



Quantitative Report

Report on HIV/Syphilis prevalence
and risk behaviour among MSM



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1 INTRODUCTION

HIV infection remains an important public health issue in Europe, with evidence of continuing transmission in many countries. Accounting for almost one third (7,693) of all reported newly diagnosed HIV infections reported in 2006 in the European Union (EU) and European Free Trade Association (EFTA) countries, Men who have sex with men (MSM) continue to represent a population at high risk of HIV infection [1,2]. Data from 23 European countries show that the annual number of HIV diagnoses in MSM increased by 86% between 2000 and 2006 [2]. The results of some seroprevalence studies in gay community settings or healthcare services suggest levels of HIV prevalence between 10 and 20% among MSM, and available data suggest a possible hidden HIV epidemic in this population group [2,3].

In addition to the spread of HIV, an increase of high risk sexual behaviour among MSM is reported throughout Europe [1,2]. In this context, HIV testing has become a key surveillance activity for monitoring the HIV epidemic especially in hard-to-reach MSM. Since the introduction of highly active antiretroviral therapy (HAART), AIDS has become less indicative of the underlying trends in HIV infection. Another important factor linked to risk behaviour and risk of HIV transmission is the use of alcohol and other psychoactive drugs. According to the literature, alcohol and/or illicit drug consumption significantly increases the odds of having sex and have a significant positive association with the sexual risk. Several studies, both in Europe and the United States (U.S.), show a high percentage of MSM who use alcohol and drugs before and during sex and an association between these substances and sexual risk behaviour [4-6]. Additionally other studies suggest that even intermittent, recreational use of these drugs before or during sexual intercourse may lead to high-risk sexual behaviour (e.g. UAI), especially with casual partners [7,8]. Recent studies of the sexual risk behaviour of MSM have also described a range of changes in sexual risk-taking behaviour in MSM in recent years, with an increased number of partners in some countries. The number of partners proved to be one of the strongest predictors of unsafe sex; according to the literature, the probability of having had unsafe sex ranged from 17% in men with one partner to 58% in men with more than 20 partners [9-11].

Despite these findings, few studies targeted MSM using outreach methods collecting behavioural and biological data in line with Second Generation Surveillance System (SGSS) criteria [12,13] and United Nations General Assembly Special Session (UNGASS) indicators [3,14]. The Second Generation Surveillance System combines monitoring of newly diagnosed HIV cases and indicators of sexual behaviour among persons in groups at highest risk for infection.

Previous community-based surveys targeting MSM in Scotland, which included both questionnaires and anonymous oral fluid testing for HIV, found high levels of HIV prevalence and risk behaviour and low uptake of HIV testing [15]. The advantage of oral

fluid collection for testing of infection is evident as it is a minimally invasive method for serological monitoring which is easy and safe. It has proven to be acceptable for various target audiences and it does not require trained staff [16,17]. Therefore, the use of oral fluid as a means for biological testing is of crucial importance in order to gather valid and reliable information about the spread of HIV among hard to reach populations such as MSM.

Taking these factors into account, the 2008-2009 study was designed to gather reliable information on HIV prevalence among MSM in Southern and Eastern Europe.

2 METHODS

2.1 Study design

The study was a descriptive multi-centre biological and behavioural cross-sectional survey and was carried out in seven cities of Southern and Eastern European countries: Athens, Greece; Barcelona, Spain; Bratislava, Slovakia; Bucharest, Romania; Ljubljana, Slovenia; Prague, Czech Republic; Verona, Italy. In this report Bratislava, Bucharest, Ljubljana and Prague were defined as Eastern European cities. In Athens, the data collection could not be completed and therefore the data from Greece have not been included in this report.

The objective of the study was to estimate Ab-anti-HIV and Syphilis seroprevalence among MSM in the data collection sites through a serological survey based on saliva (oral fluid) test and to study sexual behaviour risk patterns and the determinants of VCT access in the MSM population through a survey modelling the relationship between risk behaviour, socio-ecological factors and serology.

Ethics Committee approval was obtained in each participating country and an informed consent form was collected for each respondent. The questionnaires and the oral fluid samples were collected anonymously. In order to make the test result available to interested individuals, a barcode was used to link the respondents to the test result via a card with the same barcode given to the respondents when oral fluid was collected. To comply with all ethical and legal aspects and minimize the risks of diagnostic mistakes, respondents interested in getting their test results were informed that the test result was not meant to be diagnostic and for this reason they should be tested again in line with international/ national guidelines. In case of a confirmed positive HIV test, the person was directed to the infectious disease department for further checks of the clinical situation and start with the antiretroviral treatment if needed.

Study population

Participants were recruited according to the following four inclusion criteria: having had sex (any kind of sex: oral and anal, penetrative or not) at least once with another man during the last 12 months before the study; having signed a written informed consent form; having accepted to answer the study questionnaire; having accepted to donate an oral fluid sample. Three exclusion criteria were adopted: age below 18 years; being currently active injecting drug use (IDU) and having already participated in the study.

Sampling

Time-location (or time-space) sampling (TLS) was used to recruit representative samples of men visiting the gay scene in each city. The method used was consistent with the approach adopted in previous studies [15, 18-21]. In the TLS, spaces (or locations) are venues attended by the target population; times refer to specific days and time periods when the target population congregates in each space. This method allows a sample with known properties to be identified and enables statistical inferences to be made to the larger population of venue visitors. Formative research was conducted in each collection location in order to identify the list of potential TLS units, the attendance time frame, opening days and hours of each venue. Bars, discos, saunas, cruising venues, sex-shops, sex-clubs were identified in all cities. All venues were mapped and visited when information on attendance patterns was not sufficient to prepare a TLS units list. The spaces and their associated days were divided into standardised time segments (four-hour periods). Subjects were enrolled over the entire TLS unit time period. Information on the number of refusals per TLS unit was collected. Furthermore, settings or special gay events that did not occur frequently were identified. A “special events” category was created and included in the sampling list because such occasions may attract members of the target population. The list of TLS units obtained with this process for each collection site included the primary sampling units (PSU). PSUs were randomly selected from complete list of eligible TLS list in each city. The sample size estimation for a prevalence study was calculated on the basis of previous prevalence estimation studies when available [22]. A total of 2,800 persons (400 per city) were included in the planned survey.

2.2 Data collection and analysis

Questionnaire

A self-administered pen-and-paper questionnaire was used to obtain information on the social/cultural/environmental context of respondents, access and barriers to voluntary counseling and testing (VCT), behavioural data on sex practices, risk-reducing strategies, condom use), STI history, self-reported/perceived serostatus and type of partner. A steady partner was defined in the questionnaire as “a person who you are committed to and have sex with, not meaning that you are exclusively monogamous”; casual partner as “person you have sex with, occasionally without a steady partnership”. In addition, UNGASS indicators were taken into account when designing the questionnaire [3,14].

The preliminary version of the questionnaire was piloted among MSM attending gay venues to check on the time needed to complete it and to ensure the questions were not ambiguous or confusing. The English version of the questionnaire was translated into the languages of the participating countries and then translated back into English.

A questionnaire manual and a training module were developed in order to guarantee uniform data collection. Specific training of data collectors was held in each country in a one day session by a data collection coordinator. The same coordinator was in charge of monitoring the local data collection and coaching the data collectors during the task. An ongoing evaluation process was organised through regular meetings with data collectors.

Enrolment

According to the data collection calendar, trained field workers from gay associations distributed anonymous self-complete questionnaires and Oraclor oral fluid collection kits. Both self-complete questionnaire (behavioural data) and oral fluid samples (biological data) were collected for each subject. A barcode was used to link behavioural and biological information. The enrolment period varied between cities. The data collection calendar varied from two months in Barcelona and Verona to nine months in Bratislava and Bucharest. The overall duration of data collection varied from 2 months (Barcelona) to 9 months (Bratislava), starting in November 2008 and ending in October 2009. Respondents were also be given a free pack containing a condom and a leaflet with information on the closest HIV screening and counselling centres, where people can get the test result, obtain testing and receive information on HIV/STI prevention and treatment.

Statistical analysis

As the focus of the study was descriptive, mean, median, standard deviation, quartiles and inter-quartiles were used and proportions with 95% confidence intervals (CI) were calculated for all variables and indicators. STATA 11 survey commands suite was used.

2.3 Laboratory testing

Oral Fluid sampling and testing

To collect oral fluids, OraCol oral fluid collection kits (Malvern Medical Developments, Worcester, UK) were used. The main advantages for replacing serum with oral fluid were easy access and non-invasive collection. After collection, oral fluid samples were kept refrigerated and sent to the national reference laboratory for HIV/AIDS in the respective countries no more than 72 hours after collection.

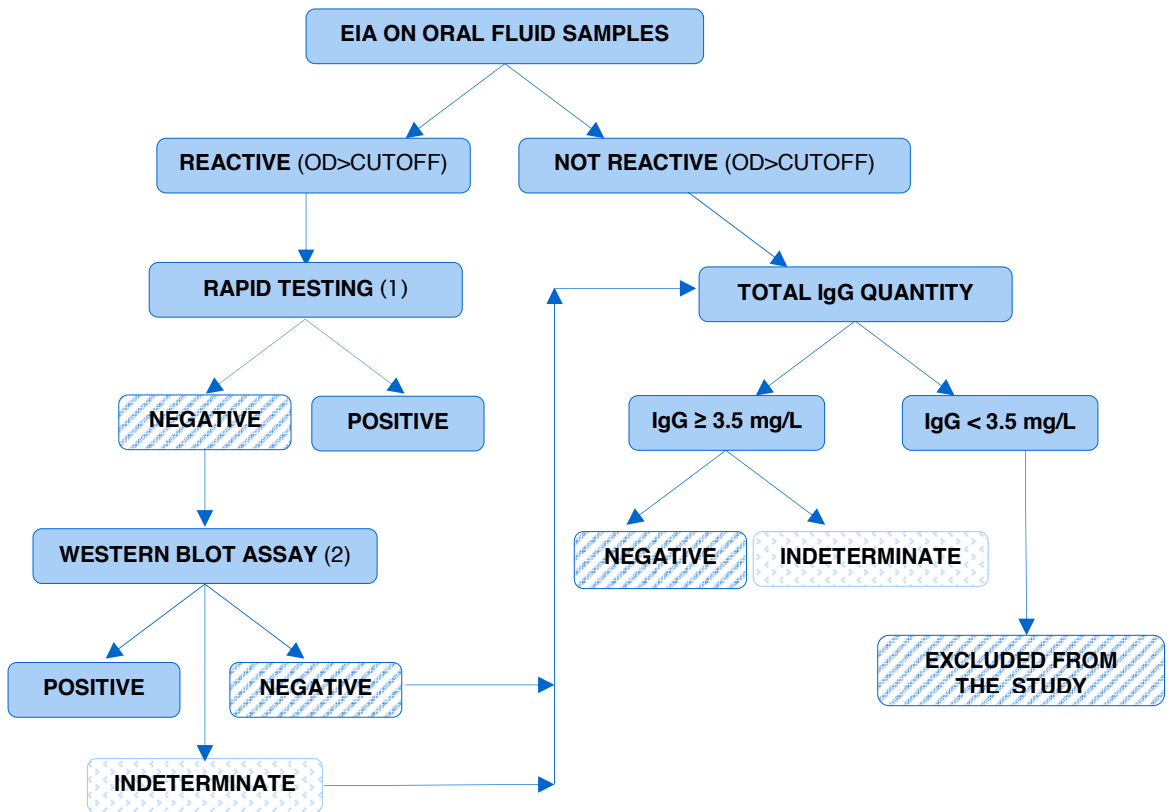
HIV testing

The oral fluid samples were sent for the analysis by each national reference laboratory to the Teaching Hospital-University of Verona, Immunology Unit, Verona, Italy. EIA testing GENSCREEN HIV 1/2 version 2, BIO-RAD on oral fluid sample was performed according to the manufacturer’s instructions [23]. All positive samples were confirmed with a Western Blot test. As quality control, for each oral fluid sample, a total IgG antibodies ELISA test was performed in order to assess the sample suitability for testing. Samples below 3.5 titre (cut-off) were excluded from the study as invalid (see Fig.1 below: Survey testing algorithm). A validation study of Bio-Rad OF testing comparing serological testing involving 37 HIV positive patients and 35 controls per country was carried out according to commission decision of 7 May 2002 on common technical specifications for in vitro medical devices. EIA on oral fluid samples from 259 of the 263 HIV positive subjects were positive, giving a sensitivity of 98.5% (CI 96.2-99.6). All 233 controls were found negative for HIV in oral fluid and no false positive was detected (100% specificity; CI 98.4-100). The positive and negative predictive values of the O.F. test according to HIV prevalence are presented in Table 1 below.

