies, did not identify any statistically significant associations, except for the lower likelihood of infection among the oldest women (35 to 49 years) in comparison to the youngest (18 to 24 years). The demographic factor found in other studies to be most strongly associated with *Chlamydia trachomatis* infection was age of below 20 years and somewhat less strongly associated, age below 25.[108,113,122,241-249] In addition, associations with numerous demographic, social and behavioural characteristics were reported in studies of different populations seeking health care. Demographic and social risk factors include ethnic group,[108,113,123,243,245,246,250-252] lower school leaving age,[113] lower socioeconomic status,[108] urban[252] and inner city residence,[108] being single,[113,243] and nulliparity.[113,243] Behavioural characteristics include younger age at first intercourse,[244] frequency of intercourse,[251] number of lifetime sexual partners,[251-253] new sexual partner in the recent past,[113,123,247] more then one partner in the recent past,[123,242,243,245,246] partner with multiple sexual partners,[123] no use of barrier contraception,[123,245,250,253,254] and vaginal douching.[243,255] History of previous infection[253] and a symptomatic partner[123,242,244,245,247,253] were additional reported predictors of *Chlamydia trachomatis* infection. Associations with demographic, social and behavioural factors found in some studies were absent in others. The protective role of barrier contraceptive methods and increased risk when using oral contraception is one example.[254] Risk factors for *Chlamydia trachomatis* infection identified in NATSAL 2000 in the UK were: at least two partners and at least one partner with whom condom was not used in the past year for men and women alike and in addition to these two, at least one new partner and a concurrent partner in the past year for men only.[133]

Slovenia has not yet agreed upon a national *Chlamydia trachomatis* infection prevention and control policy that would include screening for asymptomatic infections.[108,113,249,256-262] Numerous arguments suggest that this gap should be filled. Evidence has been accumulating from observational studies that testing and case management programmes are effective in decreasing Chlamydia trachomatis infection prevalence[124,249,263] and incidence[259] as well as incidence of PID.[249,259] Convincingly, a randomised controlled trial reported a 56% reduction in PID incidence in the screened group in comparison to the usual-care group.[264] Screening programmes are claimed to result in significant public health cost savings.[247,265-269] Highly sensitive and specific DNA amplification tests to diagnose *Chlamydia trachomatis* infection have become available. Conveniently obtained FVU specimens can be used for laboratory diagnosis. This permits extension of testing beyond health care facilities where gynaecological examinations are performed and urethral swabs are routinely obtained, into other health care settings,[113,270,271] and even into the community,[246,272] to screen for infections in asymptomatic individuals who would not seek clinical care. Even home based self collection of urine with specimens mailed for testing has been reported not to impair laboratory diagnosis.[273] And finally, availability of single oral dose treatment with azithromycin ensures high cure rates[274,275] and provides a possibility to circumvent potential problems with compliance.[276]

The development and implementation of a national strategy for the prevention and control of *Chlamydia trachomatis* infection, most likely the most common curable STI in Slovenia, should be an immediate public health priority. An expert advisory group should be appointed by the Ministry of Health to prepare recommendations for such a strategy. The group should collate available information on the prevalence of *Chlamydia trachomatis* infection in the population, consider cost-effectiveness of introducing screening for asymptomatic infections, and identify additional information needed to guide such a strategy, and recommend how to obtain such information.

Regrettably, our rather imprecise prevalence estimates of asymptomatic *Chlamydia trachomatis* infection in different age groups of men and women make our survey results less useful for that purpose than desired. Possibilities should be explored to integrate testing for *Chlamydia trachomatis* infection in any future general population probability sample surveys. Conducting a national *Chlamydia trachomatis* infection survey in general practices and gynaecologist outpatient services within primary health care should be considered. Also, efforts to improve the quality of *Chlamydia trachomatis* infection surveillance information based on universal mandatory reporting[277] and setting up a national STI sentinel surveillance network in a convenience sample of general practices and gynaecologist outpatient services within primary health care should be continued.

9. Conclusions and recommendations

This thesis reports the design and execution of, and results from the first national general population probability sample survey of sexual behaviour and the prevalence of *Chlamydia trachomatis* infection in Slovenia.

Results show wide variability in sexual lifestyles and provide the first national estimates for behavioural patterns that are key determinants for sexual health. Reported prevalence of many behavioural patterns associated with increased risk for HIV and STI transmission, including high numbers of lifetime heterosexual partners, new heterosexual partner within the past year, concurrent heterosexual partnerships, paying for sex, male homosexual partnerships, and injecting drug use is either lower than in other European countries for which information is available or among the lowest. The rather common practice of heterosexual anal intercourse in Slovenia is one exception. First heterosexual intercourse remains unprotected against unwanted conception and STI in only a minority of young individuals, as a striking increase in condom use occurred. Less optimistically, many young individuals lack knowledge about contraception and sexually transmitted infections at the time of the first heterosexual intercourse and that a substantial proportion experience it early, which is often regretted, and among women often even against their will. It is of concern that a significant burden of *Chlamydia trachomatis* infection in the population was found.

The results presented in this thesis and those of future analyses are expected to contribute to the understanding of HIV and STI epidemiology and to inform reproductive health policies and strategies as well as HIV and STI prevention and control in Slovenia. In addition, the results are expected to be of wider relevance, as this survey was one of the first national general population probability sample sexual behaviour surveys conducted in Central Europe, in a country with a low level HIV epidemic, and the first one to integrate a clinical measure of an STI.

Two immediate public health priorities have been identified based on the results presented in this thesis. Sexual and reproductive health and life skills education programmes that integrate HIV and STI related issues should be developed and a standard set of teaching tools designed to support its implementation in all primary schools at an early age, before a substantial proportion of young individuals become sexually active. Young people should be taught not only about the biomedical aspects of reproductive health but should also learn how to cope with the increasingly complex demands of relationships, based on the life-skills approach. In addition to issues relevant to preventing unwanted and delaying premature first heterosexual intercourse, prevention of unwanted conception and sexually transmitted infections, substance use issues

should also be included and relevant gender and developmental issues should be considered. The second public health priority is appointing an expert advisory group to prepare recommendations for a national strategy for prevention and control of *Chlamydia trachomatis* infection at the Ministry of Health. The group should collate available information on the prevalence of *Chlamydia trachomatis* infection in the population, consider cost-effectiveness of introducing screening for asymptomatic infections in Slovenia, identify needs for additional information needed to inform such a strategy and recommend how to obtain such information.

We hope that another national sexual behaviour survey will be conducted after a decade, to examine the changes that are likely to occur. To improve the quality of self reported data, increase respondents' willingness to report sensitive behaviours, the item response and internal data consistency, preparations for any future national sexual behaviour survey in Slovenia should, ideally, involve piloting the feasibility of CASI or audio-CASI in Slovenia and comparing it to pencil and paper self-administration of questionnaires. If cross-national comparisons were identified among the main objectives, serious attempts should be made to participate in developing and agreeing on internationally standardised methodology and to synchronise fieldwork timing.

In the mean time, possibilities to attach a shorter sexual behaviour module as well as testing for *Chlamydia trachomatis* infection to any large scale probability sample health related general population survey in Slovenia should be explored.

Targeted behavioural surveillance surveys should be conducted in groups at higher behavioural risk for HIV and STI, especially men who have sex with men and injecting drug users. This would enable trends to be monitored for a few key behavioural indicators, inform development of preventive interventions targeted to these groups at higher behavioural risk, and provide some information about behavioural links of these groups with the general population. Testing for biological markers should be integrated.

Possibilities for conducting a national *Chlamydia trachomatis* infection prevalence in a sample of general practices and gynaecologist outpatient services within primary health care should be explored. Also, efforts to improve the quality of *Chlamydia trachomatis* infection surveillance information based on universal mandatory reporting and setting up a national STI sentinel surveillance network in a convenience sample of general practices and gynaecologist outpatient services within primary health care should be continued.

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11. Additional tables

Table A.5.1. Time lag between age at first heterosexual experience and first intercourse for men and women

		First experience (1)		First intercourse (2)		Time lag between (1) and (2)			
		Median	Base	Median	Base	25th centile	Median	75th centile	Base
Men		15	877	17	877	1	2	3	849
	Birth cohort (age[a])								
	1950-1954 (45-49)	16	145	18	145	1	2	3	144
	1955-1959 (40-44)	15	136	18	136	1	2	4	136
	1960-1964 (35-39)	15	137	18	137	1	2	4	135
	1965-1969 (30-34)	15	131	17	131	1	2	3	131
	1970-1974 (25-29)	15	131	17	131	1	2	4	128
	1975-1979 (20-24)	15	138	17	138	1	2	3	128
	1980-1983 (18-19)	15	59	17	59	1	2	3	48
Women		16	854	18	861	0	1	3	833
	Birth cohort (age[a])								
	1950-1954 (45-49)	17	132	18	134	0	1	3	132
	1955-1959 (40-44)	16	143	18	143	0	2	3	143
	1960-1964 (35-39)	16	137	18	139	0	2	3	137
	1965-1969 (30-34)	16	128	18	128	0	2	3	128
	1970-1974 (25-29)	16	126	18	127	0	1	3	124
	1975-1979 (20-24)	16	128	17	130	0	1	2	119
	1980-1983 (18-19)	15	60	17	60	1	2	2	50

a – approximate age at interview

Methods for complex survey data (svy commands) in STATA were used to obtain weighted estimates.
Records of individuals who reported not to have had first heterosexual experience and / or intercourse yet were included in analysis (coded 96), as eventually almost everyone experiences both. All individuals who refused to report either the age at first heterosexual experience or intercourse were excluded from relevant analyses. Four individuals who reported the first intercourse at a younger age than first heterosexual experience were excluded from analyses.

Table A. 5.2. Cumulative proportions of men and women who experienced first heterosexual intercourse (FHI) by certain age according to birth cohort (estimates assuming no bias and those assuming maximum bias are shown)

	Men								Women							
	1950-1964 (35-49) (%)		1965-1974 (25-34) (%)		1975-1982 (18-24) (%)		All cohorts (%)		1950-1964 (35-49) (%)		1965-1974 (25-34) (%)		1975-1982 (18-24) (%)		All cohorts (%)	
	No bias assumed	Max bias	No bias assumed	Max bias	No bias assumed	Max bias	No bias assumed	Max bias	No bias assumed	Max bias	No bias assumed	Max bias	No bias assumed	Max bias	No bias assumed	Max bias
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	0.6	0.6	0.5	0.5	0.9	0.9	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	2.7	2.7	4.3	4.3	2.5	2.5	3.1	3.1	0.7	0.7	0.0	0.0	1.4	1.4	0.6	0.6
14	7.3	7.3	6.8	6.8	6.6	6.6	7.0	7.0	1.6	1.6	1.3	1.3	4.6	4.6	2.2	2.2
15	13.7	13.7	16.2	16.2	17.1	17.1	15.2	15.2	5.2	5.2	5.7	5.7	14.4	14.4	7.4	7.4
16	25.7	25.7	31.5	31.5	35.1	35.1	29.5	29.5	13.2	13.2	17.7	17.7	34.4	34.4	19.2	19.2
17	47.3	47.3	54.2	54.2	53.4	53.4	50.7	50.7	35.6	35.6	45.3	45.3	52.4	52.4	42.2	42.2
18	65.9	65.9	73.0	73.0	71.3	75.1	69.2	70.1	59.7	59.7	65.8	65.8	72.0	73.5	64.2	64.5
19	75.7	75.7	79.2	79.2	79.9	85.1	77.7	78.8	78.6	78.6	78.6	78.6	78.3	84.0	78.6	79.8
20	87.6	87.6	88.0	88.0	84.9	92.8	87.3	88.9	84.8	84.8	90.9	90.9	84.7	91.8	86.7	88.1
21	90.6	90.6	90.4	90.4	86.8	96.1	90.0	91.8	92.1	92.1	93.8	93.8	88.3	96.4	92.2	93.6
22	93.0	93.0	91.8	91.8	91.3	98.2	92.2	93.8	95.2	95.2	95.7	95.7	89.2	98.5	94.7	96.1
23	95.3	95.3	94.2	94.2	91.3	99.5	94.5	95.9	96.7	96.7	96.1	96.1	91.4	99.4	96.0	97.1
24	96.1	96.1	94.8	94.8	91.3	100	95.3	96.6	98.3	98.3	97.6	97.6	91.4	100	97.6	98.4
25	97.6	97.6	95.8	96.2			96.7	97.7	99.1	99.1	97.6	97.6			98.2	98.8
26	97.8	97.8	95.8	96.6			96.8	98.0	99.1	99.1	99.0	99.0			98.9	99.3
27	97.8	97.8	96.3	97.5			97.1	98.2	99.1	99.1	99.0	99.5			98.9	99.4
28	98.3	98.3	97.1	98.5			97.7	98.7	99.4	99.4	99.0	100			99.2	99.7
29	98.8	98.8	97.9	99.4			98.4	99.3	99.4	99.4	99.0	100			99.2	99.7
30	98.8	98.8	97.9	100			98.4	99.4	99.8	99.8	99.0	100			99.7	99.9
31	98.8	99.1	97.9	100			98.4	99.4	99.8	99.8	99.0	100			99.7	99.9
32	98.8	99.1	97.9	100			98.4	99.4	99.8	99.8	99.0	100			99.7	99.9
33	98.8	99.1	97.9	100			98.4	99.4	99.8	99.8	99.0	100			99.7	99.9
34	98.8	99.1	97.9	100			98.4	98.4	99.8	99.8	99.0	100			99.7	99.9
35	99.1	99.1					98.8	99.6	99.8	99.8					99.7	99.9
36	99.1	99.1					98.8	99.6	99.8	99.8					99.7	99.9
37	99.1	99.1					98.8	99.6	99.8	99.8					99.7	99.9
38	99.1	99.5					98.8	99.7	99.8	99.8					99.7	99.9
39	99.1	99.5					98.8	99.7	99.8	100					99.7	100
40	99.1	99.5					98.8	99.7	99.8	100					99.7	100
41	99.1	99.5					98.8	99.7	99.8	100					99.7	100
42	99.1	99.5					98.8	99.7	99.8	100					99.7	100
43	99.1	99.5					98.8	99.7	99.8	100					99.7	100
44	99.1	99.7					98.8	99.9	99.8	100					99.7	100
45	99.1	99.7					98.8	99.9	99.8	100					99.7	100
46	99.1	99.7					98.8	99.9	99.8	100					99.7	100
47	99.1	99.7					98.8	99.9	99.8	100					99.7	100
48	99.1	99.7					98.8	99.9	99.8	100					99.7	100
49	99.1	100					98.8	100	99.8	100					99.7	100
Base	417		262		198		877		416		255		190		861	

