SLOVENE NATIONAL SURVEY OF SEXUAL LIFESTYLES, ATTITUDES AND HEALTH, 1999-2001: DATA COLLECTION METHODS

SLOVENSKA NACIONALNA PREČNA RAZISKAVA SPOLNEGA VEDENJA, STALIŠČ IN ZDRAVJA, 1999-2001: METODE ZBIRANJA PODATKOV

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Abstract

Aim: *A national survey on sexual lifestyles, attitudes and health, including integrated testing for Chlamydia trachomatis genital infection in a probability sample of Slovene men and women aged 18 to 49 years, was conducted to inform sexual and reproducive health policies on this issue. Particular attention was devoted to reducing measurement errors. The data collection methods are presented.*

Methods: *The field work for the cross-sectional study was conducted between 1999 and 2001. An introductory letter was sent to the selected individuals. Data were collected in respondents' homes through a combination of face-to-face interviews and anonymously self-administered questionnaires (pencil and paper). Respondents were asked in advance to seal the anonymously completed booklets themselves. The survey methods were adapted from the equivalent British survey conducted in 1990. Respondents were invited to provide a first void urine (FVU) specimen for polymerase chain reaction testing for C trachomatis. Specimens were frozen on the day of collection, stored at -20^{0}C, and transported to the laboratory in cold boxes every two weeks. To contain cost, a pool size of five samples was used for polymerase chain reaction testing. Individuals diagnosed with C. trachomatis infection were referred for treatment.*

Conclusion: *The data collection methods used in the restrained-resource setting proved very good. Possible limitations include validity constraints of self-reported information, yet anonymous self-administration of more sensitive questions probably contributed to improved validity. The methods for the transport, storage, and testing of urine specimens were sufficiently robust to ensure high sensitivity and specificity of laboratory results.*

Key words: sexual behaviour, sexually transmitted infections, Chlamydia trachomatis, human immunodeficiency virus, survey methods, general population, Slovenia

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Izvleček

Cilji: *Za poučeno spolno in reproduktivno zdravstveno politiko je bila v verjetnostnem vzorcu slovenskih moških in žensk, starih 18 do 49 let, izvedena nacionalna prečna raziskava spolnega vedenja, stališč in zdravja z vključenim testiranjem na genitalno okužbo z bakterijo Chlamydia trachomatis. Veliko pozornosti je bilo namenjene omejitvi napak pri merjenju. Predstavljene so metode zbiranja podatkov.*

Metode: *Terensko delo prečne raziskave je bilo izvedeno v letih 1999–2001. Izbrane osebe so prejele napovedno pismo. Podatki so bili zbrani na domovih sodelujočih s kombinacijo anketiranja v osebnem stiku in anonimnega samoizpolnjevanja vprašalnikov (svinčnik in papir). Sodelujoči so bili vnaprej obveščeni, da bodo sami zalepili*

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izpolnjene anonimne knjižice v kuverte. Metode so bile prirejene po podobni britanski raziskavi, ki je bila izvedena leta 1990. Sodelujoči so bili povabljeni, da prispevajo prvi curek urina za testiranja s polimerazno verižno reakcijo na okužbo z bakterijo C trachomatis. Vzorci so bili zamrznjeni na dan odvzema, shranjeni pri –20^0 C in na 14 dni prepeljani v laboratorij v hladilnih torbah. Zaradi prihranka je bil po en test s polimerazno verižno reakcijo izveden na pet združenih vzorcih. Osebe z okužbo z bakterijo C. trachomatis so bile napotene na zdravljenje.