Table 1: PPV and NPV according to prevalence

PREVALENCE	5%	15%
PPV	100%	100%
NPV	99.9%	99.7%

Fig. I Survey: HIV testing algorithm on oral fluid samples



(1) we used rapid Immunocromatography Determine HIV 1/2 (Unipath Ltd, Bedford UK) CE marked for serum
 (2) we used HIV 1/2 BLOT 2.2 (MP Biomedical, Singapore, Cina) CE marked for serum

Syphilis testing

An innovative method, (Time Resolved Fluorescence Immunoassay, TRFIA [24]) has been used to detect Anti treponema IgG in oral fluid samples as traditional methods like TPPA or EIA are not sensitive enough for these purposes. TRFIA has been shown to be high sensitive and specific for detection of anti-Treponemal IgG in oral fluid specimens [25, 26]. According to the study of Baguley et al., 2005 the overall sensitivity and specificity of this oral fluid assay was 95.8% and 86.1% respectively, based on the 5th percentile of the positive results, and 93.7 and 91.1%, respectively, based on a cut-off derived by mixture model analysis. For individuals with primary syphilis the optimum sensitivity of the oral fluid assay was 87.5%, whereas in those with disease classified as secondary syphilis and early latent, the sensitivity was 100 and 94.7%.

In our validation study we challenged the assay on oral fluid samples collected from 49 syphilis seropositive patients (F=4; M=45; median age:44 ys;14 with early (primary, early latent), 35 with late latent syphilis) and 15 seronegative controls. Serum from patients was screened using a syphilis enzyme immunoassay (EIA) (Enzygnost Syphilis, Dade Behring). EIA reactive sera were further confirmed by quantitative TPPA and VDRL assay and by the method for determination of treponemal IgM status. The oral fluid was collected using the Oracol collection device (Malvern Medical Developments, Worcester, UK) and tested for the presence of antibodies against *T. pallidum* by time-resolved fluorescence immunoassay (TRFIA) as described by Baguley et al., 2005.

All controls had reactivity index below the 5 SD cut off. All samples of 14 patients with early syphilis (primary and early latent) and 27/35 samples of patients with late latent syphilis had reactivity indices above the cut off, whereas 8 samples of patients with late latent syphilis had reactivity below the cut-off. The test revealed both 100% of sensitivity and specificity and 77% sensitivity and 100% specificity by testing samples of patients with early and late latent syphilis, respectively. Testing of all oral samples from patients with positive and negative serology revealed the sensitivity and specificity of the test as 84% and 100%, respectively. At this moment TRFIA is the only oral fluid test that can detect Anti-Treponema antibodies in oral fluid and it could be useful to estimate the IgG sero-prevalence of syphilis in high risk population. Nevertheless further validation studies, recruiting higher number of subjects (with different stages of syphilis) should be carried out in order to better interpret results, as for the moment it is not possible to distinguish active syphilis from former/treated infection.

3 GENERAL DESCRIPTION OF THE STUDY SAMPLE

Numbers of subjects recruited

A total of 2,592 subjects were recruited. 408 MSM in Prague, 185 in Athens, 405 in Verona, 398 in Bucharest, 394 in Bratislava, 401 in Ljubljana and finally 401 in Barcelona. This study doesn't include the analysis of data from Athens as the Greek partner did not achieve the data collection.

Questionnaires and oral fluid samples collected

Table 1 shows the number of questionnaires and the number of oral fluid samples gathered during the data collection period, for each country. Both the number of valid and invalid questionnaires and OF samples are given. From a general point of view, the percentage of invalid questionnaires is low, with the highest rate in Ljubljana (0.7%); in three cases the rate is 0% (Athens, Bucharest and Bratislava).

Table 1: Number of questionnaires and OF samples collected and percentage of valid samples

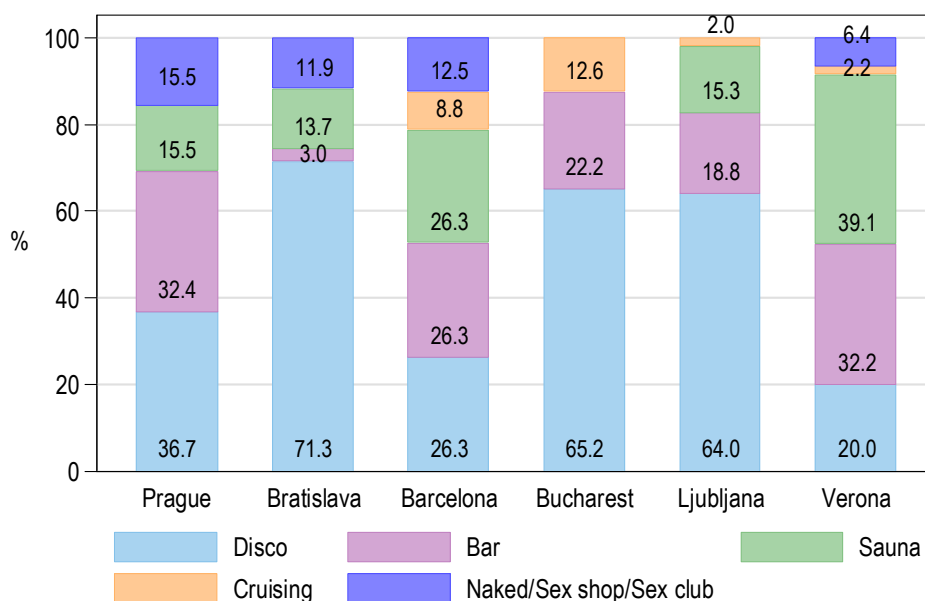
	Prague	Athens	Verona	Bucharest	Bratislava	Ljubljana	Barcelona
Questionnaires	408	185	405	398	394	401	401
Valid	407	185	404	398	394	398	400
% invalid	0.2	0.0	0.2	0.0	0.0	0.7	0.2
OF samples	418	178	400	398	396	399	399
Invalid	31	28	9	53	10	10	10
% invalid	7.4	15.7	2.3	13.3	2.5	2.5	2.5

With regards to the OF samples, in two cities the percentage of invalid samples is higher than 10% (Athens 15.7%; Bucharest 13.3%), in the other cities the percentage is low, ranging from 2.3% (Verona) to 2.5% (Ljubljana, Barcelona and Bratislava).

Venue types

The proportion of subjects recruited by venue type is shown in Fig.1 47.1% of the respondents were recruited in a disco (1,128 MSM). Except for Verona, discos were the main location where questionnaires and oral fluid were collected: 36.7% in Prague, 71.3% in Bratislava, 65.2% in Bucharest, whilst the percentage in Ljubljana was 64.0%. Bars represented the second location in each city, in terms of number of participants (22.6% of the total, 540 subjects): the percentage of subjects recruited in this location ranged from the 3.0% in Bratislava to 32.2% in Verona. With regard to saunas, 39.1% of the sample was recruited in this setting in Verona, 26.3% in Barcelona, about 15% in Prague and Ljubljana and 13.7% in Bratislava; in Bucharest there is no sauna. Taking into account the total of the sample, the percentage of MSM recruited in sauna was 18.4%. Low percentages of participants were recruited in cruising settings. Naked sex party and sex clubs were not present in Bucharest and Ljubljana, and the percentages of MSM recruited in this type of venue ranged from 6.4% in Verona up to 15.5% in Prague.

Fig.1: Subjects recruited by venue type



Refusals (by venue type, by country)

A specific form was developed in order to record the number of refusals during data collection. During every data collection session, the refusal form was filled in and this allowed the number of refusals to be linked to the specific Venue-Day-Time unit, and to the individual data collector. The refusal rate was calculated by dividing the number of refusals by the number of persons contacted to participate in the survey.

As shown in Table 2, the highest rates of refusal were reported in sex clubs, naked parties, cruising areas and saunas, while low levels were found in bars and discos. This was probably due to the fact that in the sexually explicit people were more reluctant to talk to data collectors for obvious reasons.

Table 2: Refusals by type of venue

Venue	Done	Refusals	Refusal rate
disco	854	623	0.73
bar	453	328	0.72
sauna	422	499	1.18
cruising	50	62	1.24
naked	76	104	1.37
sex club	112	149	1.33

The use of TLS as a sampling method proved to be feasible and efficient in cities with highly developed gay scenes as well as in cities with less developed scenes. As previous studies among MSM have shown, TLS increases the possibility of involving a variety of participants, producing more valid results [15]. A generalization of the estimates obtained with this method to the wider population of MSM attending sampled venues is also possible. TLS can be adopted on a larger scale and the method is easily applicable in cities with a considerable number of eligible gay venues. It is more difficult to implement in cities where the gay community is poorly organized and where there are few specific and easily accessible venues (as in Bucharest). Few venues means that the venues available are visited too often by data collectors, thus reducing the acceptance of the data collection process both by owners of venues and attendees. This aspect may impact on the representativeness of the MSM sample of the whole MSM population and therefore reduce the efficiency of TLS.