Estimates were obtained by Kaplan Meier survival analysis. This involves the assumption that the distribution of age at FHI for those not having experienced FHI by the time of the survey (censored) will be the same as for those who were older at the time of the survey and had already experienced FHI. Maximum bias would occur if all individuals who have not had FHI yet at the time of the survey, would have it at the age at which they were surveyed.

Log rank test results (p values) – comparing whole length Kaplan Mayer failure curves estimated assuming no bias (p values) and assuming maximum possible bias ($p_{m.b}$ values) and comparing the curves truncated before the age 17 years (bias not possible)

	Whole curves		Curves truncated before the age 17	
	p	$p_{m.b.}$	p	$p_{m.b.}$
Comparing men and women	0.17	0.18	<0.01	-
Comparing three birth cohorts of men	0.68	<0.01	0.54	-
Comparing three birth cohorts of women	0.08	<0.01	<0.01	-
Comparing men and women born during 1950-1964	0.28	0.29	<0.01	-
Comparing men and women born during 1965-1974	0.43	0.47	<0.01	-
Comparing men and women born during 1975-1982	0.78	0.65	0.34	-

Table A 5.3. Association of early first heterosexual intercourse (before age of 16) with birth cohort, education, religious affiliation, community size, family structure until adolescence, and main source of information about sex matters for men and women (univariate analysis)

	Men				Women			
	FHI[a] <16 years old	Base	OR[b]	p value (95% CI[c])	FHI[a] <16 years old	Base	OR[b]	p value (95% CI[c])
Birth cohort (age[d])								
1950-1954 (45-49)	15.8	45	1	p=0.24	5.2	134	1	p<0.01
1955-1959 (40-44)	11.8	36	0.7	(0.3 - 1.5)	6.2	143	1.2	(0.4 – 3.9)
1960-1964 (35-39)	13.4	37	0.8	(0.4 - 1.9)	4.1	139	0.8	(0.2 – 2.9)
1965-1969 (30-34)	12.6	31	0.8	(0.3 – 1.7)	1.8	128	0.3	(0.1 – 1.8)
1970-1974 (25-29)	19.8	31	1.3	(0.6 – 2.8)	9.6	127	2.0	(0.6 – 6.1)
1975-1979 (20-24)	14.7	38	0.9	(0.5 – 1.8)	14.1	130	3.0	(1.1 – 8.0)
1980-1982 (18-19)	22.8	59	1.6	(0.8 – 3.2)	15.0	60	3.2	(1.1 – 9.9)
Education								
<1st stage secondary	19.4	113	1	p=0.36	15.5	159	1	p<0.01
1st or 2nd stage secondary	15.1	638	0.7	(0.4 – 1.3)	5.6	524	0.3	(0.2 – 0.6)
Recognised 3rd level	12.3	122	0.6	(0.3 – 1.3)	5.4	176	0.3	(0.1 – 0.8)
Religious affiliation								
Roman Catholic	12.6	580	1	p<0.01	6.7	577	1	p=0.39
Other religious affiliation	30.7	43	3.1	(1.6 – 6.1)	4.9	42	0.7	(0.2 – 3.0)
None	18.6	250	1.6	(1.0 – 2.5)	9.0	260	1.4	(0.8 – 2.3)
Community size								
<100,000	14.5	734	1	p=0.23	6.3	696	1	p=0.02
>100,000	18.7	143	1.4	(0.8 – 2.2)	12.0	165	2.0	(1.1 – 3.7)
Living with both parents until age 15								
Yes	13.2	723	1	p<0.01	6.7	723	1	p=0.12
No	24.5	154	2.1	(1.3 – 3.5)	10.8	138	1.7	(0.9 – 3.2)
Main source of information about sex								
First partners	19.6	201	1	p=0.25	13.2	104	1	p<0.01
Friends, siblings	17.0	231	0.8	(0.5 – 1.4)	9.5	196	0.7	(0.3 – 1.4)
Other	13.7	219	0.7	(0.4 – 1.1)	7.7	214	0.5	(0.2 – 1.2)
Parents	11.0	109	0.5	(0.2 – 1.2)	4.0	261	0.3	(0.1 – 0.6)
School	11.4	107	0.5	(0.3 – 1.1)	4.0	77	0.3	(0.1 – 0.8)

a – first heterosexual intercourse
b - odds ratio
c - confidence interval
d – approximate age at interview

Methods for complex survey data (svy commands) in STATA were used to obtain weighted estimates. Logistic regression for survey data was used to compute pseudo-maximum likelihood estimates of odds ratios together with 95% CI and results of adjusted Wald tests for significance.
All individuals who refused to report the age at first heterosexual and four individuals who reported FHI at a younger age than first heterosexual experience were excluded from analysis. Numbers of individuals (bases) included into analyses vary according to the number of missing values for individual variables.

Table A 5.4. Association of very early first heterosexual intercourse (before age of 15) with birth cohort, education, religious affiliation, community size, family structure until adolescence, and main source of information about sex matters for men and women (univariate analysis)

	Men				Women			
	FHI[a] <15 years old	Base	OR[b]	p value (95% CI[c])	FHI[a] <15 years old	Base	OR[b]	p value (95% CI[c])
Birth cohort (age[d])								
1950-1954 (45-49)	9.0	145	1	p=0.86	1.9	134	1	p=0.28
1955-1959 (40-44)	4.1	136	0.4	(0.1 - 1.3)	1.9	143	1.0	(0.1 – 7.3)
1960-1964 (35-39)	8.5	137	0.9	(0.4 – 2.5)	0.9	139	0.5	(0.0 – 5.1)
1965-1969 (30-34)	5.7	131	0.6	(0.2 – 1.8)	0.0	128	-	
1970-1974 (25-29)	7.9	131	0.9	(0.3 – 2.4)	2.5	127	1.3	(0.2 – 8.5)
1975-1979 (20-24)	6.7	138	0.7	(0.3 – 1.8)	3.6	130	1.9	(0.4– 10.2)
1980-1982 (18-19)	6.4	159	0.7	(0.2 – 2.0)	6.8	60	3.8	(0.7– 20.0)
Education								
<1st stage secondary	9.2	113	1	p=0.67	6.1	159	1	p<0.01
1st or 2nd stage secondary	6.6	638	0.7	(0.3 – 1.5)	0.8	524	0.1	(0.0 – 0.4)
Recognised 3rd level	7.3	122	0.8	(0.3 – 2.3)	2.6	176	0.4	(0.1 – 1.4)
Religious affiliation								
Roman Catholic	5.6	580	1	p=0.05	1.5	577	1	p=0.17
Other religious affiliation	16.0	43	3.2	(1.1 – 9.0)	2.8	42	1.9	(0.2 –15.5)
None	8.9	250	1.6	(0.8 – 3.3)	3.5	260	2.4	(1.0 – 6.3)
Community size								
<100,000	6.5	734	1	p=0.26	1.5	696	1	p<0.01
>100,000	9.6	143	1.5	(0.7 – 3.2)	4.9	165	3.4	(1.4 – 8.4)
Living with both parents until age 15								
Yes	5.6	723	1	p<0.01	1.5	723	1	p<0.01
No	13.5	154	2.6	(1.4 – 4.9)	5.7	138	4.0	(1.6 –10.4)
Main source of information about sex								
First partners	7.5	201	1	p=0.23	5.0	104	1	p=0.15
Friends, siblings	9.7	231	1.3	(0.6 – 3.0)	2.8	196	0.5	(0.2 – 1.6)
Other	5.7	219	0.8	(0.3 – 1.6)	2.7	214	0.5	(0.2 – 1.7)
Parents	6.8	109	0.9	(0.3 – 3.3)	0.8	261	0.1	(0.0 – 0.8)
School	3.5	107	0.5	(0.1 – 1.6)	0.0	77	-	

a – first heterosexual intercourse
b - odds ratio
c - confidence interval
d – approximate age at interview

Methods for complex survey data (svy commands) in STATA were used to obtain weighted estimates. Logistic regression for survey data was used to compute pseudo-maximum likelihood estimates of odds ratios together with 95% CI and results of adjusted Wald tests for significance.
All individuals who refused to report the age at first heterosexual and four individuals who reported FHI at a younger age than first heterosexual experience were excluded from analysis. Numbers of individuals (bases) included into analyses vary according to the number of missing values for individual variables.