Zaključki: *V okoliščinah z omejenimi sredstvi so bili podatki metodološko zelo dobro zbrani. Možne omejitve vključujejo vprašljivo verodostojnost podatkov, ki jih poročajo sami anketiranci, vendar je anonimno samoizpolnjevanje odgovorov na bolj občutljiva vprašanja verjetno prispevalo k večji verodostojnosti. Metode prenosa, hranjenja in testiranja vzorcev urina so bile dovolj stroge, da so zagotovile visoko občutljivost in specifičnost laboratorijskih rezultatov.*

Ključne besede: spolno vedenje, spolno prenosljive okužbe, Chlamydia trachomatis, virus človeške imunske pomankljivosti, metode prečne raziskave, splošno prebivalstvo, Slovenija

1 Introduction

To formulate appropriate and effective sexual and reproductive health policies, including prevention and treatment of sexually transmitted infections (STI) and infections with human immunodeficiency virus (HIV), it is crucial to understand sexual behaviour of the population and epidemiology of STI and HIV. Yet, no national sexual behaviour survey had been conducted in Slovenia by 1999. Two fertility surveys failed to collect adequate information on the sexual behaviour patterns relevant to STI and HIV epidemiology (1-3). Genital infection with Chlamydia trachomatis is the most common curable STI in Slovenia (4). In most infected women and in a large proportion of men, symptoms of C. trachomatis infection are minor or absent (5-10). This large group of asymptomatic and infectious persons sustain transmission in the community. Studies of convenience samples in the Slovene health care settings reported a prevalence of 6% to 16.5% among asymptomatic women, and of 2.7% to 3.2% for asymptomatic men (11-14). All these estimates were subject to selection bias. No prevalence estimate based on a probability sample of the general population had been made available by 1999.

To fill these gaps, the Institute of Public Health of the Republic of Slovenia (IPHRS) conducted the first national survey of sexual lifestyles, attitudes and health related to HIV and other STI, with integrated testing for C trachomatis genital infection. To ensure valid survey results, particular attention was devoted to reducing potential survey errors, including the measurement errors (15).

The aim of this article is to present the data collection methods used, to discus their strengths and limitations, and compare them to the methods used in similar surveys.

2 Survey methods

2.1 Reference population and sampling strategy

The cross-sectional study population consisted of Slovene citizens aged 18 to 49 years residing in Slovenia. The details of our stratified two-stage probability sampling, survey response, data weighting, and sample representativeness were published previously (16). Briefly, we used stratified two-stage probability sampling of 18-49-year–old persons with oversampling of the 18-24-old age group.

2.2 Recruitment and training of interviewers

The fieldwork was started in September 1999 after we had obtained funds to interview approximately 1,000 individuals, and had prospects to obtain funding to interview additional 1000 individuals. Altogether 39 female interviewers were recruited from the pool of interviewers of the Statistical Office of the Republic of Slovenia and trained by the principal investigator, the first 22 at a full day workshop in November 1999, and since it appeared difficult to follow the very intensive full day training, the remaining 17 in two half days workshops, in February and March 2000.

Interviewers were instructed on how to conduct interviews as described bellow, and encouraged to provide reassurance during the initial contact. The need

for confidentiality was stressed and information was provided on how to appropriately inform the person to obtain informed consent. The procedures to ensure anonymous collection of most sensitive information while still preserving the link between all information reported by each individual were explained. The interviewers were urged to insist on conducting the interview in privacy. To encourage respondents to answer honestly and to prevent mistakes, the greatest emphasis was placed on role-playing the introduction of anonymous questionnaires for self-completion.
Within a week after the training and after the first few interviews were conducted, the principal investigator visited all interviewers and provided individual feedback on whether the first few interviewer-administered questionnaires and all other forms were completed correctly. The skills to introduce the self-administered booklets were reassessed and reinforced.

2.3 Advance letters

Before the visit of the interviewers, all selected individuals received an advance letter explaining the survey goals, and informing them that they had been randomly selected from the general population and invited to participate. The letter included information about the collaborating institutions and funding agencies. It was pointed out that more intimate details would be collected anonymously, and that for the success of the survey it was important for each invited individual to contribute his or her own experiences and attitudes, whatever they may be.