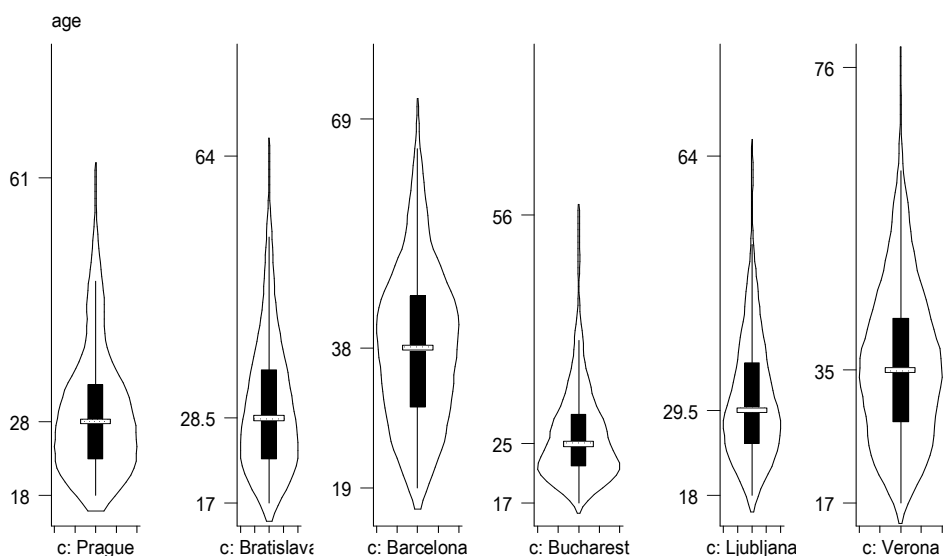
4 SOCIAL DEMOGRAPHIC DATA

4.1 Study population

Age

Median age and age distribution by city are presented in Fig.2. Respondents in Barcelona and Verona had a similar age distribution and were older (38 and 35 years respectively) than those in Eastern European cities; in Bucharest the median age of respondents was 25, in Bratislava it was 28.5, in Prague 28 and in Ljubljana the median age it was 29.5 years of age. It should be pointed out that the heterogeneous nature of the gay scenes in the different cities may mean that the subjects recruited in those cities have different characteristics, for example a lower median age for subjects recruited in discos which are popular among the young.

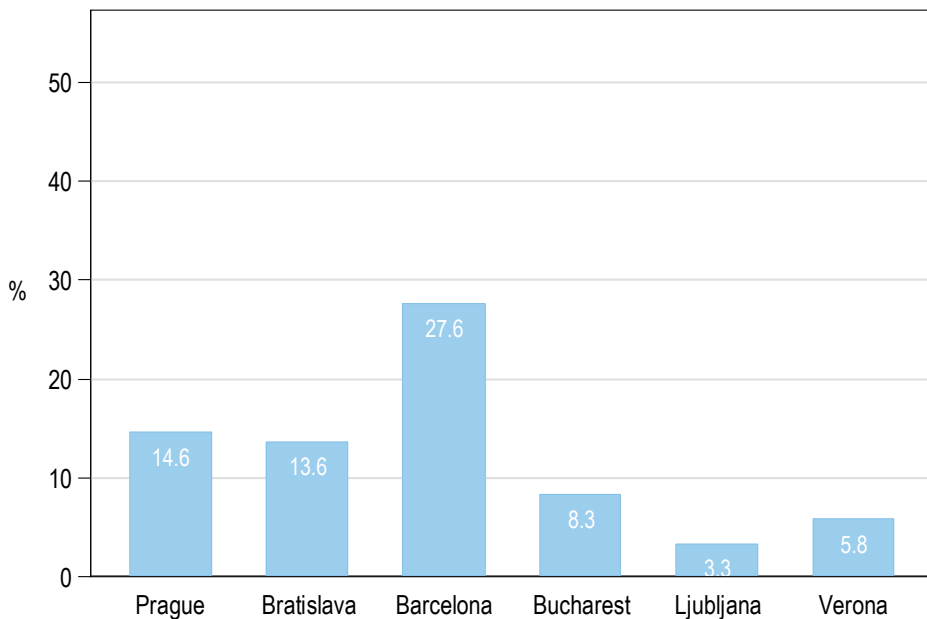
Fig.2: Age distribution of MSM recruited by city



MSM of different nationalities

The gay scene is characterized by many factors, and one very important one is the nationality of venue attendees. The data are shown in Fig.3 below. It is not surprising that there was a high percentage of foreigners in Barcelona (27.6%), since this city has a large latin-american community and an active gay tourist industry. In Prague and Bratislava the percentages of foreigners was about 14%, mainly from Slovakia and Germany in the first case and from the Czech Republic and Hungary in the second. In the other cities percentages varied between 3.3% and 8.3%.

Fig. 3 : Foreigners in each city



Education and employment

In relation to the level of education, the majority of the sample had a secondary school diploma (53.3%), while 38.7% had a university degree and only 8.0% a primary school diploma. MSM in Barcelona had the highest proportion of degrees (53.6%) and MSM in Prague the lowest (27.4%), while MSM in Bucharest had the highest proportion of primary school diplomas (11.4%) and MSM in Bratislava the lowest (3.6%). These results should be interpreted very carefully as the age distribution of respondents varied considerably from country to country as shown in Fig.2 above, and therefore the education level may be different because of age and not social/economical conditions. This was confirmed by a logistic regression¹. The same caution should be used when interpreting data on employment. The majority of respondents was employed (77.6%), while 15.4% were students and only 7.0% unemployed (including retirees). The highest percentage of employed people was in Barcelona (85.9%) and the lowest in Ljubljana (69.2%), while the reverse was true of students (22.4% in Ljubljana and 4.7% in Barcelona).

Living conditions

In most of the cities the largest group of respondents lived alone: 41.8% in Prague, 40.8% in Verona, 37.4% in Barcelona and 36.9% in Ljubljana. Exceptions were Bucharest and Bratislava, where respondents lived mostly with their parents (34.1% in Bucharest) or with their male partner (29.1% in Bratislava), followed in both cases by those living alone. Also in Verona, a high proportion of MSM lived with their parents (30.1%), although a larger number lived alone. Barcelona had the highest proportion of respondents living with friends (22.9%), while the highest proportion living with male partners was in Prague (27.5%) and Bratislava (29.1%) followed by Ljubljana (23.4%). The percentage of respondents living with a heterosexual family (female partner and/or offspring) was generally lower than 8%, ranging from 4.6% in Bratislava to 7.7% in Verona.

In almost all cities the majority of respondents lived in areas with more than 100,000 inhabitants, ranging from 64.2% in Bratislava to 82.9% in Bucharest, with the sole exception of Verona, where the majority of respondents lived in a city with less than 100,000 inhabitants (58.1%) and therefore came from rural areas or small villages.

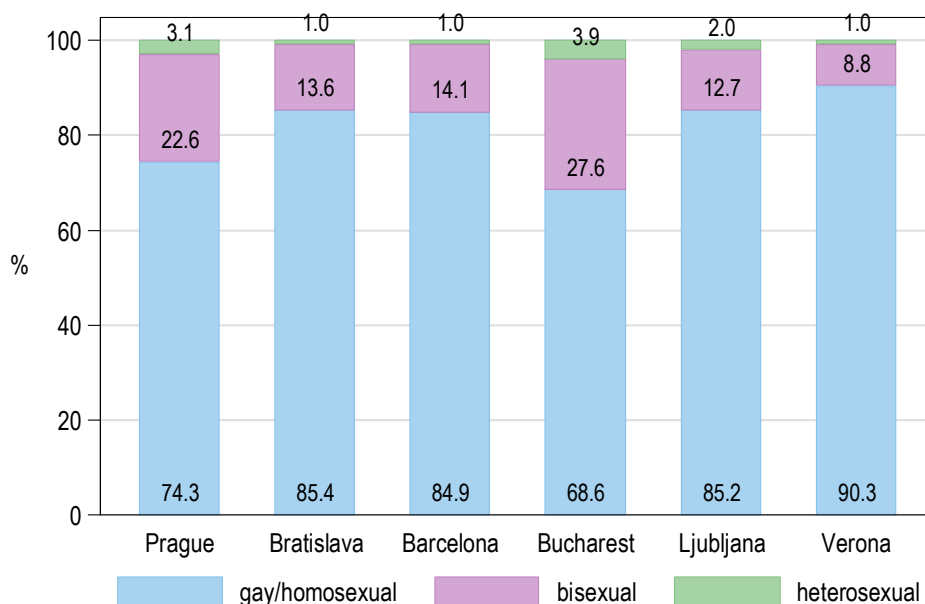
¹ OR 5.8; $p < 0.001$

4.2 Sexual orientation and social contexts

Self-identified sexual orientation

More than 80% of the respondents self-identified themselves as homosexual in Barcelona, Bratislava, Ljubljana and Verona (see Fig. 4). The highest proportion of bisexuals and heterosexuals was found in Bucharest (27.6% and 3.9% respectively) and the lowest was in Verona (8.8% and 1.0% respectively). From logistic analysis, it was shown that in Bucharest sexual orientation and age are associated: the young² are more likely to self define themselves as bisexuals or heterosexuals. This could be due to a transitional definitional strategy in the process of homosexual identity formation or to an emerging contemporary refusal of the existing dichotomic labelling of sexual orientation [27-29]. However, the data from the other cities are inconclusive in this regard, and a discussion of the complexity of self definition in the process of constructing a sexual identity exceeds the purpose of this report.

Fig. 4: Self identified sexual orientation by city

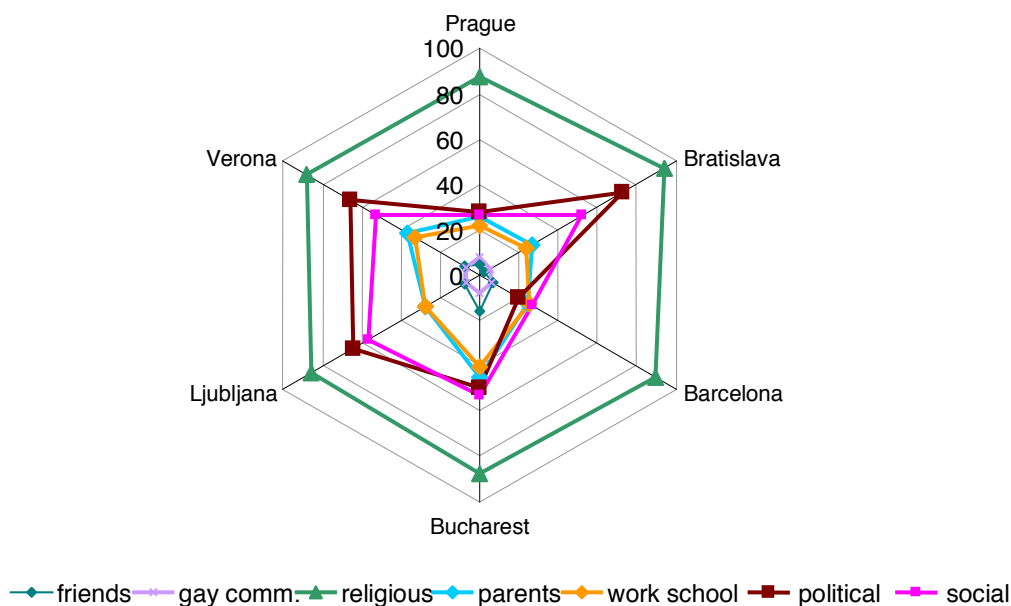


² OR: 0.59 ; $p < 0.05$

Perceived contextual attitudes and homonegativity

Respondents were asked people's attitude towards homosexuals and bisexuals in different contexts, according to their experience. If we take into consideration only perceived homonegativity (negative or very negative attitudes), 88.5% said that the world of religion has a negative attitude towards homosexuals and bisexuals while 50.1% attributed this negativity to the political world. As shown in Fig.5 below, stigmatisation in general social contexts was experienced by 44.7%. Only in Barcelona and Prague were figures lower than 30% in social and political contexts, while in the other cities they ranged from 49.7% (Bucharest) to 72.6% (Bratislava). The lowest stigmatisation levels were found in relation to the gay community and from friend's circles, 6.7% and 7.4% respectively. Almost 30% of respondents perceived negative attitudes in work/school contexts (28.6%) or with parents (31.0%). With regard to these, MSM in Verona and Bucharest had the most negative perceptions, 33.1% and 40.6% respectively in relation to work/school, and 37.1% and 45.2% respectively in relation to parents.