Table A 5.5. Contextual factors for first heterosexual intercourse for men and women according to birth cohort (approximate age at interview)

	Men					Women				
	1950-1964 35-49 %	1965-1974 25-34 %	1975-1982 18-24 %	p[a]	All %	1950-1964 35-49 %	1965-1974 25-34 %	1975-1982 18-24 %	p[a]	All %
Relationship										
Paid (men only)	0.8	1.1	0.4	0.68	0.8	-	-	-		-
Just met	9.6	11.3	6.8	0.30	9.5	3.6	2.3	5.1	0.32	3.5
Met recently	14.6	23.3	18.0	0.03	17.9	9.1	13.4	9.4	0.15	10.5
Knew, but not steady	55.9	48.0	51.7	0.16	52.6	47.7	54.0	43.5	0.08	48.8
Steady relationship	14.6	14.9	21.6	0.13	16.1	32.2	26.1	40.2	0.01	31.9
Engaged	2.2	0.5	0.0	0.11	1.2	3.3	1.4	0.4	0.04	2.2
Married	0.0	0.0	0.0	-	0.0	2.1	1.4	0.0	0.27	1.5
Other	2.4	1.1	1.6	0.49	1.8	2.2	1.4	1.5	0.68	1.9
Base	408	252	166		825	411	249	157		818
Main triggering factor										
Curiosity	31.3	41.3	35.2	0.06	35.2	10.1	16.6	19.0	<0.01	13.8
Peer group pressure	1.7	0.0	3.4	0.02	1.5	2.4	2.0	1.7	0.82	2.2
To lose virginity	3.6	4.6	6.1	0.43	4.4	0.6	1.4	1.1	0.54	1.0
Drunk	1.7	2.3	2.1	0.83	2.0	0.6	0.9	2.4	0.18	1.0
Carried away	14.1	8.9	9.8	0.11	11.6	8.0	7.2	5.3	0.53	7.2
Natural course of relationship	14.6	14.7	14.3	0.99	14.6	20.5	21.9	19.8	0.84	20.8
In love	32.7	27.7	28.1	0.33	30.3	54.5	48.6	50.7	0.32	51.9
Married	0.0	0.0	0.0	-	0.0	2.1	1.5	0.0	0.27	1.5
Other	0.3	0.5	1.2	0.44	0.5	1.2	0.0	0.0	0.08	0.6
Base	398	251	163		812	406	246	155		807
Planning										
Just happened	49.9	49.7	44.8	0.55	48.4	35.4	36.4	31.5	0.43	35.0
Expected	34.8	38.3	34.0	0.59	35.8	38.2	39.0	44.8	0.34	39.7
Planned	15.3	11.9	21.2	0.06	15.4	26.4	24.6	32.7	0.74	25.3
Base	385	243	159		786	389	239	154		782
Wished										
Yes, wished	99.2	99.5	98.8	0.76	99.2	80.4	84.2	89.5	0.03	83.3
No, persuaded	0.8	0.5	1.2	0.76	0.8	18.5	15.4	9.3	0.03	15.8
No, forced	0.0	0.0	0.0	-	0.0	1.1	0.5	1.1	0.59	0.9
Base	389	239	161		789	396	238	156		790
Feelings after										
Too soon	7.8	9.9	12.3	0.25	9.3	27.8	25.9	28.2	0.82	27.3
Waited too long	7.2	5.5	4.7	0.45	6.2	3.7	3.1	2.9	0.83	3.4
About right	79.8	81.5	77.7	0.64	79.9	65.7	65.7	66.1	0.99	65.8
Could not say	5.2	3.1	5.4	0.34	4.6	2.8	5.3	2.8	0.18	3.6
Base	409	252	167		828	417	254	158		828

a – p value – results of tests for heterogeneity of proportions of particular categories according to birth cohort

Methods for complex survey data (svy commands) in STATA were used to obtain weighted estimates. Numbers of individuals (base) included into analyses vary according to the number of missing values for individual variables.

Table A 5.6. Contextual factors for first heterosexual intercourse for men and women according to age at the event

	Men					Women				
	<16 %	16-17 %	18+ %	p[a]	All %	<16 %	16-17 %	18+ %	p[a]	All %
Relationship										
Paid (men only)	0.8	0.4	1.1	0.63	0.8	-	-	-		-
Just met	8.3	9.9	9.7	0.89	9.5	5.1	2.7	3.8	0.54	3.5
Met recently	16.2	20.2	16.5	0.40	17.8	15.3	14.0	7.5	*0.01*	10.5
Knew, but not steady	59.0	54.1	49.4	*0.08*	52.7	51.8	49.5	47.6	0.76	48.6
Steady relationship	12.2	13.2	19.8	*0.03*	16.1	19.2	31.3	34.2	*0.03*	32.0
Engaged	0.0	0.0	2.7	0.01	1.2	0.0	0.9	3.3	*0.02*	2.2
Married	0.0	0.0	0.0	-	0.0	1.8	0.4	2.1	0.19	1.5
Other	3.5	2.2	0.9	0.20	1.8	6.8	1.2	1.6	0.01	1.9
Base	134	308	383		824	62	298	456		815
Main triggering factor										
Curiosity	42.6	39.1	29.1	*<0.01*	35.1	20.3	15.9	11.6	*0.01*	13.8
Peer group pressure	1.1	1.9	1.3	0.78	1.5	4.8	1.3	2.4	0.28	2.2
To lose virginity	2.9	6.3	3.4	0.12	4.4	0.0	1.1	1.0	0.71	1.0
Drunk	1.8	2.4	1.6	0.79	2.0	1.1	1.6	0.7	0.47	1.1
Carried away	11.4	11.5	11.9	0.98	11.6	5.2	9.3	5.9	0.21	7.1
Natural course of relationship	11.4	11.5	18.2	*0.03*	14.6	9.1	15.9	25.8	*<0.01*	20.9
In love	28.8	26.5	33.9	0.16	30.3	55.6	54.4	49.7	*0.19*	51.9
Married	0.0	0.0	0.0	-	0.0	1.9	0.4	2.2	0.19	1.5
Other	0.0	0.8	0.5	0.51	0.5	2.0	0.0	0.8	0.19	0.6
Base	134	303	373		810	60	296	448		804
Planning										
Just happened	56.9	51.1	43.9	0.06	48.7	40.1	33.6	35.0	0.73	34.8
Expected	29.2	36.0	38.0	0.24	35.8	40.8	44.7	36.2	0.08	39.8
Planned	13.8	12.9	18.1	0.19	15.5	19.1	21.7	28.8	0.05	25.4
Base	129	293	363		785	58	292	429		779
Wished										
Yes	98.9	99.2	99.4	0.89	99.2	78.1	78.6	87.2	<0.01	83.4
No, persuaded	1.1	0.8	0.7	0.89	0.8	17.7	21.0	11.9	<0.01	15.7
No, forced	0.0	0.0	0.0	-	0.0	4.2	0.3	0.9	0.06	0.9
Bases	131	294	365		789	59	289	439		787
Feelings after										
Too soon	16.3	11.1	5.6	*<0.01*	9.4	49.9	37.2	17.9	*<0.01*	27.3
Waited too long	5.4	4.4	7.9	0.23	6.2	2.0	2.0	4.5	0.13	3.4
About right	72.5	79.9	82.3	*0.05*	79.9	41.1	57.3	74.5	*<0.01*	65.8
Could not say	5.9	4.6	4.2	0.76	4.6	7.0	3.6	3.2	0.36	3.6
Base	131	310	386		827	62	298	466		825

a – p value – results of the tests for heterogeneity of proportions or tests for trend in proportions (in italic) for particular categories according to birth cohort

Methods for complex survey data (svy commands) in STATA were used to obtain weighted estimates. Whenever appropriate (gradually increasing or declining proportions), tests for trend were computed by fitting logistic regression models with age at first heterosexual intercourse (in given categories) fitted linearly.

Four individuals who reported the first heterosexual intercourse at a younger age than first heterosexual experience were excluded from analyses. Numbers of individuals (base) included into analyses vary according to the number of missing values for individual variables.

Table A 5.7. Association of non-use of contraception at first heterosexual intercourse (FHI) with birth cohort, FHI period, early FHI, first partner type, planning and being in control at the event, family structure until adolescence, receiving information about sex matters in school, education, religious affiliation, and community size for men and women (univariate analysis)

	Men				Women			
	No contra-ception %	Base	OR[a]	p value (95% CI[b])	No contra-ception %	Base	OR[a]	p value (95% CI[b])
Birth cohort (age[c])								
1950-1954 (45-49)	41.4	137	1	p_t[f]<0.01	50.8	131	1	p_t[f]<0.01
1955-1959 (40-44)	33.1	131	0.7	(0.4-1.3)	46.7	142	0.9	(0.5-1.5)
1960-1964 (35-39)	39.3	129	0.9	(0.5-1.7)	31.5	138	0.5	(0.2-0.8)
1965-1969 (30-34)	35.5	125	0.8	(0.4-1.5)	34.5	126	0.5	(0.3-1.0)
1970-1974 (25-29)	31.3	124	0.6	(0.4-1.2)	25.7	125	0.3	(0.2-0.6)
1975-1979 (20-24)	21.3	121	0.4	(0.2-0.7)	18.7	113	0.2	(0.1-0.4)
1980-1982 (18-20)	8.6	46	0.1	(0.1-0.3)	13.4	46	0.2	(0.1-0.3)
FHI[d] period (AIDS awareness[e])								
<1986 (none/very low)	39.2	478	1	p_t[f]<0.01	41.9	475	1	p_t[f]<0.01
1986-1989 (low)	26.5	106	0.6	(0.3-0.9)	24.6	115	0.5	(0.3-0.8)
1990-1994 (medium)	26.3	118	0.6	(0.4-0.9)	28.2	132	0.5	(0.4-0.8)
1995-1999 (high)	15.8	109	0.3	(0.2-0.5)	14.0	96	0.2	(0.1-0.4)
Age at FHI[d]								
16 + years old	30.9	681	1	p=0.05	33.4	757	1	p=0.18
<16 years old	40.9	131	1.6	(1.0-2.4)	41.5	62	1.4	(0.8-2.4)
Relationship with first partner								
Not steady	34.0	662	1	p=0.07	35.3	510	1	p=0.15
Steady	25.2	144	0.7	(0.4-1.0)	30.5	296	0.8	(0.6-1.1)
Planning								
Not planned	34.3	646	1	p=0.05	33.1	577	1	p=1.00
Planned	25.1	121	0.6	(0.4-1.0)	33.1	197	1.0	(0.7-1.4)
In control at FHI[d]								
Yes	30.8	690	1	p=0.01	33.7	732	1	p=0.94
No (carried away, drunk)	44.3	104	1.8	(1.1-2.8)	34.1	66	1.0	(0.6-1.7)
Living with both parents until age 15								
Yes	32.9	666	1	p=0.61	34.5	691	1	p=0.52
No	30.3	147	0.9	(0.6-1.4)	31.4	131	0.9	(0.6-1.3)
Information about sex in school								
Not received	34.6	443	1	p=0.20	38.0	368	1	p=0.05
Received	29.9	370	0.8	(0.6-1.1)	30.8	453	0.7	(0.5-1.0)
Education								
<1st stage secondary	33.4	100	1	p=0.56	45.7	148	1	p<0.01
1st or 2nd stage secondary	33.0	594	1.0	(0.6-1.7)	34.6	499	0.6	(0.4-0.9)
Recognised 3rd level	27.5	117	0.8	(0.4-1.4)	22.8	171	0.4	(0.2-0.6)
Religious affiliation								
Roman Catholic	32.9	534	1	p=0.44	36.0	531	1	p=0.03
None	29.8	236	0.9	(0.6-1.2)	27.4	248	0.7	(0.5-1.0)
Community size								
<100,000	31.5	679	1	p=0.23	35.4	664	1	p=0.14
>100,000	37.2	134	1.3	(0.9-2.0)	28.2	157	0.7	(0.5-1.1)

a - odds ratio
b - confidence interval
c – approximate age at interview
d - first heterosexual intercourse
e - AIDS awareness was estimated as length of period of exposure to news about AIDS and condom use promotion campaigns before the year in which FHI occurred. The first mass media AIDS awareness campaign in Slovenia was implemented in 1986.
f – p value for test for trend

Methods for complex survey data (svy commands) in STATA were used to obtain weighted estimates. Tests for trend were based on inclusion of linear term for birth cohort or period at FHI in the logistic regression model.
All individuals who refused to report the age at first heterosexual intercourse were excluded from analysis. Numbers of individuals (bases) included into analyses vary according to the number of missing values for individual variables. Four individuals who reported FHI at a younger age than first heterosexual experience were excluded from analysis of effects of FHI period and age at FHI. Two individuals with FHI in the year 2000 were excluded from analysis of FHI period effect. Individuals with "other" than Roman Catholic religious affiliation were excluded from analysis of religious affiliation effect.