2.4 Interviewing procedures

The interviewing procedures were adapted from the British National Survey of Sexual Attitudes and Lifestyles (NATSAL) conducted in 1990 (17). They were pre-tested and piloted in a feasibility study (18). The methods were very similar to those used in the second British NATSAL conducted in 2000 (19).
At least five calls at different days of the week and at different times of the day were made before an address was considered as a non-contact. Details of all visits to the selected addresses, their outcome, and information on the ascertained residence status were entered in visit record forms.
At the doorstep, interviewers introduced themselves and showed their interviewers' ID card bearing their 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. It assured them that most intimate questions would be answered anonymously and that they had the right to refuse to participate in the study, to interrupt the interview at any point or just not to answer an individual question. The leaflet also listed the interviewers' professional duties, and provided information about the research team, the participating institutions, and the funding sources. The research team address was given at the end, in case further information would be sought. The leaflet was left with the respondent. Additional explanation was provided only upon request. As it was anticipated that some individuals would claim that their particular sexual lifestyle was not relevant for such a survey, the 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 in order to get the most accurate possible results, valid to the population as a whole.
After verbal informed consent had been obtained, interviewing started with less sensitive interviewer-administered questions about health, family and religious affiliation, which facilitated the development of good rapport. Then, show cards with letter pre-coded answers were introduced to facilitate the answering of more sensitive questions asking about sources of information on sexual matters and age at first heterosexual experience and information about first heterosexual intercourse. This presumably resulted in less discomfort for respondents as well as interviewers, as possibly embarrassing sex related words were avoided by using letter codes for answers.
Respondents who reported their age at first heterosexual intercourse were asked several questions about the event. A great majority were interviewed face-to-face. An alternative to completing a self-administered booklet was provided, if interviewers judged that it was not private.
Respondents who reported their age at first heterosexual intercourse or some other sexual experience were invited to complete anonymously four self-administered questionnaires in the presence of the interviewer. Sexual experience was defined as any kind of contact with another person that respondent felt as sexual (e.g. kissing, touching, intercourse, or any other form of sex). The booklets included questions about sexual behaviour, injecting drug use, and history of STI. Each of the four booklets was briefly introduced. To prevent mistakes, instructions included hypothetical examples about how to answer the most important and the most difficult questions and how to skip inappropriate questions. It was stressed in advance, that interviewers

would not see the answers, but would be willing to provide additional explanations by hypothetical examples and using another empty questionnaire. Respondents were told in advance, that they would themselves seal the anonymously completed booklets in envelopes with the IPHRS logo.
The interviewer-administered questions about attitudes of the respondents followed. The aim of this sequence was to minimize social desirability bias for the anonymously reported behaviour. For example, if in a face-to-face interview the respondents were asked earlier whether they approve of 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 inaccurately at the end of a rather long interview.
Finally, respondents were thanked for their important contribution and given tee shirts with the IPHRS logo, a symbolical reward for the time and effort they spent on the task. This timing, just before asking for a urine specimen, was intentional and aimed at increasing the urine specimen contribution rate.

2.5 Ensuring anonymity of intimate information

All interviewers received a list of as many randomly selected unique numbers as addresses of the individuals selected. They were instructed to use one of these unique numbers to link the interviewer-administered questionnaire and the self-administered questionnaires for each respondent. The questionnaires did not contain identifying information. In contrast, forms to record visits to the selected individuals' addresses and their outcomes contained identifying information about respondents as well as non-respondents, but the allocated respondents' unique numbers were not recorded on these. Two data sets, the visits' records data set and the main data set, including information reported confidentially and anonymously by respondents, were entered separately at two different locations, at the IPHRS and at the CATI Centre Ljubljana. Thus, the identity of each respondent was unlinked from the demographic, behavioural and attitudinal information reported.

2.6 Collection and storage of urine specimens

After the interview, respondents were asked for additional few minutes of their time ; they were invited to participate in the extended study by contributing a urine specimen to be confidentially tested for C. trachomatis. They were offered to read a letter explaining the aims of such testing. The letter stressed confidentiality of testing results and pointed out that in the case of a positive result, the respondent would be notified within a month and referred for treatment. If the respondent agreed to the proposed testing, the informed consent form was signed, and instructions were given on how to obtain a FVU specimen. Each specimen was labelled with the unique respondent identifying number. Both the unique identifying number and the respondent's name were entered in a laboratory report form, however, on two different parts to be separated later. All specimens were transported in cold boxes to interviewers' homes where they were frozen on the day of collection and stored at -20^{0}C in small freezers provided for this purpose.