Fig.5 : Perceived homonegativity in different contexts by city



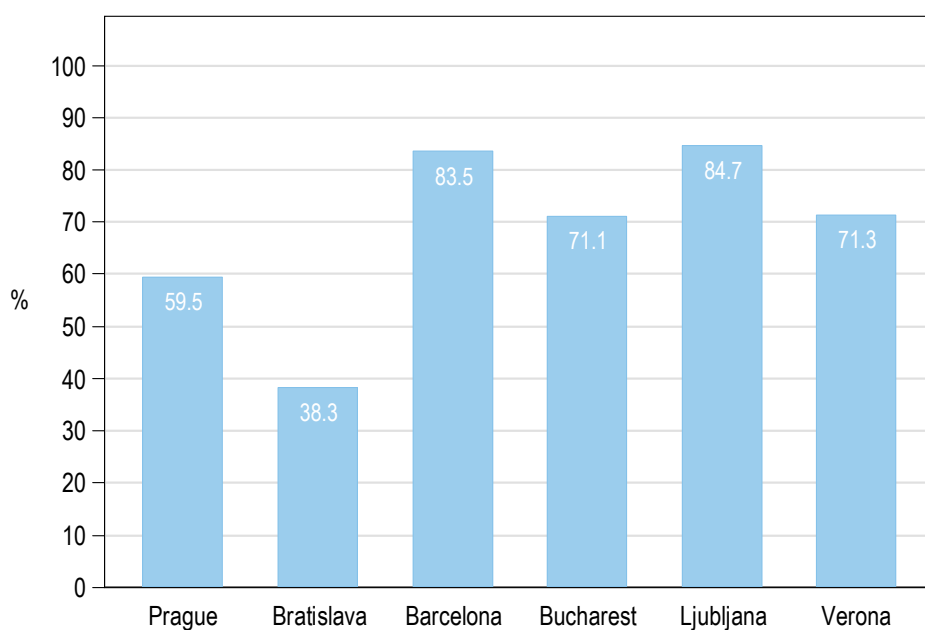
5 HEALTH/STI RELATED DATA

5.1 Access to prevention

UNGASS indicator N. 9

This indicator represents the percentage of most-at-risk populations (here MSM) reached with HIV prevention programmes, where the numerator is the number of respondents who replied that they have been given condoms for free in the last 12 months **and** knew where to go if they wished to be given an HIV test. As shown in Fig.5, the highest percentages of people reached by prevention programmes was in Ljubljana (84.7%) and Barcelona (83.5%) and the lowest in Prague (59.5%) and Bratislava (38.3%). According to this indicator, young people (< 25 yo) were less reached by prevention programmes than older people (61.4% vs 72.0%)³. At the city level, less access to prevention programmes by young people was true only in Ljubljana and Verona.

Fig. 5: UNGASS indicator N. 9: MSM reached by prevention programmes



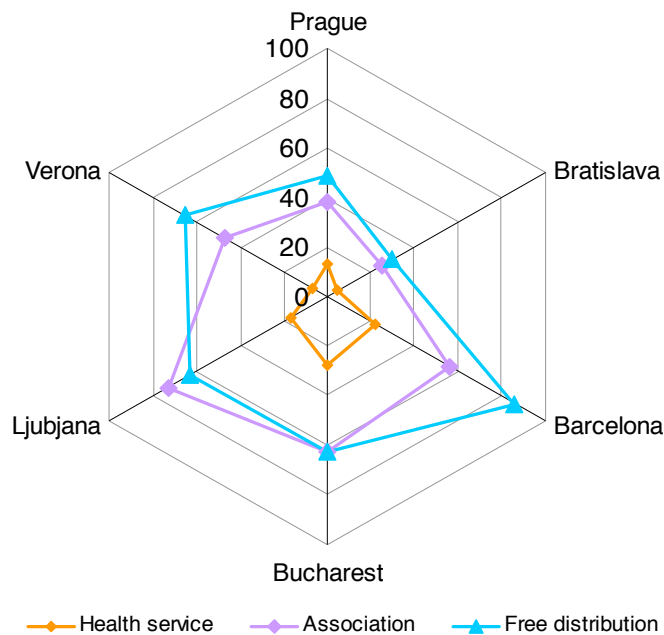
³ P<0.001

Condom distribution over the last 12 months

One of the UNGASS parameters is the free distribution of condoms. In this case, almost 3/4 (73.7%) of respondents had been given condoms for free in the last 12 months, 58.9% from distribution in gay venues (disco, sauna, etc), 50.3% by an association (gay or NGO) and 14.5% by health services.

As shown in Fig.6, the city where the free distribution of condoms in gay venues reached the highest percentage of MSM was Barcelona with over 85%. In general this was the most common method reported by respondents. Distribution by NGOs, on the other hand, was less efficient than in gay venues except in Ljubljana, where almost 3/4 of subjects received condoms from the local gay association, and in Bucharest, where the distribution in gay venues or by associations was similar (almost 62%). The least effective method of distribution in all cities was by healthcare services which failed to reach even 30% in Bucharest, the city with the highest percentage for this type of distribution. Bratislava was the worst city for the distribution of condoms, whatever method was used: less than 5% from healthcare services, less than 30% in gay venues or from gay associations.

Fig. 6 : Condom distribution by city



Young people seem to be at higher risk due to their their more limited access to HIV screening services and prevention programmes.

The role of gay venues and associations is vital for reaching target MSM for the distribution of condoms.

Efforts must be made to improve access to prevention and condoms, particularly in Slovakia and Czech Republic.

5.2 Access to HIV tests and HIV prevalence

Knowledge of VCT facilities

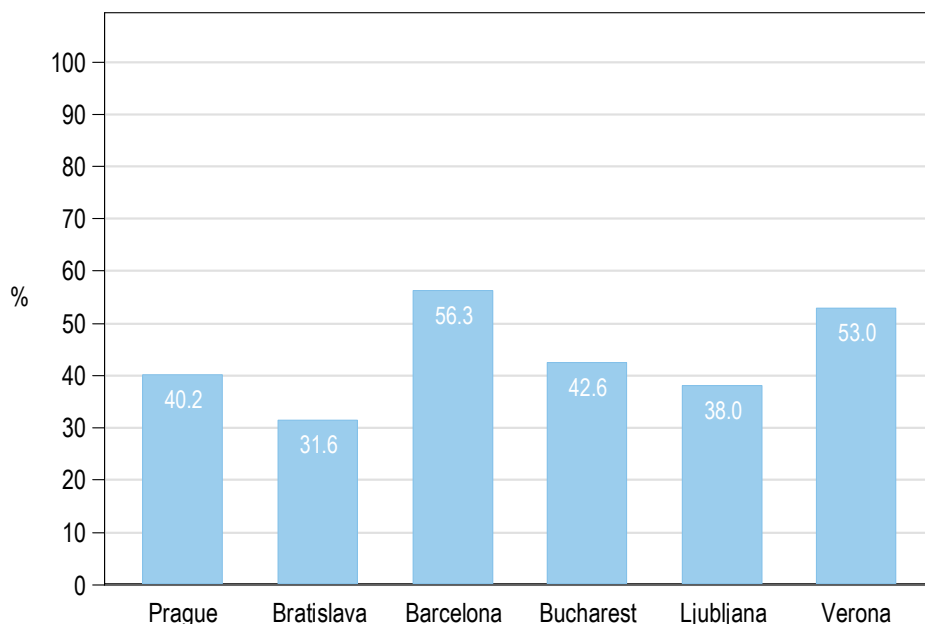
92.7% of respondents from the overall sample knew where to go to have an HIV test. 97.2% of respondents knew where to go in Ljubljana and 86.9% Bucharest (the highest and the lowest percentages).

HIV testing in the last 12 months

Almost half of respondents (49.9%) on the overall sample had been tested in the last 12 months. In order to monitor HIV testing uptake, UNGASS indicator number eight was used. This indicator comprises the percentage of MSM tested for HIV over the last 12 months who also collected the result. Fig.7 presents the UNGASS 8 indicator estimate by city. Southern European cities had the highest percentage of tested people who received their HIV test result (56.3% in Barcelona and 53.0% in Verona), while the Eastern European cities had the lowest percentages, ranging from 31.6% in Bratislava to 42.6% in Bucharest. This indicator was **higher for people of ≥ 25 years of age (46.5%) than for people younger than 25 (38.4%)⁴**, showing that young people tend to be tested less although this is not confirmed when processing data for individual cities.

⁴ $P < 0.001$

Fig. 7: UNGASS indicator N. 8: MSM who were tested in the last 12 month and knew the result

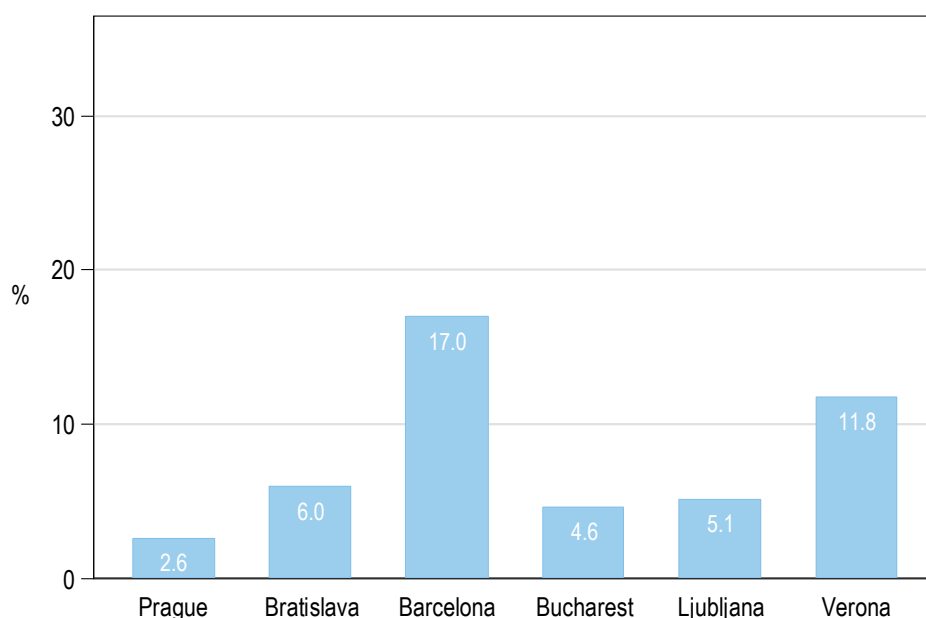


Among the respondents who had had an HIV test over the last 12 months, the percentage of subjects who decided to get the test result was over 90% in all countries. The percentage ranged from 94.4% in Ljubljana to 98.3% in Barcelona.