Table A 5.8. Contraceptive methods at first heterosexual intercourse for men and women according to birth cohort (age at interview) and period during which it occurred

	Birth cohort (age[a])				FHI[b] period				
	1950-1964 (36-49) % (95% CI)	1965-1974 (26-35) % (95% CI)	1975-1982 (18-25) % (95% CI)	p_t[c]	<1980 % (95% CI)	1980-1981 % (95% CI)	1990-1999 % (95% CI)	p_t[c]	All % (95% CI)
Men				<0.01				<0.01	
Contraception used	60.0 54.3-65.5	65.6 58.3-72.2	81.9 76.9-86.1	0.00	60.6 54.3-66.5	62.1 55.2-68.7	78.7 73.3-83.3	0.00	66.1 62.4-69.7
Pill only	7.7 (5.2-11.3)	9.3 (5.9-14.4)	5.0 (2.9-8.3)	0.34	7.7 (5.0-11.8)	8.7 (5.4-13.5)	6.4 (4.0-10.1)	0.55	7.6 (5.8-10.1)
Pill & condom	0.4 (0.0-2.5)	1.7 (0.5-5.2)	3.7 (2.0-6.8)	<0.01	0.4 (0.0-3.1)	1.1 (0.3-4.5)	3.3 (1.8-5.9)	0.03	1.4 (0.8-2.5)
Condom only	7.5 (4.9-11.2)	22.6 (17.0-29.4)	57.4 (51.3-63.2)	<0.01	4.8 (2.8-8.3)	16.9 (12.5-22.6)	53.6 (47.5-59.5)	<0.01	22.2 (19.3-25.3)
Other methods	2.5 (1.2-4.8)	3.3 (1.5-7.1)	0.0	0.09	2.3 (1.0-5.0)	4.0 (2.0-7.9)	0.0	0.04	2.2 (1.3-3.7)
Withdrawal	37.1 (32.2-42.2)	25.7 (19.5-33.1)	14.1 (10.2-19.1)	<0.01	40.7 (35.3-46.4)	26.8 (21.0-33.5)	14.1 (10.3-19.1)	<0.01	29.0 (25.6-32.5)
Safe period	5.0 (3.1-7.9)	3.0 (1.2-7.0)	1.8 (0.8-4.4)	0.05	4.6 (2.6-7.9)	4.7 (2.4-8.7)	1.4 (0.6-3.2)	0.03	3.7 (2.5-5.4)
No contraception	36.8 (31.4-42.4)	32.9 (26.3-40.1)	17.7 (13.6-22.8)	<0.01	36.0 (30.3-42.0)	35.6 (29.2-42.6)	21.3 (16.7-26.7)	<0.01	31.7 (28.2-35.5)
Do not remember	3.2 (1.7-6.1)	1.6 (0.5-4.8)	0.4 (0.0-2.5)	0.03	3.5 (1.7-6.9)	2.3 (0.9-5.6)	0.0	<0.01	2.1 (1.2-3.7)
Base (100%)	411	253	167		332	270	227		831
Women									
Contraception used	56.6 51.1-61.9	69.2 62.2-75.5	82.5 77.4-86.6	0.00	52.3 45.9-58.6	70.3 63.5-76.4	77.6 71.9-82.4	0.00	65.5 61.7-69.0
Pill only	5.2 (3.1-8.4)	5.9 (3.3-10.2)	4.6 (2.6-8.0)	0.88	3.6 (1.8-7.3)	7.8 (4.9-12.2)	3.7 (2.1-6.4)	0.79	5.3 (3.8-7.3)
Pill & condom	0.0	0.9 (0.2-3.5)	3.1 (1.6-5.8)	<0.01	0.0	0.0	3.1 (1.7-5.7)	-	0.9 (0.5-1.6)
Condom only	6.3 (4.2-9.3)	24.0 (18.0-29.3)	56.0 (46.6-59.1)	<0.01	5.3 (3.1-8.9)	15.4 (11.5-20.3)	47.6 (41.3-54.0)	<0.01	20.4 (17.8-23.3)
Other methods	2.9 (1.6-5.2)	4.4 (2.2-8.9)	0.4 (0.2-3.5)	0.18	2.5 (1.2-5.1)	4.7 (2.6-8.3)	1.3 (0.4-4.2)	0.49	2.9 (1.9-4.5)
Withdrawal	34.7 (29.6-40.2)	31.0 (24.8-37.9)	19.4 (14.7-25.2)	<0.01	33.3 (27.6-39.6)	37.2 (31.0-43.7)	19.3 (14.9-24.6)	<0.01	30.6 (27.2-34.3)
Safe period	7.5 (5.1-10.9)	4.0 (1.9-8.2)	2.2 (1.0-4.8)	<0.01	7.5 (4.8-11.7)	5.4 (3.2-9.0)	2.6 (1.2-5.3)	0.02	5.4 (3.9-7.4)
No contraception	42.5 (37.2-48.1)	29.8 (23.6-36.8)	17.1 (13.0-22.1)	<0.01	46.9 (40.6-53.4)	28.4 (22.4-35.2)	22.1 (17.3-27.9)	<0.01	33.7 (30.1-37.5)
Do not remember	0.9 (0.3-2.8)	1.0 (2.3-3.8)	0.4 (0.0-3.1)	0.61	0.8 (0.2-3.2)	1.3 (0.4-3.9)	0.3 (0.0-2.2)	0.52	0.8 (0.3-2.0)
Base (100%)	415	254	160		313	283	229		828

a – approximate age at interview
b – first heterosexual intercourse
c - p value for test for trend

Methods for complex survey data (svy commands) in STATA were used to obtain weighted estimates and 95% confidence. Tests for trend were based on inclusion of linear term for age at FHI in the logistic regression model.
Four individuals who reported the first heterosexual intercourse (FHI) at a younger age than first heterosexual experience and two individuals who experienced FHI in the year 2000 were excluded from stratified analyses according to the period during which FHI occurred.

Table A 5.9. Contraceptive methods at first heterosexual intercourse for men and women according to age at the event

	Age at FHI[b]				Age at FHI[b]		
	<16 % (95% CI[c])	16-17 % (95% CI[c])	18+ % (95% CI[c])	p p_t	16+ % (95% CI[c])	p	All % (95% CI[c])
Men							
Contraception used	58.0 48.3-67.1	65.3 59.2-71.0	69.5 64.2-74.3	0.08 0.03	88.6 85.7-90.9	0.05	66.1 62.4-69.7
Pill only	7.3 3.7-13.9	7.1 4.4-11.5	8.2 5.7-11.7	0.89 0.71	7.7 5.7-10.3	0.87	7.7 5.8-10.1
Pill & condom	0.8 0.2.3.1	1.6 0.6-4.1	1.5 0.7-3.4	0.72 0.55	1.6 0.8-2.9	0.36	1.4 0.8-2.5
Condom only	15.9 10.9-22.6	18.8 15.0-23.3	27.1 22.6-32.1	0.00 0.00	23.4 20.2-26.9	0.05	22.2 19.3-25.3
Other methods	3.5 1.2-10.2	1.7 6.6-4.5	2.2 1.1-4.4	0.61 0.61	2.0 1.1-3.5	0.36	2.2 1.3-3.7
Withdrawal	28.5 21.0-37.6	23.3 27.0-38.2	26.2 21.8-31.3	0.24 0.31	28.9 25.5-32.6	0.91	28.8 25.6-32.4
Safe period	2.0 0.6-6.2	3.7 2.0-6.8	4.3 2.5-7.4	0.50 0.26	4.1 2.7-6.0	0.23	3.7 2.5-5.4
No contraception	40.2 31.2-49.9	32.2 26.7-38.3	28.5 23.8-33.8	0.08 0.03	30.2 26.4-34.2	0.05	31.8 28.3-35.5
Do not remember	1.8 3.8-8.4	2.4 1.0-5.7	2.0 0.9-4.4	0.93 0.97	2.2 1.2-3.9	0.84	2.1 1.2-3.7
Base (100%)	134	309	387		696		829
Women							
Contraception used	58.5 46.2-69.8	70.0 64.0-75.3	63.5 58.6-68.1	0.08 0.58	66.0 62.2-69.7	0.18	65.5 61.7-69.0
Pill only	1.8 0.2-11.4	6.0 3.9-9.4	4.9 3.0-7.8	0.39 0.76	5.3 3.8-7.4	0.23	5.1 3.6-7.0
Pill & condom	0.7 0.0-4.6	1.0 0.4-2.3	0.8 0.3-2.1	0.93 0.99	0.9 0.5-1.7	0.77	0.9 0.5-1.6
Condom only	24.0 15.5-35.2	20.9 16.9-25.5	19.8 16.3-23.8	0.72 0.44	20.2 17.6-23.2	0.47	20.5 17.9-23.4
Other methods	0.0	3.3 1.8-6.2	3.0 1.6-5.5	0.42 0.42	3.1 2.0-4.9	0.19	2.9 1.9-4.5
Withdrawal	32.1 21.8-44.5	33.6 28.3-39.2	28.7 24.2-33.7	0.35 0.22	30.6 27.0-34.4	0.84	30.7 27.2-34.4
Safe period	0.0	5.2 3.1-8.5	6.3 4.2-9.2	0.13 0.05	5.8 4.3-8.0	0.05	5.4 3.9-7.4
No contraception	41.5 30.2-53.8	29.0 23.7-35.0	35.7 31.1-40.7	0.08 0.58	33.1 29.4-37.0	0.18	33.7 30.1-37.5
Do not remember	0.0	1.0 0.3-3.2	0.8 0.3-2.5	0.73 0.77	0.9 0.4-2.2	0.53	0.8 0.3-2.0
Base (100%)	62	230	464		763		825

a – approximate age at interview
b – first heterosexual intercourse
c – p value test for trend
Methods for complex survey data (svy commands) in STATA were used to obtain weighted estimates. Tests for trend were based on inclusion of linear term for age at FHI in the logistic regression model.
Four individuals who reported the first heterosexual intercourse (FHI) at a younger age than first heterosexual experience were excluded from analyses.

Table A 5.10. Association of condom use at first heterosexual intercourse (FHI) with birth cohort, FHI period, early FHI, first partner type, planning and being in control at the event, family structure until adolescence, receiving information about sex matters in school, education, religious affiliation, and community size for men and women (univariate analysis)

	Men				Women			
	Used condom %	Base	OR[a]	p value (95% CI[b])	Used condom %	Base	OR[a]	p value (95% CI[b])
Birth cohort (age[c])								
1950-1954 (45-49)	3.7	142	1	p_t[f]<0.01	5.6	134	1	p_t[f]<0.01
1955-1959 (40-44)	5.9	133	1.6	(0.4-6.2)	3.5	142	0.6	(0.2-2.4)
1960-1964 (35-39)	14.3	134	4.3	(1.3-14.0)	9.7	141	1.8	(0.6-5.2)
1965-1969 (30-34)	17.5	129	5.5	(1.7-17.5)	11.1	129	2.1	(0.7-6.2)
1970-1974 (25-29)	31.0	126	11.6	(3.8-35.7)	37.7	124	10.3	(4.0-26.4)
1975-1979 (20-24)	54.3	121	30.7	(10.7-88.0)	50.5	114	17.3	(7.0-42.9)
1980-1982 (18-20)	79.7	46	102	(30.7-338)	67.9	47	35.8	(12.8-100)
FHI[d] period (AIDS awareness[e])								
<1986 (none/very low)	7.5	493	1	p_t[f]<0.01	6.5	482	1	p_t[f]<0.01
1986-1989 (low)	26.7	109	4.5	(2.4-8.2)	25.3	115	4.9	(2.7-8.9)
1990-1994 (medium)	43.3	117	9.4	(5.5-16.0)	41.2	132	10.1	(6.1-16.8)
1995-1999 (high)	71.7	109	31.1	(18.4-52.7)	63.8	97	25.4	(14.9-43.2)
Age at FHI[d]								
16 + years old	25.0	696	1	p=0.03	21.1	763	1	p=0.54
<16 years old	16.7	133	0.6	(0.4-1.0)	24.1	63	1.2	(0.7-2.1)
Relationship with first partner								
Not steady	20.9	678	1	p<0.01	19.8	518	1	p=0.11
Steady	34.2	146	2.0	(1.3-3.0)	24.4	297	1.3	(0.9-1.8)
Planning FHI[e]								
Not planned	22.4	663	1	p=0.13	20.0	581	1	p=0.06
Planned	28.6	121	1.4	(0.9-2.1)	26.8	198	1.5	(1.0-2.2)
In control at FHI[e]								
Yes	25.3	700	1	p<0.01	22.1	737	1	p=0.29
No (carried away, drunk)	10.1	110	0.3	(0.2-0.6)	16.3	67	0.7	(0.3-1.4)
Living with both parents until age 15								
Yes	25.3	681	1	p=0.02	21.8	698	1	p=0.38
No	16.3	150	0.6	(0.4-0.9)	18.4	131	0.8	(0.5-1.3)
Information about sex in school								
Not received	17.3	458	1	p<0.01	18.0	371	1	p=0.05
Received	31.4	373	2.2	(1.5-3.1)	23.9	458	1.4	(1.0-2.1)
Education								
<1st stage secondary	20.0	102	1	p=0.38	14.7	153	1	p=0.08
1st or 2nd stage secondary	23.3	603	1.2	(0.7-2.0)	23.4	502	1.8	(1.1-3.0)
Recognised 3rd level	28.3	122	1.6	(0.8-3.0)	21.3	171	1.6	(0.9-2.8)
Religious affiliation								
Roman Catholic	22.6	542	1	p=0.11	22.6	537	1	P=0.36
None	27.8	243	1.3	(0.9-1.8)	19.7	250	0.8	(0.6-1.2)
Community size								
<100,000	24.3	692	1	p=0.35	22.1	670	1	p=0.26
>100,000	20.3	138	0.8	(0.5-1.3)	17.6	159	0.7	(0.5-1.2)

a - odds ratio
b - confidence interval
c – approximate age at interview
d - first heterosexual intercourse
e - AIDS awareness was estimated as length of period of exposure to news about AIDS and condom use promotion campaigns before the year in which FHI occurred. The first mass media AIDS awareness campaign in Slovenia was implemented in 1986.
f – p value for test for trend

Methods for complex survey data (svy commands) in STATA were used to obtain weighted estimates. Tests for trend were based on inclusion of linear term for birth cohort or period at FHI in the logistic regression model.
Numbers of individuals (bases) included into analyses vary according to the number of missing values for individual variables. Four individuals who reported FHI at a younger age than first heterosexual experience were excluded from analysis of effects of FHI period and age at FHI. Two individuals with FHI in the year 2000 were excluded from analysis of FHI period effect. Individuals with "other" than Roman Catholic religious affiliation were excluded from analysis of religious affiliation effect.