2.7 Transport of urine specimens and data from the field, and field work supervision

Frozen urine specimens were collected from interviewers' homes every two weeks and transported to the laboratory in cold boxes. Signed informed consent forms for urine specimen collection, laboratory forms, completed questionnaires, reports on visits, forms giving temporary addresses or new permanent addresses to be reallocated to interviewers working in respective areas, and reports on the number of completed interviews, collected urine specimens and mileage were collected at the same time. These regular visits of the principal investigator or another member of the research team made it possible to monitor closely the field work progress and to address any interviewers' queries in a timely manner.

2.8 Laboratory testing for C. trachomatis

AMPLICOR polymerase chain reaction (PCR) tests for C. trachomatis were performed on thawed FVU specimens according to the manufacturer's instructions (Roche Diagnostic Systems, Basel, Switzerland) (20). The AMPLICOR internal control detection was also included in the PCR assay according to the producer's instructions to identify inhibitory specimens and assure the integrity of negative results (21-23). To contain test costs, pooling of urine specimens in groups of five was used (24, 25). Specimens from reactive pools were re-tested 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 the Ljubljana 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 IPHRS for confidential notification of infected respondents and analysis of the participation in urine specimen collection.

2.9 Notification of infected individuals

Individuals diagnosed with C. trachomatis infection were sent a letter notifying them about the positive result. Men were referred for treatment to their general practitioner and women were advised to choose between their general practitioner and gynecologist. In addition to the details about the test result the letter included recommendations for treatment, some information about the survey and a suggestion that contacts should be notified and treated, which was partly intended to guide the treating physicians. Charge free case management according to the recommendations of the Centers for Diseases Control and Prevention that included counseling and contact notification was offered at the Central Dermato-venerological outpatient clinic in Ljubljana, if preferred (5).

2.10 Time frame

The first series of interviews was started in November 1999 and covered the central, northern, and north eastern parts of Slovenia, and the second series of interviews in the rest of the country were started in February 2000. This geographical split simplified the logistics of the transport of urine specimens and other survey materials from the field, and reduced the costs of storing frozen FVU specimens at interviewers' homes, as the refrigerators used in the first series could be reallocated to different interviewers conducting the second series of interviews. The last six interviews were conducted in 2001, the very last one in February. This long fieldwork also made it possible to obtain the funding from the Ministry of Health during two consecutive fiscal years.

2.11 Ethical clearance

The Medical Ethics Committee at the Ministry of Health of the Republic of Slovenia consented to the proposed study on 17 October 1997, under the condition that more sensitive information was acquired anonymously. In addition, ethical clearance of the London School of Hygiene and Tropical Medicine Ethics Committee was obtained in December 1999.

3 Discussion

Various data collection methods were used in the national HIV and STI-related sexual behaviour surveys. Face-to-face interviewing was used in surveys coordinated by the World Health Organization, and in the Netherlands (26, 27). Self-administering questionnaires were used in Germany and Spain, and postal surveys in Norway and Croatia (27-30). Postal self-administered short module on sexual behaviour was attached to the face-to-face fertility survey in Slovenia in 1996, but the response rate was very low (below 50%). Computer-assisted telephone interviewing (CATI) was used in Belgium, France, Germany, Scotland, Switzerland and in the US (27, 31-34). A combination of face-to-face interview and self-administration of more sensitive questions was used in the first survey conducted in Britain, Finland, Germany, Portugal and the US (17, 27, 35). The second British national survey used combination of computer-assisted personal interview (CAPI) and computer-assisted self-interview (CASI), with respondents keying responses to questions displayed on the screen (19).