UNGASS indicator N.23: number of MSM who are HIV positive

Fig.8 presents the prevalence of HIV infection among MSM based on the oral fluid tests. The cities with the highest HIV prevalence were Barcelona (17.0%) and Verona (11.8%); lower percentages were reported in Bratislava (6.0%), Bucharest (4.6%) and Ljubljana (5.1%). Prague had the lowest HIV prevalence (2.6%). The overall prevalence of HIV positive oral fluid samples was 7.9%.

Fig. 8: HIV prevalence – UNGASS indicator N.23



Previous studies carried out in some of the cities participating in this study, came to different prevalence estimates. In Barcelona HIV prevalence found in previous studies carried out in MSM venues (using a convenience sample) was slightly higher than the prevalence found in this study [30,31]. The lower figures found in Ljubljana and Bratislava in previous studies may be partly related to the different sampling method and lower number of samples collected [32,33].

Prevalence by age

The prevalence according to age group is represented in Table 3. In the overall sample, prevalence of HIV among young people (less than 25 years old) was significantly⁵ lower than among people of over 25 years of age (3.5% vs 9.6%). This difference in prevalence according to age group was also significant⁶ in Ljubljana where no HIV+ cases were found among younger MSM, and in Bratislava where 1.7% of younger MSM were HIV positive compared to 7.6% of older ones⁷.

⁵ $P < 0.001$

⁶ $P < 0.05$

⁷ $P < 0.05$

Table 3: HIV result according to age group

Age group	Negative		Positive		Total	
	No.	%	No.	%	No.	%
< 25	553	96.5	20	3.5	573	100.0
≥ 25	1447	90.4	154	9.6	1601	100.0
Total	2000	92.0	174	8.0	2174	100.0

The mean age of HIV positive MSM was 36, significantly higher than the mean for HIV negative people (31.6 years).⁸ Table 4 shows the mean age of HIV + people by country: this figure was the lowest in Bucharest (27.1 years old) and the highest in Verona (38.9 years old).

Table 4: mean of age of HIV positive people by country

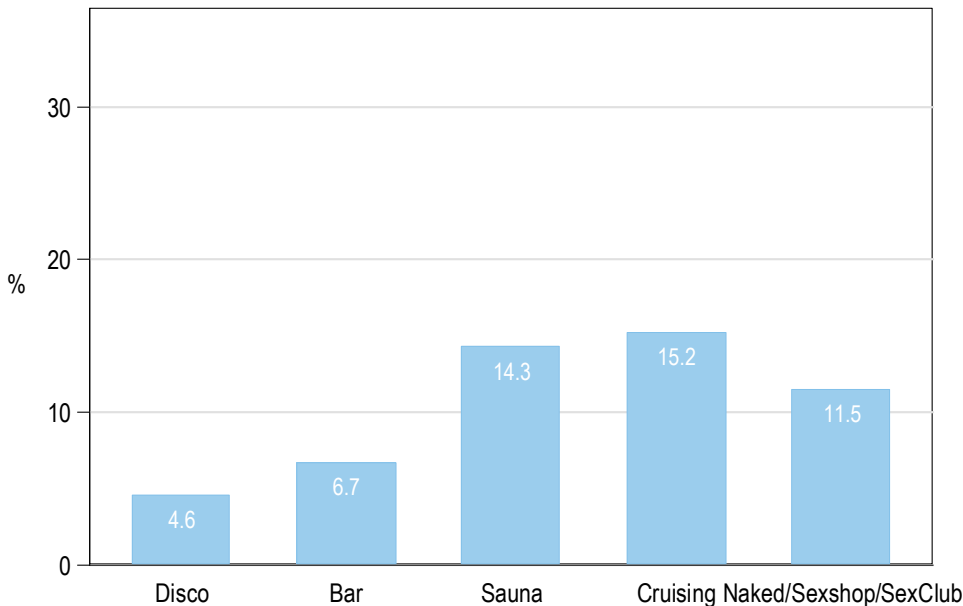
Country	Mean	95% Conf. Interval	
Prague	32.3	28.2	36.3
Bratislava	34.8	30.9	38.8
Barcelona	37.5	35.1	39.8
Bucharest	27.1	23.5	30.8
Ljubljana	35.1	32.2	38.0
Verona	38.9	36.3	41.5
Total	36.0	34.7	37.4

⁸ Two-sample Wilcoxon rank-sum (Mann-Whitney) test $p < 0.001$

HIV Prevalence by venue type

As shown in Fig.9, HIV prevalence, based on oral fluid samples, was higher in sex-focused venues like saunas (14.3%), cruising venues (15.2%) sex shops and naked parties (11.5%) than in other venues such as discos and bars (4.6% and 6.7% respectively)⁹.

Fig. 9: HIV Prevalence by venue type



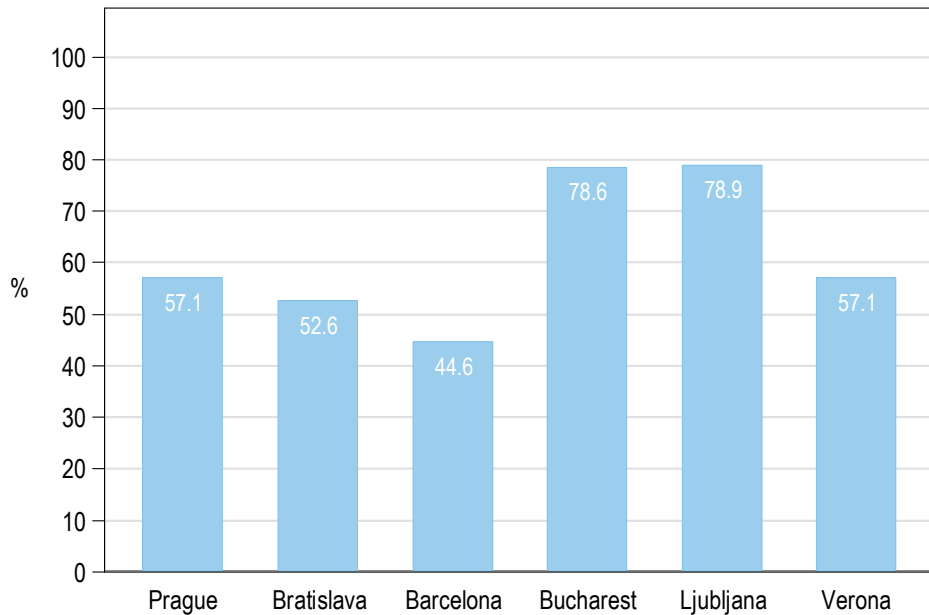
At city level, HIV prevalence by type of venue (sex focused versus non sex focused) was significantly higher in sex focused venues in Verona¹⁰, Bratislava¹¹ and Ljubljana¹².

Knowledge of actual HIV status and undiagnosed infection

56% of HIV positive people were not aware of their HIV serostatus, that is, they declared they had never been tested (7.8%), were found HIV negative at their last HIV test (47.6%) or didn't collect their result (0.6%). As shown in Fig. 10, the rates of people unaware of their HIV positive status were almost 80% in Bucharest and Ljubljana and lower than 50% only in Barcelona.

⁹ P<0.001
¹⁰ P<0.001
¹¹ P<0.05
¹² P<0.01

Fig. 10: Percentage of HIV positive MSM unaware of their HIV status



Moreover, the average age of people unaware of their HIV positive status was 33.9 y/o lower than that of subjects that knew their seropositivity that was 37.9 y/o, based on their reported last HIV test¹³.

Another important fact is that among oral fluid HIV positive subjects, nearly one third (30.9%) reported a negative HIV test **over the last 12 months**. This data seems to indicate that quite a number of infections were acquired over the last 12 months. At city level (see Table 5 below) this percentage was higher than 50% in Ljubljana while the lowest figure was in Bratislava (less than 20%). All other cities had intermediate values (nearly 30%).

¹³ Two-sample Wilcoxon rank-sum (Mann-Whitney) test $p < 0.01$

Table 5: Recently infected cases (who reported a negative test result over the last 12 months) among oral fluid HIV+ MSM

	Prague	Bratislava	Barcelona	Bucharest	Ljubljana	Verona	Total
No.	3	4	18	5	11	15	56
%	30.0	17.4	27.3	31.2	55.0	32.6	30.9
Total	10	23	66	16	20	46	181

Access to testing was less frequent in Eastern European cities (Prague, Bratislava, Bucharest and Ljubljana) and among the young.

HIV prevalence was higher in Southern European cities (Barcelona and Verona) than elsewhere.

HIV prevalence was higher among MSM of over 25 years of age and in sex focused venues.

Over half infections had never been diagnosed: this proportion was dramatic in Ljubljana and Bucharest, nearly 80%.

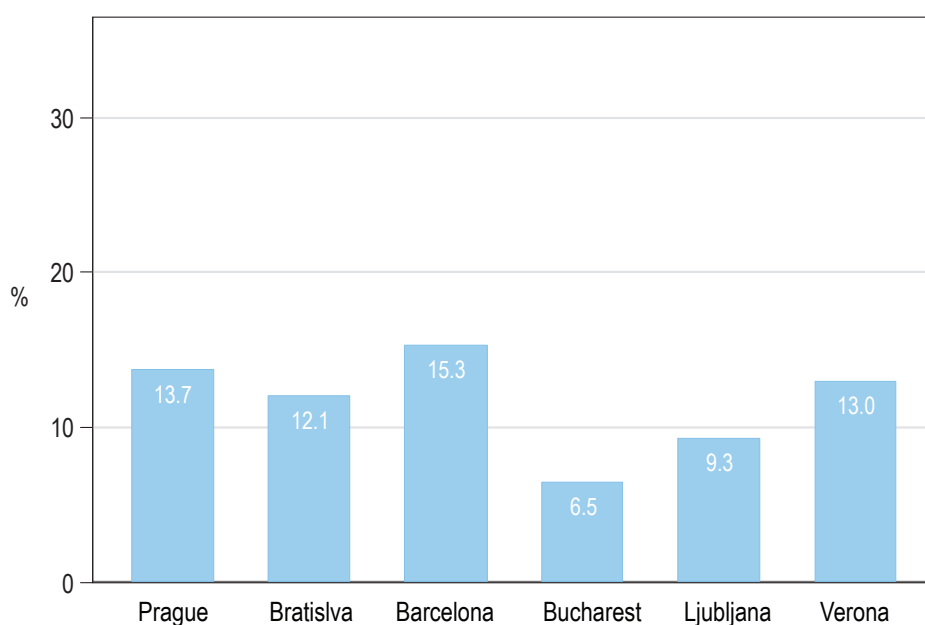
Ljubljana had the highest percentage of recent infections, taking into account HIV+ MSM reporting a negative test result over the last 12 months.

5.3 Sexually transmitted infections

STI history

Of the overall sample, 11.7% of respondents declared that they had at least one STI during the last 12 months. The highest proportion of people with a declared STI history was in Barcelona (15.3%) and the lowest in Bucharest (6.5%). See Fig.11 below.