Table A 6.1. Distribution of reported numbers of heterosexual partners in the past year for men and women by marital status

		Married	Cohabi-tation	Separated divorced widowed	Single	All
Men	Numbers of partners[a]					
	0	0.3%	0.0%	22.8%	25.0%	10.2%
	1	87.1%	83.0%	28.6%	41.6%	68.1%
	2	9.0%	14.0%	10.1%	13.4%	11.3%
	3-4	3.3%	2.4%	29.0%	14.1%	7.8%
	5+	0.3%	0.7%	9.5%	5.9%	2.6%
	Mean[b]	1.2	1.2	2.1	1.7	1.4
	SD[c]	0.7	0.7	1.9	3.1	2.0
	Median	1	1	1	1	1
	99th percentile	4	3	5	10	8
	Base (100%)	396	104	14	324	840
Women	Numbers of partners[a]					
	0	1.1%	0.0%	34.6%	26.3%	8.6%
	1	97.4%	97.3%	54.9%	53.7%	84.8%
	2	1.1%	1.0%	10.5%	13.4%	4.5%
	3-4	0.5%	1.7%	0.0%	4.7%	1.7%
	5+	0.0%	0.0%	0.0%	1.9%	0.5%
	Mean[b]	1.0	1.1	0.8	1.1	1.0
	SD[c]	0.2	0.4	0.6	1.0	0.6
	Median	1	1	1	1	1
	99th percentile	2	4	2	5	3
	Base (100%)	506	102	34	212	855

a - heterosexual partners only
b - mean is not the most appropriate summary measure as the distribution is skewed
c - standard deviation

Methods for complex survey data (svy commands) in STATA were used to obtain weighted estimates.

Table A 6.2. Distribution of reported numbers of heterosexual partners in the past year for men and women by current partnership status

		Married cohabi - tation	Steady partner	No partner currently	All
Men	Numbers of partners[a]				
	0	0.2%	1.4%	37.2%	10.2%
	1	85.9%	69.4%	23.7%	68.1%
	2	10.2%	11.8%	15.4%	11.3%
	3-4	3.4%	11.0%	17.4%	7.8%
	5+	0.3%	6.4%	6.3%	2.6%
	Mean[b]	1.2	1.8	1.8	1.4
	SD[c]	0.7	0.8	3.8	2.0
	Median	1	1	1	1
	99th percentile	4	11	8	8
	Base (100%)	496	139	184	840
Women	Numbers of partners[a]				
	0	0.7%	0.4%	52.5%	8.6%
	1	97.6%	80.4%	26.7%	84.8%
	2	1.1%	14.5%	13.2%	4.5%
	3-4	0.7%	3.3%	5.5%	1.7%
	5+	0.0%	1.5%	2.1%	0.5%
	Mean[b]	1.0	1.3	0.8	1.0
	SD[c]	0.2	0.7	1.2	0.6
	Median	1	1	0	1
	99th percentile	2	5	6	3
	Base (100%)	605	127	104	855

a - heterosexual partners only
b - mean is not the most appropriate summary measure as the distribution is skewed
c - standard deviation

Methods for complex survey data (svy commands) in STATA were used to obtain weighted estimates.

Table A 6.3. Association of multiple heterosexual partners (2 or more) in the past year with birth cohort, marital status, partnership status, education, religious affiliation, and early first heterosexual intercourse for men and women (univariate analysis)

	Men				Women			
	2+ partners[a]				2+ partners[a]			
	%	Base	OR[b]	p value (95% CI[c])	%	Base	OR[b]	p value (95% CI[c])
Birth cohort (age[d])								
1950-1964 (35-49)	17.2	394	1	p<0.01	2.1	413	1	p<0.01
1965-1974 (25-34)	21.2	250	1.3	(0.8-2.0)	5.1	255	2.4	(0.9-6.3)
1975-1982 (18-24)	31.8	195	2.2	(1.6-3.2)	18.7	187	10.5	(4.8-23.2)
Marital status								
Married/cohabitation	13.5	500	1	p<0.01	1.7	608	1	p<0.01
Separated/divorced/widowed	48.6	14	6.1	(1.7-21.5)	10.5	34	6.6	(1.8-25.1)
Single	33.4	324	3.2	(2.2-4.7)	20.0	212	14.2	(7.0-28.5)
Current partnership status								
Married/cohabitation[a]	13.9	496	1	p<0.01	1.7	605	1	p<0.01
Steady partner[a] (not cohabitation)	29.2	139	2.6	(1.6-4.1)	19.2	127	13.4	(6.4-28.2)
No partner[a] currently	39.1	184	4.0	(2.7-5.9)	20.8	104	14.8	(6.9-31.7)
Education								
<2nd stage secondary	16.6	369	1	p=0.01	5.7	315	1	p=0.07
2nd stage secondary	26.0	349	1.8	(1.2-2.5)	8.8	363	1.6	(0.9-2.9)
3rd level	25.8	120	1.8	(1.0-3.1)	4.0	176	0.7	(0.3-1.7)
Religious affiliation								
Roman Catholic	18.8	554	1	p=0.01	5.8	557	1	p=0.08
None	28.1	241	1.6	(1.1-2.6)	8.9	256	1.6	(0.9-2.6)
Early FHI[e] (before age 16)								
No	19.6	705	1	p<0.01	5.76	789	1	p<0.01
Yes	34.4	129	2.1	(1.4-3.2)	18.5	63	3.8	(2.2-6.8)

a - heterosexual partners only
b - odds ratio
c - confidence interval
d - approximate age at interview
e - first heterosexual intercourse

Methods for complex survey data (svy commands) in STATA were used to obtain weighted estimates. Logistic regression for survey data was used to compute pseudo-maximum likelihood estimates of odds ratios together with 95% CI and results of adjusted Wald tests for significance. Numbers of individuals (bases) included in analyses vary according to the number of missing values for individual variables. Four individuals who reported FHI at a younger age than first heterosexual experience were excluded from analysis of association with early FHI. All individuals with "other religious affiliations than Roman Catholic" were excluded from analyses.

Table A 6.4. Association of 10 or more heterosexual partners during lifetime with birth cohort, marital status, education, religious affiliation, and early first heterosexual intercourse form men and women (univariate analysis)

	Men				Women			
	10+ partners[a]				10+ partners[a]			
	%	Base	OR[b]	p value (95% CI[c])	%	Base	OR[b]	p value (95% CI[c])
Birth cohort (age[d])								
1950-1964 (35-49)	31.3	389	1	p=0.01	6.3	407	1	p=0.72
1965-1974 (25-34)	28.9	251	0.9	(0.6-1.3)	4.8	252	0.8	(0.3-1.7)
1975-1982 (18-24)	19.1	196	0.5	(0.4-0.8)	5.0	184	0.8	(0.4-1.6)
Marital status								
Married	28.2	387	1	p=0.05	3.5	501	1	p=0.01
Cohabiting	33.7	105	1.3	(0.8-2.1)	6.3	100	1.9	(0.7-4.7)
Separated/divorced/widowed	56.8	17	3.3	(1.0-10.9)	15.0	34	4.9	(1.5-15.7)
Single	23.7	327	0.8	(0.5-1.1)	8.7	209	2.6	(1.4-5.0)
Education								
<2nd stage secondary	25.6	367	1	p=0.51	3.8	312	1	p<0.01
2nd stage secondary	29.5	348	1.2	(0.9-1.7)	4.0	356	1.1	(0.5-2.3)
3rd level	29.2	121	1.2	(0.7-2.0)	12.1	174	3.5	(1.6-7.6)
Religious affiliation								
Roman Catholic	25.3	547	1	p=0.10	5.3	551	1	p=0.60
None	32.1	242	1.4	(0.9-2.1)	6.3	251	1.2	(0.6-2.3)
Early FHI[e] (before age 16)								
No	22.4	706	1	p<0.01	4.7	779	1	p<0.01
Yes	57.5	126	4.7	(3.0-7.2)	14.0	62	3.5	(1.7-7.3)

a – heterosexual partners only
b - odds ratio
c - confidence interval
d – approximate age at interview
e – first heterosexual intercourse

Methods for complex survey data (svy commands) in STATA were used to obtain weighted estimates. Logistic regression for survey data was used to compute pseudo-maximum likelihood estimates of odds ratios together with 95% CI and results of adjusted Wald tests for significance. Numbers of individuals (bases) included in analyses vary according to the number of missing values for individual variables. Four individuals who reported FHI at a younger age that first heterosexual experience were excluded from analysis of association with early FHI. All individuals with "other religious affiliations than Roman Catholic" were excluded from analyses.

Table A 6.5. Distribution of reported numbers of occasions of heterosexual intercourse in the past month for men and women by current partnership status

	Men				Women			
	Married cohabiting	Steady partner[a]	No steady partner[a]	All	Married cohabiting	Steady partner[a]	No steady partner[a]	All
0	6.2%	11.7%	70.6%	23.2%	5.9%	8.6%	83.6%	16.9%
1	4.2%	1.4%	3.2%	3.5%	5.7%	1.9%	5.3%	5.0%
2	7.4%	5.5%	3.4%	6.1%	8.4%	7.8%	3.7%	7.7%
3-4	17.5%	16.4%	8.9%	15.2%	20.5%	12.2%	5.1%	17.1%
5-9	29.4%	24.1%	7.0%	22.9%	30.4%	33.9%	1.7%	26.9%
10-19	31.2%	32.0%	5.2%	24.9%	25.4%	27.8%	0.0%	22.3%
20-29	3.7%	7.5%	1.6%	3.8%	3.6%	6.8%	0.6%	3.7%
30+	0.4%	0.1%	0.0%	0.5%	0.3%	1.0%	0.0%	0.4%
Mean[b]	7.56	8.27	1.71	6.12	6.82	7.93	0.53	6.01
SD[c]	6.31	7.03	3.71	6.45	5.18	7.54	2.19	5.80
Median	6	7	0	5	6	7	0	5
99[th] percentile	28	32	20	25	20	32	8	20
Base (100%)	439	136	189	763	542	119	104	765

a - at the time of the survey
b - mean is not the most appropriate summary measure as the distribution is skewed
c - standard deviation

Methods for complex survey data (svy commands) in STATA were used to obtain weighted estimates.