It has been shown that respondents are more willing to reveal socially censured information in confidentially self-administered questionnaires or video-CASI than in face-to-face interviews (36). Studies comparing CASI with pencil and paper 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 (37). In contrast, the pilot study for the second national British survey found no evidence that CASI increased the reporting of risk behaviour when compared to pencil and paper self-administration of the same questions, but did demonstrate improved item response and data consistency (38). Audio-CASI has been reported to be superior in capturing sensitive sexual behaviour data and information on injecting drug use in the U.S. adolescent population in comparison to pencil and paper self-administering technique, and also in capturing HIV risk behaviour among injecting drug users in comparison to CAPI and CASI (39, 40). In our setting of constrained resources, we decided to adapt the data collection method used in the national Sexual Attitudes and Lifestyles Survey conducted in Britain in 1990 and 1991, a combination of face-to-face interview and self-administration of more intimate questions using pencil and paper (17). The method was pre-tested and used successfully in the feasibility study (18). However, piloting CASI or audio-CASI and comparing it to the pencil and paper self-administering technique should

be considered within preparations for any future national sexual behaviour survey in Slovenia.

In spite of all our efforts to improve the validity of the data obtained, possible limitations of our survey include validity constraints on self-reported sexual behaviour data that are inherent in all such surveys. Missreporting of sexual behaviour has been documented (41-43). Nevertheless, we believe that we managed to improve the veracity and thereby the validity of self-reported information on higher-risk sexual behaviour by providing the possibility of anonymous self-administration. Yet it is impossible to conclude from our results what the contribution of anonymity was in addition to self-administration. 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 self-administered questionnaires showed that anonymous self-administration captured some higher-risk sexual behaviour better than face-to-face interviewing. So nearly 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 anonymous self-administered questionnaire. Also, only half of respondents who reported some homosexual experience in the self-administered questionnaire did so when interviewed. However, the great majority of those who anonymously reported penetrative homosexual sex did tell interviewers that they had some homosexual experience.

We are confident that the type of specimens we collected, freezing specimens on the day of collection for storage, maintaining cold chain during storage and transport to the laboratory, and testing thawed specimens using PCR, ensured high sensitivity and specificity of our laboratory results (44-47). To circumvent the possible problem of FVU specimens containing inhibitors for PCR assay (48-50) and to ensure the validity of negative results, we used the internal control incorporated in the Amplicor PCR kit to identify inhibitory specimens. Based on previous reports (24, 51), we assume that sensitivity was not affected by PCR testing in pools of five urine specimens. In contrast, British researchers reported that they may have underestimated C trachomatis prevalence, as some loss of sensitivity may have occurred due to delays in specimen transport (52).

In conclusion, strengths of our survey methods included the use of well-tested and piloted data collection methods, a combination of face-to-face interviews and anonymously self-administered questionnaires (pencil and paper), adapted from one of the best national general population sexual behaviour surveys, the British NATSAL 1990 (17,18). In addition, high response rate and representativeness of our survey sample contributed to the validity of our results. Possible limitations included validity constraints of self-reported information common to all such surveys. However, we believe that in addition to self-administration, the possibility to answer the most sensitive questions anonymously contributed to improved validity of our data. It is possible that some other data collection method, e.g. CASI, would prove superior in capturing sensitive behaviour information. Our methods used for the transport, storage and testing of FVU specimens were robust enough to ensure high sensitivity and specificity of the laboratory results obtained.

The results of our survey have and will provide useful information to those who work in the delivery of reproductive health policies and HIV and STI prevention, and in the formulation of control strategies. So, the steep increase in condom use at first heterosexual intercourse suggests that HIV-related condom use promotion has had an impact (16). In contrast, a relatively high prevalence of genital C trachomatis infection among 18-24-year old Slovenians, in the presence of relatively low risk sexual behaviour and low reported incidence rates of chlamydial infection, suggest serious gaps in the diagnosis and treatment of the condition (53).

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Contributors:

Irena Klavs, the lead author, designed and coordinated the implementation of the study, and analysed and interpreted the results. Darja Keše coordinated the laboratory testing and participated in the preparation of this paper. Igor Švab contributed to the design of the study and participated in the preparation of this paper.

Conflict of interest: None.

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List of abbreviations:

CAPI	- computer assisted personal interviewing
CASI	- computer assisted self interviewing
CATI	- computer assisted telephone interviewing
FVU	- first void urine
HIV	- human immunodeficiency virus
IPHRS	- Institute of Public Health of the Republic of Slovenia
NATSAL	- National Survey of Sexual Attitudes and Lifestyles
PCR	- polymerase chain reaction
STI	- sexually transmitted infections

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