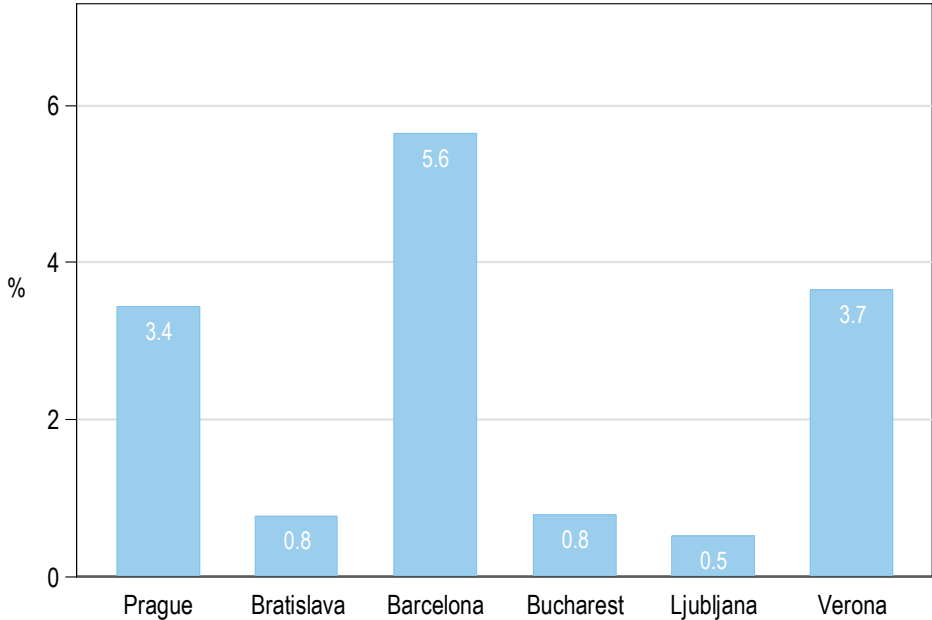
Fig. 11: STI during the last 12 months



Self reported history of syphilis

2.5% of the overall sample had had syphilis during the last year. The highest percentage was in Barcelona (5.6%) followed by Verona and Prague (3.7% and 3.4% respectively) while Bratislava, Bucharest and Ljubljana had the lowest figures (less than 1%).

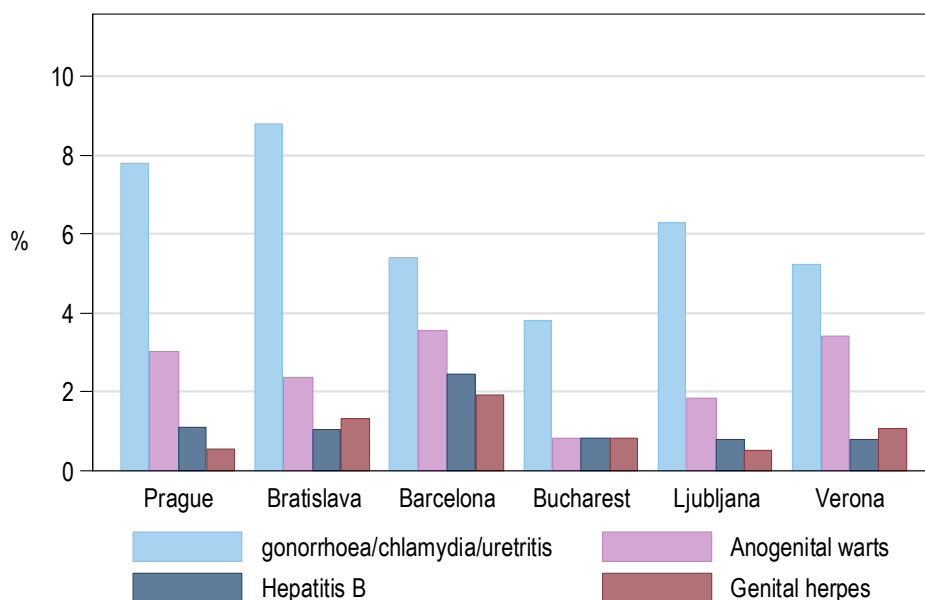
Fig. 12: Syphilis during the last 12 months



Other STIs

The most frequent STI was urethritis (6.2% including gonorrhoea and chlamydia), followed by anogenital warts (2.5%), hepatitis B (1.2%) and genital herpes (1.0%). The distribution by city is shown in Fig.13 below. The urethritis category, including gonorrhoea and chlamydia, appears to be the most frequent in all cities. The second most frequent STI was anogenital warts in all the cities.

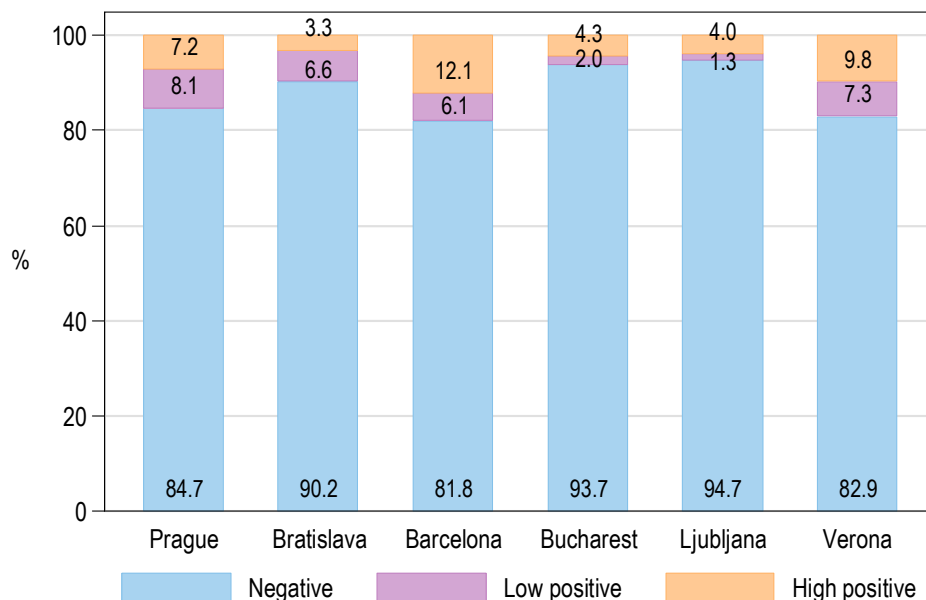
Fig. 13: Other STIs during the last 12 months by city



Anti-treponema igg seroprevalence

The results of oral fluid sample analysis using TRFIA gave prevalence of Anti-Treponema IgG in oral fluid samples as shown in Fig.14 below. Low positive samples were defined as oral fluid sample with a OD/Cut-off ratio higher than 1 and ≤ 2 . High positive samples corresponded to a ratio higher than 2. The highest global seroprevalence was in Barcelona and Verona (18.2% and 17.1% respectively), In Prague this figure was 15.3%, while lower values were found in Bratislava, Bucharest and Ljubljana (9.9%, 6.3% and 5.3%).

Fig.14: Syphilis IgG Anti-Treponema seroprevalence



Coinfections

As shown in Table 6, 16.2% of people who had had an STI in the last 12 months were also HIV positive compared to 6.6% of people who hadn't¹⁴.

Table 6: History of STI in HIV positive MSM

		HIV result		
STI		Negative	Positive	Total
No	No.	1798	127	1925
	%	93.4	6.6	100.0
Yes	No.	222	43	265
	%	83.8	16.2	100.0

¹⁴ P<0.001

As far as syphilis is concerned , the proportion of HIV positive people among those who had had syphilis in the last 12 months was 22.2% versus 7.2% among people who hadn't¹⁵. (see Table 7)

Table 7: History of syphilis in HIV positive MSM

Syphilis in the last 12 months		HIV result		Total
		Negative	Positive	
No	No.	1800	139	1939
	%	92.8	7.2	100.0
Yes	No.	42	12	54
	%	77.8	22.2	100.0
Don't know	No.	144	15	159
	%	90.6	9.4	100.0

Similarly 27.1 % of HIV positive oral fluid samples were also positive for syphilis, compared to 11.2% of HIV negative samples.¹⁶

¹⁵ P<0.001

¹⁶ P<0.001

Table 8: Syphilis and HIV sero-prevalence

Syphilis sero prevalence		HIV result		Total
		Negative	Positive	
Negative	No.	1869	132	2001
	%	88.8	72.9	87.6
Positive	No.	235	49	284
	%	11.2	27.1	12.4

Data for syphilis and HIV seroprevalence have some similarities: the highest values were recorded for both in the same cities (Verona and Barcelona), and the lowest were in Eastern European cities (Bucharest, Ljubljana and Bratislava).

A correlation exists between STI in general, previous syphilis, IgG anti-Treponema seroprevalence and HIV infection.

The higher prevalence of anti-HIV and anti-Treponema antibodies in Verona and Barcelona can partly be attributed to the higher age of the subjects and more lengthy exposure to risk.

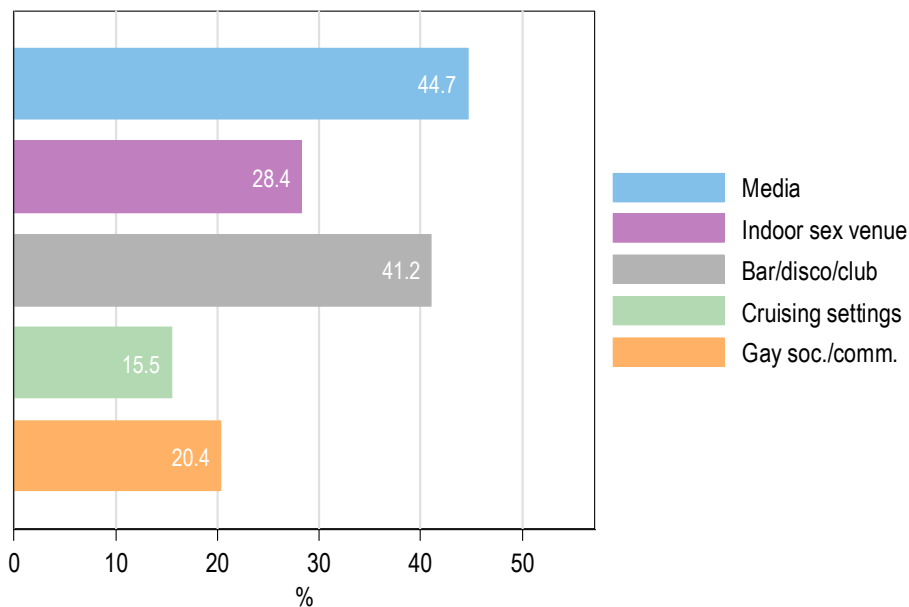
The absolute need for prevention and information programmes for STI is clear, since the presence of an STI increases the risk of HIV infection. Moreover, coinfection is a serious problem for HIV positive people.

6 SEXUAL BEHAVIOUR

6.1 Ways of finding partners in the last 6 months

As shown in Fig.15, the most frequent way of finding a sexual partner is the use of media such as internet chat rooms or newspaper advertising (used by almost half of respondents) and by encounters in bars or discos (41.2%). Indoor sex venues like saunas and darkrooms were cited by 28.4% of MSM whilst the gay community was used by 20.4% and cruising settings (parks, toilets, outdoor settings) by 15.5%.