Table A 6.6. Distribution of reported numbers of occasions of heterosexual intercourse in the past month for men and women by birth cohort (age at interview) among individuals with at least one heterosexual partner in the past year

	Men				Women			
	Birth cohort (age[a])				Birth cohort (age[a])			
	1950-1964 (35-49)	1965-1974 (25-34)	1975-1982 (18-24)	All	1950-1964 (35-49)	1965-1974 (25-34)	1975-1982 (18-24)	All
0	9.7%	13.3%	29.9%	15.2%	7.9%	7.3%	19.8%	10.1%
1	4.9%	3.9%	2.8%	4.1%	6.9%	3.6%	4.7%	5.4%
2	7.0%	7.6%	4.4%	6.7%	9.8%	8.0%	4.7%	8.2%
3-4	18.2%	16.7%	14.4%	16.9%	19.9%	18.2%	15.8%	18.5%
5-9	30.3%	22.4%	18.0%	25.2%	32.3%	27.3%	24.8%	29.2%
10-19	26.2%	31.8%	23.4%	27.4%	20.9%	30.9%	21.1%	24.1%
20-29	3.8%	4.3%	4.7%	4.1%	2.3%	4.1%	7.8%	4.0%
30+	0.0%	0.0%	2.5%	0.5%	0.0%	0.5%	1.2%	0.4%
Mean[b]	6.79	6.97	6.95	6.88	6.05	7.38	6.90	6.64
SD[c]	5.28	5.49	9.52	6.48	4.61	5.58	7.89	5.74
Median	6	6	4	6	5	6	5	5
99[th] percentile	25	20	50	28	20	20	30	20
Base (100%)	320	212	146	679	340	226	142	708

a - approximate age at interview
b - mean is not the most appropriate summary measure as the distribution is skewed
c - standard deviation

Methods for complex survey data (svy commands) in STATA were used to obtain weighted estimates.

Table A7.1. Association of infection with *Chlamydia trachomatis* with selected demographic, social and selected sexual behaviour characteristics among men and women (univariate analysis)

	Men				Women			
	%[a]	Base	OR[b]	(p value) 95% CI[c]	%[a]	Base	OR[b]	(p value) 95% CI[c]
Age (birth cohort[d])								
18-24 (1975-1982)	4.1	160	1	(0.456)	4.1	153	1	(0.028)
25-34 (1965-1974)	3.6	218	0.9	0.3-2.5	2.0	216	0.5	0.1-1.5
35-49 (1950-1964)	2.1	352	0.5	0.2-1.5	0.3	348	0.1	0.0-0.5
Marital status								
Married/cohabiting	2.3	438	1	(0.265)	1.3	517	1	(0.262)
Single/previously married[e]	3.9	293	1.7	0.7-4.4	2.4	200	1.9	0.6-5.5
Education								
<2nd stage secondary	2.2	326	1	(0.544)	1.5	275	1	(0.376)
2nd stage secondary	3.3	308	1.5	0.5-4.2	2.4	307	1.7	0.5-5.2
3rd level	4.6	96	2.2	0.5-9.1	0.0	135	-	
Religious affiliation								
Roman Catholic	2.6	480	1	(0.931)	1.2	471	1	(0.372)
None	2.7	212	1.0	0.4-3.1	2.0	209	1.7	0.5-5.3
Community size								
< 100 000	2.7	611	1	(0.392)	1.7	582	1	(0.742)
> 100 000	4.3	120	1.6	0.5-5.1	1.3	136	0.8	0.2-3.6
5+ partners[f] ever								
No	2.0	357	1	(0.122)	1.3	552	1	(0.225)
Yes	4.2	345	2.2	0.8-5.8	2.6	153	2.0	0.7-6.1
2+ partners[f] past year								
No	2.9	544	1	(0.527)	1.5	662	1	(0.525)
Yes	2.0	156	0.7	0.2-2.2	2.5	51	1.6	0.4-7.5
1+ new partners[f] past year								
No	2.8	541	1	(0.843)	1.6	635	1	(0.572)
Yes	3.1	168	1.1	0.4-3.2	0.9	72	0.6	0.1-4.4
Concurrency past year								
No	3.1	601	1	(0.226)	1.6	689	1	(0.541)
Yes	1.3	100	0.4	0.1-1.8	3.0	21	1.9	0.2-15.9
Partners[f] without condom use[g], past year								
0-1	1.0	70	1	(0.243)	1.2	50	1	(0.697)
2+	3.3	549	3.4	0.4-26.9	1.8	607	1.5	0.2-11.8
Early FHI[h] (before age 16)								
No	2.9	623	1	(0.900)	1.6	657	1	(0.723)
Yes	3.2	103	1.1	0.3-3.5	2.1	56	1.3	0.3-6.2

a - prevalence of *Chlamydia trachomatis* infection
b - odds ratio
c - confidence interval
d – approximate birth cohort
e – separated, divorced, widowed
f – heterosexual partners only
g – not used condoms on 100% of occasions of heterosexual vaginal and/or anal intercourse
h – first heterosexual intercourse

Methods for complex survey data (svy commands) in STATA were used to obtain weighted estimates. Logistic regression for survey data was used to compute pseudo-maximum likelihood estimates of odds ratios together with 95% CI and results of adjusted Wald tests for significance. All individuals who contributed urine specimen were included into analysis, 683 men and 764 women (unweighted count; weighted count: 730 men and 718 women), including 41 men and 38 women (unweighted count; weighted count: 29 men, 22 women), who reported not to have experienced the first heterosexual intercourse so far. Numbers of individuals (bases) included in analyses vary according to the number of missing values for individual variables. Four individuals who reported FHI at a younger age than first heterosexual experience were excluded from analysis of association with early FHI. All individuals with "other religious affiliations than Roman Catholic" were excluded from analyses.

Annex 1

Desired sample size calculations and implications of reduced sample size for the survey power and precision

1. Justification for the desired sample size

We aimed to recruit 8000 respondents 18 to 54 years old. Of these, due to differential response rates according to gender and age, we would expect approximately 3888 men and 4112 women. Expected numbers of respondents in different age groups and numbers of collected urine specimens (assuming 56% response for urine collection among participating men, 76% among women, and no difference in response according to age) are shown in Table 1.

Table 1: Expected numbers of respondents and collected urine specimens

	Males	Females	All	Urine specimens males	Urine specimens females	Urine specimens all
18-24	1008	904	1912	565	687	1252
25-34	984	1072	2056	551	815	1366
35-44	1016	1312	2328	569	997	1566
45-54	880	824	1704	493	626	1119
All	3888	4112	8000	2178	3125	5303

The proposed sample size would satisfy the following criteria:

1. to estimate the prevalence of different sexual behavioural patterns in different age groups of men and women with sufficient precision,
2. to recruit sufficient number of people with rare behavioural patterns associated with increased risk for HIV or STI to describe their demographic, social, behavioural and attitudinal characteristics,
3. to estimate the prevalence of *Chlamydia trachomatis* infection in different age groups of men and women with sufficient precision, and
4. to have sufficient power (80% or higher) to recognise as significant (at the 95% confidence level) moderate associations (e.g. odds ratio 2) of moderately frequent key demographic and behavioural characteristics (above 10%) with *Chlamydia trachomatis* infection.

Simple random sampling was assumed for all sample size calculations. Since a two-stage probability sampling strategy was to be used, power and precision would be somewhat lower than those given below. Guestimates for likely design effects for most variables are in the range of 1.3 to 1.5, resulting in the design factors ranging from 1.1 to 1.2.

Given this desired sample size, expected absolute precision of prevalence estimates for different behaviours for males and females and for 4 age groups of males and females according to different prevalence of behavioural characteristics are given in Table 2.

Table 2: Expected gender and age-group specific precision of prevalence estimates according to prevalence of behavioural characteristic

		Prevalence of behavioural characteristic				
		2%	5%	10%	20%	50%
Males	18-24	+/-0.9%	+/-1.3%	+/-1.9%	+/-2.5%	+/-3.1%
	25-34	+/-0.9%	+/-1.4%	+/-1.9%	+/-2.5%	+/-3.1%
	35-44	+/-0.9%	+/-1.3%	+/-1.8%	+/-2.5%	+/-3.1%
	45-54	+/-0.9%	+/-1.4%	+/-2.0%	+/-2.6%	+/-3.3%
	All	+/-0.4%	+/-0.7%	+/-0.9%	+/-1.3%	+/-1.6%
Females	18-24	+/-0.9%	+/-1.4%	+/-2.0%	+/-2.6%	+/-3.3%
	25-34	+/-0.8%	+/-1.3%	+/-1.8%	+/-2.4%	+/-3.0%
	35-44	+/-0.8%	+/-1.2%	+/-1.6%	+/-2.2%	+/-2.7%
	45-54	+/-1.0%	+/-1.5%	+/-2.0%	+/-2.7%	+/-3.4%
	All	+/-0.4%	+/-0.7%	+/-0.9%	+/-1.2%	+/-1.5%

For example, we would have adequate statistical power (80%) to detect as significant (at the 95% confidence level) a difference of 2.9% or greater in the proportion of women reporting sex before the age of 16 between those aged 25-34 and those aged 18-24.

We would expect to recruit approximately 152 individuals with 10 or more heterosexual partners during preceding 5 years, 86 men who had ever paid for sex, 12 men who had homosexual sex during preceding 5 years, and 40 people who had ever injected illicit drugs.

We would expect to estimate Slovenian national prevalence of *Chlamydia trachomatis* infection amongst those aged 18-54 with absolute precision of +/-0.8% for men and +/-0.7% for women, assuming 4% overall prevalence. We would have adequate statistical power (80%) to detect as significant (at the 95% confidence level) a 3.5% or greater difference in prevalence of infection between different age groups of men and women (e.g. between 18-24 and 25-34 years old women).

Given this desired sample size, the expected power to recognise as significant (at the 95% confidence level) *Chlamydia trachomatis* infection associations with different behavioural characteristics according to different prevalence of these behavioural characteristics is presented in Table 3 for odds ratios of 1.5, 2, 3, or 5 and three hypothetical *Chlamydia trachomatis* infection prevalence (2%, 3%, and 4%) in the unexposed group. For example, we would have adequate statistical power (80%) to detect as significant (at the 95% confidence level) moderate associations (e.g. odds ratio 2) between *Chlamydia trachomatis* infection and key demographic and behavioural characteristics (e.g. marital status and 10 or more lifetime heterosexual partners).

Table 3: Expected power to recognise as significant (at the 95% confidence level) *Chlamydia trachomatis* infection associations with different behavioural characteristics according to different prevalence of these behavioural characteristics (assuming 2%, 3%, and 4% prevalence in unexposed group)

Prevalence of behavioural exposure	Power for different Odds Ratios											
	1.5			2			3			5		
	Assumed chlamydia infection prevalence in unexposed			Assumed chlamydia infection prevalence in unexposed			Assumed chlamydia infection prevalence in unexposed			Assumed chlamydia infection prevalence in unexposed		
	2%	3%	4%	2%	3%	4%	2%	3%	4%	2%	3%	4%
2%	12%	17%	21%	34%	46%	55%	74%	86%	93%	97%	100%	100%
5%	25%	34%	42%	64%	78%	87%	96%	99%	100%	100%	100%	100%
10%	40%	54%	66%	86%	95%	98%	100%	100%	100%	100%	100%	100%
20%	61%	77%	87%	97%	100%	100%	100%	100%	100%	100%	100%	100%
50%	78%	91%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%

2. Implications of reducing the sample size

As difficulties to obtain the funding to survey 8000 individuals were anticipated, reducing the desired sample size and consequent implications for defined objectives were considered.

The following parameters were used to consider the impact of sample size reduction, possible narrowing of respondents' age span and twice over-sampling those aged 18 to 34 years:

1. change in precision of prevalence estimates of diverse sexual behavioural patterns in men and women of different age spans and in different age groups separately for men and women,
2. change in expected numbers of people with rare behavioural patterns known to be associated with increased risk for HIV or STI,
3. change in precision of prevalence estimates of *Chlamydia trachomatis* infection in men and women of different age spans, and
4. Change in power to detect difference in prevalence of *Chlamydia trachomatis* infection between 18-24 and 25-34 years old men and women (separately).

Change of precision and power for these parameters was estimated for three different reductions in the survey sample size, 6000, 4000, and 2000 respondents, which roughly corresponded to obtaining 3/4, 1/2, or 1/4 of estimated resources needed to survey 8000 people.

Simple random sampling was assumed for all calculations. Since a two-stage probability sampling strategy was to be used, power and precision would be somewhat lower than those given below.

Preliminary estimated parameters from the feasibility study data were used for all calculations. Prevalence estimates for rare behavioural patterns in different age groups of respondents are presented in Table 4. Expected numbers of male and female respondents and urine specimens collected in different age groups according to gender and age specific response rates and gender specific participation rates for urine collection are presented in Tables 5 and 6. Several hypothetical distributions of male and female respondents in different age groups were used for the purpose of exploring the implication of twice over-sampling respondents aged 18 to 34 years (Table 7).

Changes in chosen parameters with reducing the sample size, narrowing respondents' age span and twice over-sampling younger age groups (18-24 and 25-34) are presented in Table 8.