Fig. 15: Ways of finding partners in the last 6 months



6.2 Numbers of partners

The highest average number of steady male partners over the last six months reported by respondents was in Bucharest (3.1) and the lowest in Barcelona (1.6), although the

medians show a more similar distribution between the cities, with two partners in Bucharest and one partner elsewhere (Table 9). The younger sample in Bucharest could partly explain the difference. For occasional partners, the highest mean and median were reported in Barcelona (mean 15.1, median 10), followed by Verona (mean 11.4, median 6) and Eastern European cities (mean ranging from 5.3 to 7.5 and median from 3 to 4). The average number of female partners ranged from 2.3 in Verona to 3.7 in Barcelona; the median was 1 in Ljubljana and Verona and 2 in the other cities.

Table 9: Number of partners last six months

	Male Steady		Male Occasional		Women	
Country	Mean	Median	Mean	Median	Mean	Median
Prague	2.5	1	7.5	4	2.5	2
Bratislava	2.0	1	5.9	3	3.4	2
Barcelona	1.6	1	15.1	10	3.7	2
Bucharest	3.1	2	7.1	3	3.0	2
Ljubljana	2.1	1	5.3	3	2.4	1
Verona	2.5	1	11.4	6	2.3	1

6.3 Paid sex in the last 6 months

Of the overall sample, 4.3% of subjects declared they had paid for sex. The percentages of MSM who paid ranged from 1.4% in Ljubljana to 7.2% in Barcelona. Similar levels were reported in Prague and Bratislava (5.5% and 5.2% respectively), whilst in Bucharest the percentage was 3.6% and in Verona it was 2.9%. This kind of behaviour is not related to HIV+ status.

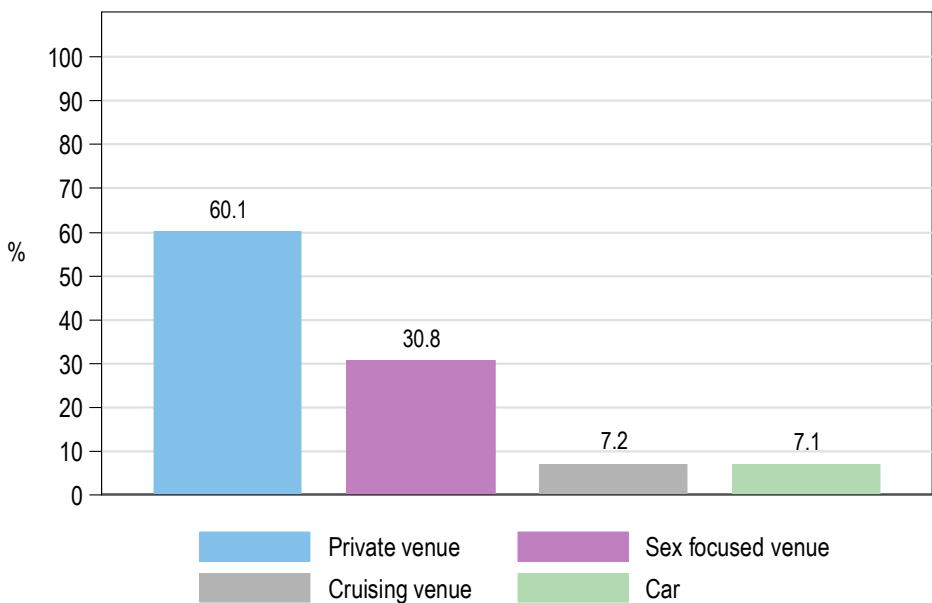
In relation to people who had been paid for sex, the percentage varies significantly between cities. The highest levels of this behaviour were reported in Bucharest (13.3%) and in Prague (8.8%), whilst low levels were found in Bratislava (5.0%), Barcelona (5.9%) and Verona (4.6%). The lowest percentage was in Ljubljana (1.4%). Considering the

overall sample, the percentage of people who had been paid for sex reaches the 6.4%. Payment for sex is not related to serum-status.

6.4 Setting of last sexual encounter

The setting of the last sexual encounter (with occasional partner) is shown in Fig.16 below. Private settings (including hotel, private flat) were mentioned by more than 60% of respondents, sex-focused venues such as saunas and dark rooms, by more than 30% . Cruising settings and "car" were mentioned by respectively 7.2% and 7.1% of MSM.

Fig.16: Setting during last sexual encounter with occasional partner

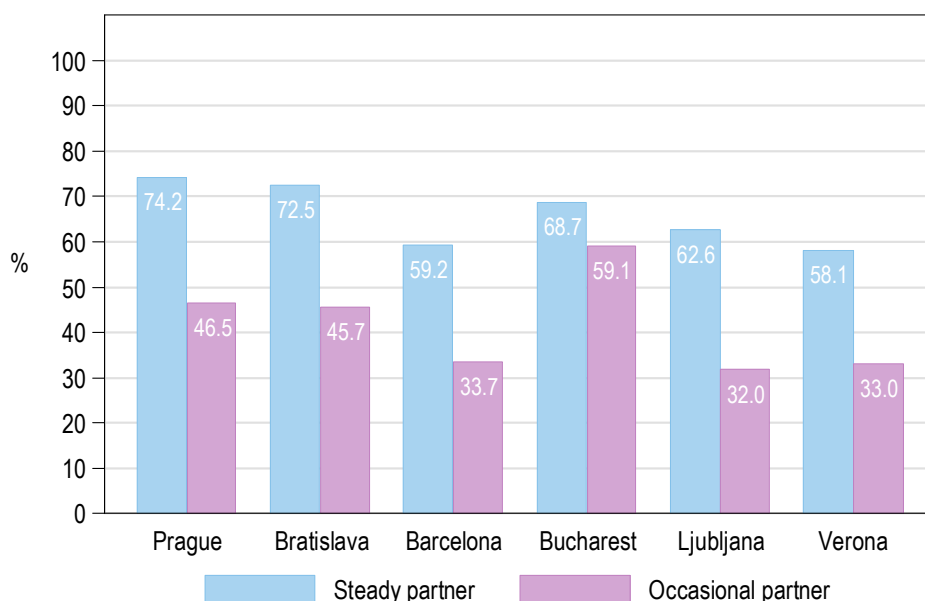


6.5 Unprotected anal intercourse (UAI)

Unprotected anal intercourse over the last 6 months¹⁷ with steady and casual partner

As known in fig. 17, the percentage MSM who reported unprotected anal intercourse **over the last 6 months** with their **steady partner** was highest in Prague (74.2%) and Bratislava (72.5%) and lowest in Verona (58.1%). UAI with an **occasional partner** was most frequent in Bucharest (almost 60%), then Prague (46.5%) and Bratislava (45.7%), and 1/3 of respondents reporting UAI in the three remaining cities.

Fig.17: UAI over the last 6 months with steady and occasional partners



The percentage of MSM reporting UAI was significantly higher among young people (< 25 years of age) with a steady¹⁸ (70.8%) and occasional (51.2%)¹⁹ partner compared to older people (64.9 % and 37.8% respectively).

¹⁷ This variable was constructed taking into account respondents who answered they had UAI "sometimes" or "often" in the last six months.

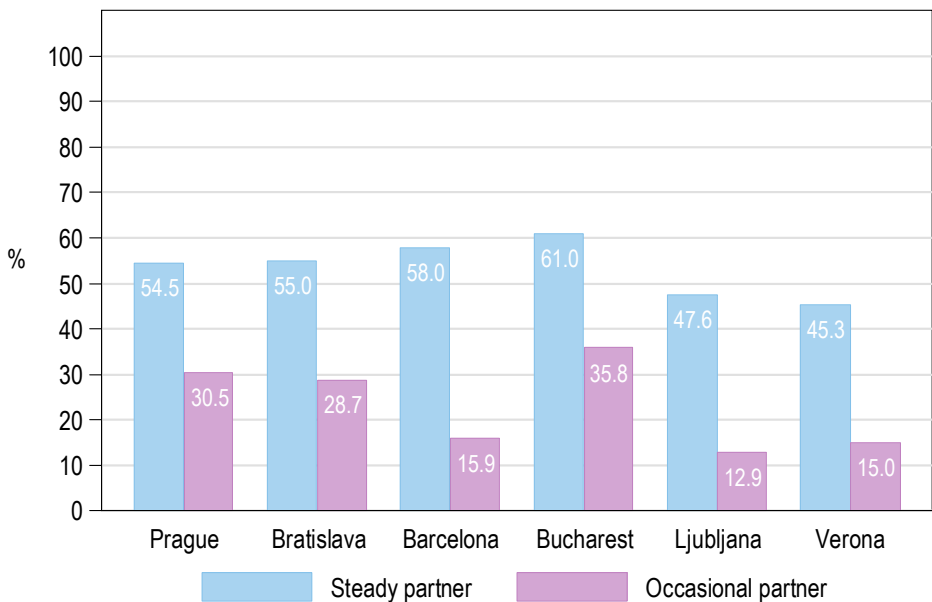
¹⁸ $P < 0.05$

¹⁹ $P < 0.001$

Unprotected anal intercourse last time with steady and occasional partners

The percentage of MSM who reported that they had had unprotected anal intercourse the **last time they had sex** is shown below (Fig.18). For anal sex with an **occasional partner**, Bucharest, Prague and Bratislava had higher percentages (35.8%, 30.5% and 28.7% respectively) than Barcelona, Verona and Ljubljana (15.9%, 15.0% and 12.9% respectively). The percentages of subjects reporting UAI with a **steady partner** were higher in all cities, ranging from 45.3% in Verona to 61.0% in Bucharest.

Fig.18: UAI last time with steady and occasional partners



Here again, the percentage of MSM reporting **UAI last time they had had sex with an occasional partner** was significantly higher for young people than older people (27.8 % and 20.2% respectively)²⁰.

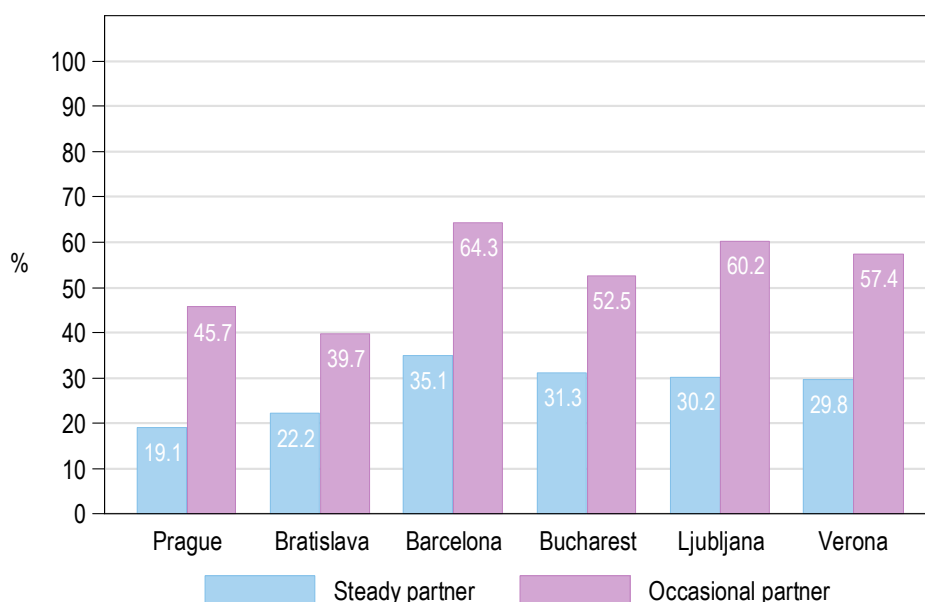
The proportion of MSM reporting UAI according to venue of last sexual encounter with occasional partner was 14.7% in sex- focused venues, 26.3% in private venues and 37.3% in the car.