Table 4: Preliminary age groups specific prevalence estimates for rare behavioural patterns in the feasibility study

	Age group specific prevalence estimates			
Behavioural pattern	18 – 54 years old	18 – 44 years old	18 – 34 years old	35 – 54 years old
10 or more heterosexual partners last 5 years	1.9%	1.9%	2.4%	1.4%
Ever paid for sex (men only)	2.2%	1.4%	0.5%	4.0%
Homosexual sex during preceding 5 years (men only)	0.3%	0.4%	0.5%	0.0%
Ever injected illicit drugs	0.5%	0.7%	0.8%	0.3%

3. Decision on respondents' age span and over sampling the young

When eventually, funding for surveying only close to 2000 individuals was ensured and there were some prospects to obtain additional funding, we considered potential public health policy use of the survey results and decided to use three priority criteria:

1. to obtain useful information on infection with *Chlamydia trachomatis* in the presumably most affected age group 18 to 24 years old,
2. to keep as large age span of respondents as possible to provide for the baseline description of sexual behaviour of Slovenian general population, and
3. to provide for the comparability of results with several national sexual behaviour surveys recently conducted in several countries of the European Union, where the minimum age span 18 to 49 years old was agreed upon.

Thus, we resolved to include into the main survey the individuals 18 to 49 years old and to sample those aged 18 to 24 with twice the probability in comparison to others.

Tables 5 and 6: Expected distributions of respondents according to gender and age specific response in the feasibility study with different sample size

Age	Number of respondents											
	8000				6000							
	18 - 54 years old				18 – 54 years old				18 - 44 years old			
	Respondents		Urine specimens		Respondents		Urine specimens		Respondents		Urine specimens	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
18-24	1008	904	565	687	756	678	423	515	960	858	538	652
25-34	984	1072	551	815	738	804	413	611	936	1020	524	775
35-44	1016	1312	569	997	762	984	427	748	927	1254	519	953
45-54	880	824	493	626	660	618	370	470	-	-	-	-
All	3888	4112	2178	3125	2916	3084	1633	2344	2868	3132	1581	2380

Age	Number of respondents																			
	4000												2000							
	18 - 54 years old				18 - 44 years old				18 - 34 years old				18 - 44 years old				18 - 34 years old			
	Respondents		Urine specimens		Respondents		Urine specimens		Respondents		Urine specimens		Respondents		Urine specimens		Respondents		Urine specimens	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
18-24	504	452	283	343	639	572	358	434	1016	996	569	757	320	286	179	217	508	454	284	345
25-34	492	536	276	407	628	679	352	516	908	1080	508	821	312	340	175	258	498	540	279	410
35-44	508	656	285	498	647	835	362	635	-	-	-	-	324	418	181	318	-	-	-	-
45-54	440	412	246	313	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All	1944	2056	1089	1562	1916	2086	1072	1585	1924	2076	1077	1578	956	1044	535	793	1006	994	563	755

Table 7: Hypothetical distributions of respondents aged 18-54 or 18-44 with twice over-sampling aged 18-34 in different sample sizes

Age	Number of respondents																			
	8000				6000								4000						2000	
	18-54				18-54				18-44				18-54				18-44		18-44	
	Respondents		Urine specimens		Respondents		Urine specimens		Respondents		Urine specimens		Respondents		Urine specimens		Respondents		Urine specimens		Respondents		Urine specimens	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
18-24	1333	1333	746	1013	1000	1000	560	760	1200	1200	672	912	666	666	373	506	800	800	448	608	400	400	224	304
25-34	1333	1333	746	1013	1000	1000	560	760	1200	1200	672	912	666	666	373	506	800	800	448	608	400	400	224	304
35-44	667	667	373	510	500	500	280	380	600	600	336	456	334	334	187	254	400	400	224	304	200	200	112	152
45-54	667	667	373	510	500	500	280	380	-	-	-	-	334	334	187	254	-	-	-	-	-	-	-	-
All	4000	4000	2238	3046	3000	3000	1680	2280	3000	3000	1680	2280	2000	2000	1120	1520	2000	2000	1120	1520	1000	1000	560	760

Table 8: Implications of sample size reduction, narrowing age span and twice over-sampling respondents aged 18-34

Parameters for considering implications of sample size reduction	Number of respondents													
	8000		6000				4000					2000		
	Over-sampling		Over-sampling				Over-sampling					Over-sampling		
	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	NO	YES	NO
	ages 18 - 54	ages 18 - 54	ages 18 - 54	ages 18 - 54	ages 18 - 44	Ages 18 – 44	ages 18 - 54	ages 18 - 54	ages 18 - 44	ages 18 - 44	ages 18 - 34	ages 18 - 44	ages 18 - 44	ages 18 - 34
Precision of prevalence estimates for behaviour patterns&														
in males	+/-1.6%	+/-1.5%	+/-1.8%	+/-1.8%	+/-1.8%	+/-1.8%	+/-2.2%	+/-2.2%	+/-2.2%	+/-2.2%	+/-2.2%	+/-3.2%	+/-3.1%	+/-3.1%
In females	+/-1.5%	+/-1.5%	+/-1.8%	+/-1.8%	+/-1.7%	+/-1.8%	+/-2.1%	+/-2.2%	+/-2.1%	+/-2.2%	+/-2.1%	+/-3.0%	+/-3.1%	+/-3.1%
In 18-24 and 25-34 age groups	+/-3.3%	+/-2.7%	+/-3.8%	+/-3.1%	+/-3.3%	+/-2.8%	+/-4.6%	+/-3.9%	+/-4.1%	+/-3.5%	+/-3.3%	+/-5.8%	+/-4.9%	+/-4.6%
In 35-44 and 45-54 age groups	+/-3.4%	+/-3.8%	+/-3.9%	+/-4.4%	-	-	+/-4.8%	+/-5.4%	-	-	-	-	-	-
Expected numbers of people with rare behaviour patterns														
> 9 heterosexual partners last 5 years	152	165	114	124	114	132	76	83	76	88	96	38	44	48
ever paid for sex (men only)	86	66	64	50	40	36	43	34	27	24	10	13	12	5
homosexual sex last 5 years (men only)	12	13	9	10	11	12	6	7	8	8	10	4	4	5
ever injected drugs	40	51	30	38	42	42	20	25	28	28	32	14	14	16
Expected precision of prevalence estimates for chlamydia infection														
in males	+/-0.8%	+/-0.8%	+/-0.9%	+/-0.9%	+/-1.0%	+/-0.9%	+/-1.2%	+/-1.1%	+/-1.2%	+/-1.1%	+/-1.2%	+/-1.7%	+/-1.6%	+/-1.6%
In females	+/-0.7%	+/-0.7%	+/-0.8%	+/-0.8%	+/-0.8%	+/-0.8%	+/-1.0%	+/-1.0%	+/-1.0%	+/-1.0%	+/-1.0%	+/-1.4%	+/-1.4%	+/-1.4%
Power* to detect difference in prevalence of chlamydia infection														
between males aged 18-24 and 25-34	3.3%	2.8%	3.8%	3.3%	3.4%	3.0%	4.7%	4.0%	4.1%	3.7%	3.4%	5.9%	5.2%	4.6%
between females aged 18-24 and 25-34	3.0%	2.4%	3.4%	2.8%	3.1%	2.6%	4.2%	3.4%	3.7%	3.1%	2.8%	5.3%	4.5%	4.2%

& estimates are based on presumable behaviour pattern prevalence of 50%
* with 80% power and 95% significance

Annex 2

Abstract "Feasibility of testing for *Chlamydia trachomatis* in a general population sexual behaviour survey in Slovenia" presented at the conference "Sexually transmitted Diseases in a Changing Europe", Rotterdam, Netherlands, April 13-15, 2000

ABSTRACTS

Sexually Transmitted Diseases in a Changing Europe

13-15 April, 2000

Rotterdam, The Netherlands

Abstract 65

Feasibility of testing for *Chlamydia trachomatis* in a general population sexual behaviour survey in Slovenia.

Klavs I[1], Rodrigues CL[2], Wellings K[2], Keše D[3], Švab I[1], [1] Institute of Public Health of the Republic of Slovenia, Ljubljana, Slovenia, [2] London School of Hygiene and Tropical Medicine, London, United Kingdom, [3] Institute of Microbiology and Immunology, Ljubljana, Slovenia.

Objectives: To assess acceptability of first void urine specimens collection to be tested for *Chlamydia trachomatis* by assessing overall participation rate among respondents in a pilot general population sexual behaviour survey, and to obtain information needed for planning the main survey.

Material and methods: In 1997/98 we conducted a pilot cross-sectional general population survey of 755 randomly selected respondents. A combination of face to face interview with self administering more sensitive questions was used. A small sub-sample of 43 men and 40 women were invited to provide first void urine specimen after the interview. Specimens were tested for *Chlamydia trachomatis* by Amplicor PCR.

Results: A total of 24 male and 31 female respondents provided urine specimens. This resulted in 56% (95% CI 41% - 71%) participation rate among male respondents, 76% (95% CI 63% - 89%) among female, and an overall participation rate 66% (95% CI 56% - 76%). One man and 1 woman were diagnosed with *Chlamydia trachomatis* genital infection, resulting in estimated prevalence of 4% (95% CI 0% - 12%) among male and 3% (95% CI 0% - 9%) among female respondents, with an overall prevalence estimate 4% (95% CI 0% - 9%).

Annex 3

1st price in the category of "oral presentations"

for the presentation

"Klavs I, Rodrigues LC, Wellings K, Keše D, Švab I.

Feasibility of testing for *Chlamydia trachomatis* in a general population sexual behaviour survey in Slovenia"

at the conference

"Sexually transmitted Diseases in a Changing Europe",

Rotterdam, the Netherlands, April 13-15, 2000

'Sexually Transmitted Diseases in a Changing Europe'
Rotterdam, The Netherlands
April 13 – 15, 2000

Rotterdam, April 15, 2000

The undersigned hereby declares that

I. Klavs et al.

Institute of Public Health of the Republic of Slovenia

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has been awarded the 1st price (Dfl. 1.000,--)
in the category 'oral presentations'

Title presentation:

'Feasibility of testing for Chlamydia trachomatis in a general population sexual behavior survey in Slovenia'

Willem I. van der Meijden, MD PhD
Chairman Organizing Committee

Roel P. Verkooyen
Chairman Scientific Committee

Annex 4

Klavs I, Rodrigues LC, Wellings K, Keše D, Švab I.

Feasibility of testing for *Chlamydia trachomatis* in a general population sexual behaviour survey in Slovenia.

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International Journal of STD & AIDS 2002; **13** (Suppl. 2): 5–8

Feasibility of testing for *Chlamydia trachomatis* in a general population sexual behaviour survey in Slovenia

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Summary: Our objective was to assess the feasibility of integrating first void urine (FVU) specimens testing for *Chlamydia trachomatis* genitourinary infection into a general population sexual behaviour survey. A total of 752 randomly selected respondents aged 18 to 54 were enrolled into the survey. Face to face interviewing with self-administered sensitive questions was used. Overall survey response rate was 77.4%. A convenience sub-sample of 83 respondents were invited to provide FVU specimens for confidential testing for *C. trachomatis* genitourinary infection. Fifty-five complied. This resulted in 66% FVU specimen participation rate among targeted respondents. Two specimens tested positive by Amplicor polymerase chain reaction. High feasibility study overall response rate indicated good acceptability of the survey. It proved feasible to collect FVU specimens for *C. trachomatis* testing in the small sub-sample. Consequently, we proceeded with integration of testing for *C. trachomatis* into the ongoing main survey.

Keywords: ***C. trachomatis*** **testing, feasibility survey, sexual behaviour, Slovenia**

INTRODUCTION

Chlamydia trachomatis urogenital infection is presumably the most common curable sexually transmitted infection (STI) in Slovenia, as in many other European countries[1]. However, we have not developed a national prevention and control policy including screening for asymptomatic infections like some other countries[2–6]. Only 1.4 reported cases per 100,000 population in 1997[7] is an underestimated figure. Reliable information on the distribution of *C. trachomatis* urogenital infection in the general population, and sociodemographic as well as behavioural determinants of higher risk are needed to inform public health policy.

Recent availability of new diagnostic tests for *C. trachomatis* that have high sensitivity and specificity using first void urine (FVU) specimens[8] greatly improves the feasibility of integrating testing for this STI into representative surveys of the general population[9]. High compliance with FVU collection for *C. trachomatis* testing (above 80%) in a pilot study for the National Survey of Adolescent Males in US is encouraging[9].

In 1997 and 1998 we conducted a feasibility study for an STI and HIV-related behavioural survey in a representative sample of the Slovenian general population between 18 and 54 years old. Our aims were to assess acceptability of the study design, the chosen data collection method, data management and field work logistic needs on a random sample of more than 500 respondents.

Overall feasibility study response rate (reflecting survey acceptability) and FVU specimens participation rate in a small convenience sub-sample (reflecting preparedness of participants to be confidentially tested for *C. trachomatis*) are of specific relevance for assessing the feasibility of reliably estimating the distribution of *C. trachomatis* urogenital infection in the general population in the main survey. We also wanted to assess possible logistical barriers during FVU specimen collection, laboratory testing and referring infected individuals for treatment.

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METHODS

Sampling strategy

A total of 1000 individuals' addresses were obtained by a two-stage stratified random sampling from the

Central Population Registry. We sampled 100 first-stage sampling units with approximately 200 inhabitants with a probability proportional to size of the 18 to 54 years-old population, and randomly selected 10 individuals aged 18 to 54 years from each.

The questionnaires

Responses to less sensitive questions were collected in household interviews by interviewer-administered questionnaire (IAQ) and responses to intimate questions by self-administered questionnaire (SAQ) completed anonymously in the presence of interviewers. We adapted the questionnaires used in the national sexual behaviour survey conducted in 1990 and 1991 in the United Kingdom[10]. We added questions to estimate some preventive indicators proposed by the former World Health Organization Global Program for AIDS[11]. Comparability to numerous variables collected in the European Union project 'Sexual behaviour and risks of HIV infection in Europe'[12] was ensured.

Anonymity of data collected with SAQ

Anonymity for answers in the SAQ was ensured according to the request of the Medical Ethical Committee at the Ministry of Health that approved the study protocol. All interviewers received a list of randomly selected unique numbers to be used to link both questionnaires (IAQ and SAQ) for each respondent. Neither of these questionnaires contained any identifying information. A separate form to record visits to each address and their outcome was completed. These forms included identifying information on respondents and non-respondents, however, unique numbers allocated to individual respondents were not recorded on them. Completed visit record forms and completed IAQ and SAQ were entered separately at two different institutions. Thus, identities of respondents were no longer linked to the reported demographic, behavioural and attitudinal information.

First void urine specimens collection, confidential testing, linking of testing results with information reported by respondents and treatment of infected individuals

Four arbitrarily chosen interviewers working in the capital invited respondents to contribute their FVU specimens to be confidentially tested for *C. trachomatis*. After conclusion of interviewing, respondents were invited to read a letter explaining the aims of testing, assuring confidentiality and referral for treatment. If informed consent forms were signed, instructions were given on how to obtain FVU specimens. Specimens were labelled with unique respondents' identifying numbers. Both unique identifying number and respondent's name were recorded, on two separate parts of the laboratory report form. Specimens were transported to the laboratory in ice boxes within 24 hours after collection and tested for *C. trachomatis* with Amplicor polymerase chain reaction (PCR) within a week. The results were recorded on both parts of the laboratory report forms, with the unique identifying number and with the respondent's name. The forms were cut in two. Parts with unique identifying numbers were sent to the location where the testing results were anonymously linked to the demographic, behavioural and attitudinal information reported by respondents. Parts with testing results and respondents-identifying information were sent to a different location to enable confidential notification of infected respondents and analysis of the participation in FVU specimens collection. Infected respondents were referred for treatment and counselling. Their contacts were notified.

RESULTS

Overall survey response rate

Interviewers received addresses of 1000 Slovenian citizens. Of these, 2.9% were considered ineligible as they were reported to live abroad. Excluding these, 971 potentially eligible individuals were left constituting the overall response rate denominator. The overall response rate was 77.4% (Figure 1).

Participation in first void urine specimens collection

Of a total of 43 male and 40 female respondents invited to provide FVU specimen for *C. trachomatis* testing, 24 men and 31 women complied. This resulted in a 56% participation rate among male respondents, 76% among females, and an overall participation rate of 66%.

C. trachomatis infection prevalence estimates

The small convenient sub-sample study within the feasibility study for the sexual behaviour survey was not aimed at estimating the prevalence of *C. trachomatis* urogenital infection. The sub-sample was not representative of the general population of Slovenia. The results are presented nevertheless. One man and one woman were diagnosed with *C. trachomatis* urogenital infection, resulting in a prevalence of 4% among male and 3% among female respondents, with an overall prevalence of 4%.

DISCUSSION

The lack of national general population surveys that provide meaningful sexual behavioural and STI clinical data is universal[9], although results from numerous clinically-based studies cannot be extrapolated to the general population. The primary logistical barrier in adding STI testing to sexual behavioural surveys has been that blood or endocervical and urethral swab specimens were

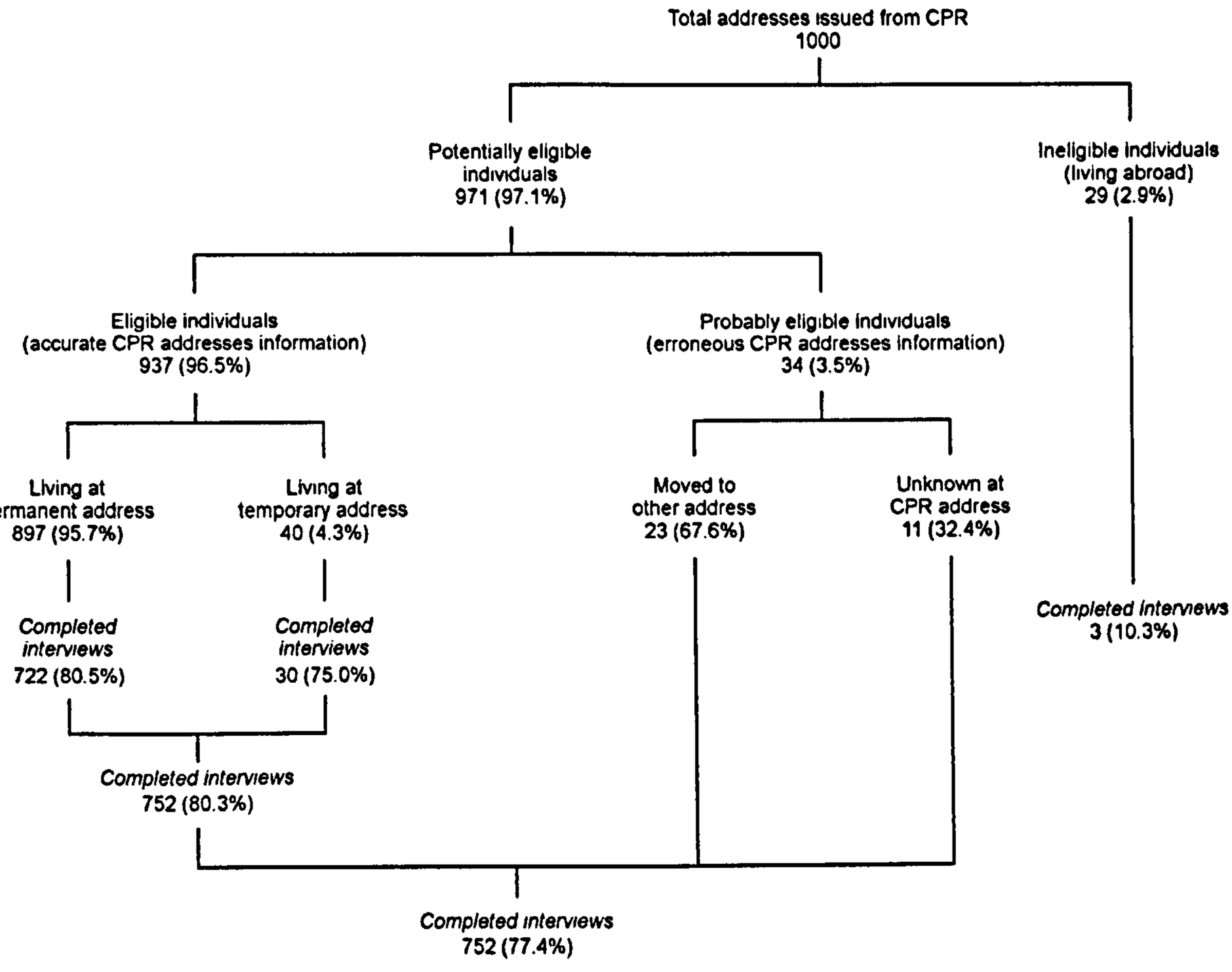

Figure 1. Overall response rate in the HIV- and STI-related behaviour feasibility survey of the general population in Slovenia (1998/1999)

required for clinical tests. Recent availability of new diagnostic tests for *C. trachomatis* and *Neisseria gonorrhoeae* that have high sensitivity and specificity, using FVU specimens[8], will greatly improve the feasibility of integrated representative surveys of STI and relevant behaviour[9].

High overall response rate in our feasibility survey reflected good acceptability of the planned general population sexual behaviour survey. It proved feasible to collect FVU specimens for *C. trachomatis* testing in a small convenience sub-sample.

Disappointingly, the participation rate for FVU specimens collection in the sub-sample was not as high as desired. As the numbers of respondents invited to contribute FVU specimens were small, the actual measured participation rate was a rather unreliable estimate of the one we might expect in the main survey. Also, targeted individuals were not randomly selected and it is well recognized that any response rate tends to be worse in the capital than elsewhere. As no major logistical barriers were encountered during FVU specimens collection, laboratory testing and referring infected persons for treatment and as the response for FVU specimens collection among the small sub-sample of survey respondents was considered high enough, we decided to proceed with integration of testing for *C. trachomatis* urogenital infection into the main survey.

The main survey field work started in 1999. All respondents were invited to provide FVU specimens. To simplify logistics and contain the cost of the main survey, collected FVU specimens were not transported to the laboratory within 24 hours after collection, but frozen within 24 hours after collection at interviewers homes (−20°C), transported to the laboratory in ice-boxes every two weeks and tested with Amplicor PCR in pools of five[13]. The interim estimated participation rate of approximately 80% for FVU specimens collection among the respondents is very encouraging.

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Annex 5

Abstract "Klavs I, Rodrigues LC, Wellings K, Weiss HA. Condom use at first heterosexual intercourse: Preliminary results of the general population sexual behaviour survey in Slovenia"

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AIDS IN EUROPE

4TH EUROPEAN CONFERENCE ON THE METHODS AND RESULTS OF SOCIAL AND BEHAVIOURAL RESEARCH ON AIDS

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CONDOM USE AT FIRST HETEROSEXUAL INTERCOURSE: PRELIMINARY RESULTS OF THE GENERAL POPULATION SEXUAL BEHAVIOUR SURVEY IN SLOVENIA

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Objectives: to assess the extent of condom use at first heterosexual intercourse (FHI), describe secular trends, and identify predictors for its use.

Material and methods: In 1999/2000 we conducted a population based probability sample survey of 1752 men and women aged 19 to 49 years. A combination of a face to face interview and anonymous self-administering of the more sensitive questions was used. Questions about the FHI were asked face to face. Methods for complex survey data in STATA were used for weighted analyses.

Results: Information on condom use at FHI was provided by 779 men and 844 women. Overall, 23.6% (95% CI 20.7% - 26.8%) of men and 21.3% (95% CI 18.6% - 24.2%) of women reported using condoms at FHI. However, among those who have experienced FHI during late nineties (1995-1999), condom use was reported by 71.8% men (95% CI 64.2%-78.2%) and 63.8% (95% CI 20.7%-26.8%) women. Irrespective of gender, the more recently the respondents were born and the more recently they experienced FHI, the more likely they were to use a condom. No other risk or protective factors were associated with condom use for women. Men who received information about sexual matters in school and those with the highest education were significantly more likely to use a condom. Those who experienced FHI before the age of 16 and those who were not in control at the event (drunk, carried away by feelings) were less likely to use a condom at FHI.

Conclusions: The secular increase in condom use at FHI in Slovenia has been striking. It is important to continue to provide information about sexual matters in school, as there is evidence that it is associated with higher likelihood of protected FHI among young men.