²⁰ P<0.05

Condom use (UNGASS indicator 19)

This indicator describes the percentage of men reporting the use of a condom during their last anal sex episode with a male partner in the previous six months. Fig.19 presents the UNGASS 19 estimate by city and according to the type of partner. In Barcelona and Ljubljana more than 60% of respondents reported using a condom the last time they had had anal sex with an **occasional partner**. In Verona and Bucharest percentages were above 50 %, while percentages were lowest in Prague and Bratislava. With a **steady partner** the percentages were similar in Barcelona, Bucharest, Ljubljana and Verona (approximately 30%) and lower in Bratislava and Prague (approximately 20%).

Fig.19: UNGASS 19 MSM reporting the use of a condom the last time they had anal sex with a male partner in the last 6 months: steady and occasional partners



This indicator was significantly²¹ lower for young people (36.4%) than for older people (44.2%). This difference in condom use according to age was also significant at city level in Ljubljana²² and Verona²³ where this condom use indicator was lower among young MSM. In Bucharest²⁴ condom use was higher among young people.

²¹ P<0.005

²² P<0.005

²³ P<0.005

²⁴ P<0.05

The percentages of UAI with an occasional partner were highest in Bucharest, Prague and Bratislava both for the last sexual encounter and for encounters over the previous 6 months. In line with this finding, in these cities MSM reported less use of a condom for anal intercourse the last time.

Young people had riskier behaviour as the highest rates of unprotected anal intercourse with occasional partners, both last time and in the last 6 months, were found amongst young people under 25 years old.

As expected, UAI with a steady partner was more frequent than with an occasional partner, in all the cities.

The frequency of UAI reveals the need for preventive programmes specifically designed for this type of behaviour, particularly with occasional partners. These programmes should be directed at young people given the frequency of UAI in this group.

Greater protection in sex-focused venues was probably a result of environmental and psychological factors: condoms are frequently distributed free in these venues and sexual encounters are probably more planned.

6.6 RECEPTIVE UNPROTECTED ORAL INTERCOURSE (RUOI)

Receptive unprotected oral intercourse (RUOI) over the last 6 months²⁵

Receptive unprotected oral intercourse (RUOI) was defined as a receptive oral intercourse with ejaculation. The percentages of RUOI with steady and **occasional partners** over the last 6 months are shown in Fig.20 below.

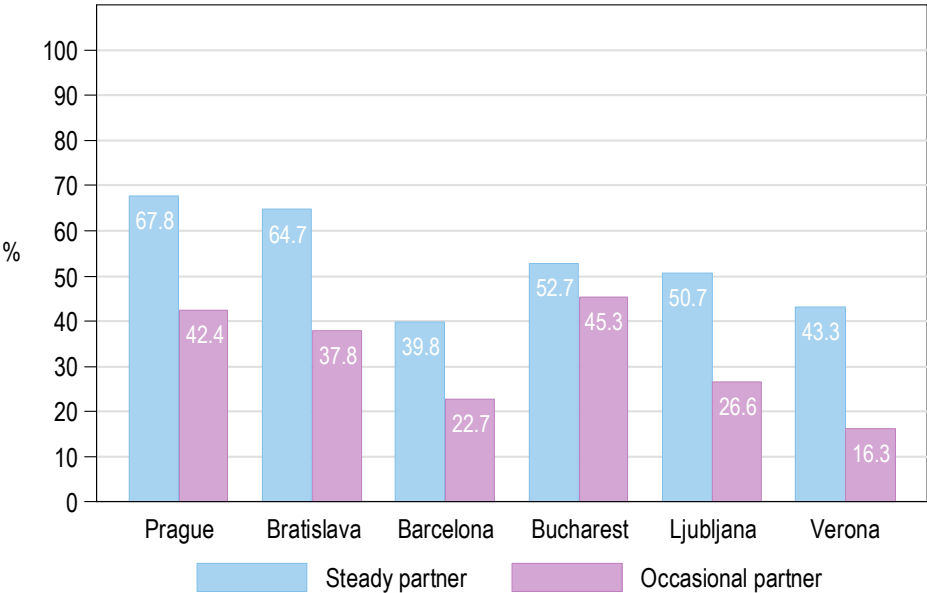
With an occasional partner, the percentage of RUOI in the last six months ranged from 16.3% in Verona to 45.3% in Bucharest. In the overall sample, almost one third of the respondents reported RUOI in the last six months (31.2%). Young MSM were more likely

²⁵ This variable was constructed taking into account respondents who answered they had RUOI "sometimes" or "often" in the last six months.

than older MSM to have RUOI (43.8% and 27.0% respectively²⁶). This was the case in Prague²⁷, Barcelona²⁸, Ljubljana²⁹ and Verona³⁰.

With a **steady partner**, the percentage of RUOI was significantly different from city to city, ranging from 39.8% in Barcelona to 67.8% in Prague. In the overall sample, almost one half (54.1%) of respondents declared they had had RUOI in the last six months with a steady partner and this kind of behaviour was most frequent for young MSM³¹. In fact, 63.4% of young MSM (< 25 years old) reported RUOI in the last six months, whilst the percentage fell to 50.7% for older MSM (≥ 25 years old).

Fig.20: RUOI with steady and occasional partners over the last 6 months.



²⁶ P<0.001

²⁷ P<0.05

²⁸ P<0.001

²⁹ P<0.05

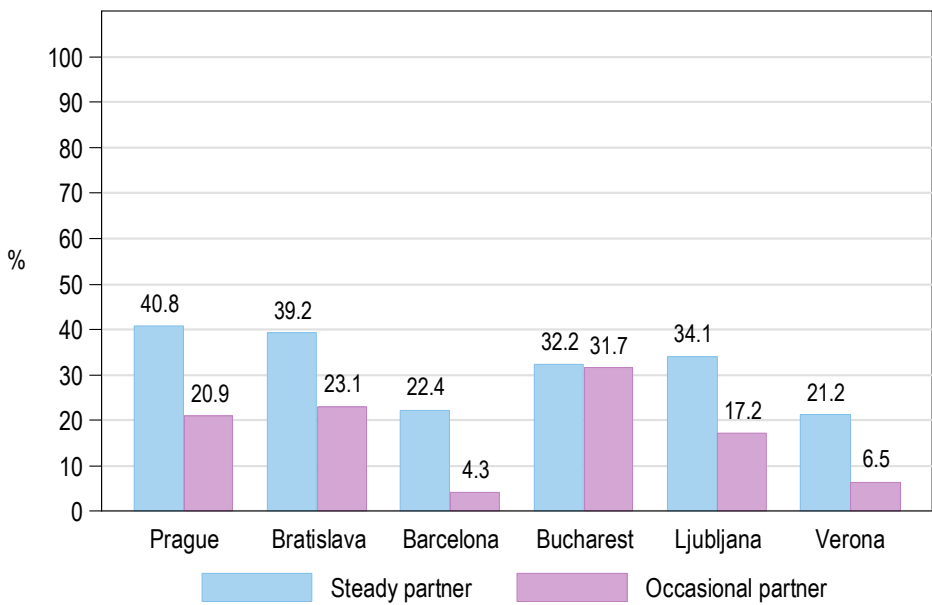
³⁰ P<0.05

³¹ P<0.001

Receptive unprotected oral intercourse (RUOI) during last sexual encounter

The percentages of this practice during the last sexual encounter are shown in Fig.21. For **occasional partners**, the percentages were lowest in Barcelona and Verona (4.3% and 6.5% respectively) with Ljubljana, Prague and Bratislava at 17.2%, 20.9% and 23.1% respectively. Bucharest had the highest figure (31.7%). Here too young people behaved with a higher degree of risk (24.4% of RUOI) than the elders (13.0%)³². With a **steady partner**, the percentages of RUOI were higher in all cities, ranging from 21.2% in Verona to 40.8% in Prague.

Fig. 21: RUOI with steady and occasional partners, last sexual encounter by city



The highest rates of receptive oral sex with ejaculation, both last time and in the last 6 months, were found in young people and in the East European cities (Bucharest, Bratislava, Prague and Ljubljana).

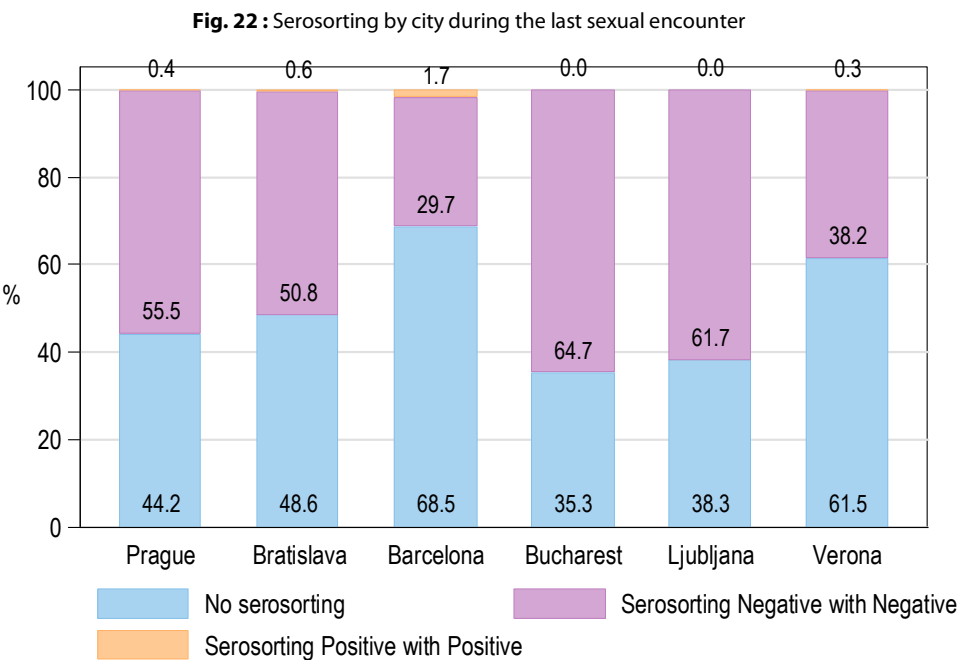
³² P< 0.001

6.7 Serostatus of partners and serosorting during last sexual encounter

Serostatus and serosorting

Respondents were asked to indicate the serostatus of their sexual partners³³. From this data a hypothetical serosorting was conjectured, this being the practice of identifying sexual partners based on their HIV serostatus: serosorting (HIV positive MSM who had sex with HIV positive MSM, HIV negative MSM with HIV negative MSM) and no serosorting (sex between two people of different or unknown serostatus).

Almost one half (49.4%) of last sexual encounters occurred between HIV negative MSM. As shown in Fig.22, in Bucharest and Ljubljana the percentages were high (64.7% and 61.7% respectively), while low levels were reported in Verona (38.2%) and Barcelona (29.7%). In the other cities, the percentages ranged from 55.5% (Prague) to 50.8% (Bratislava).



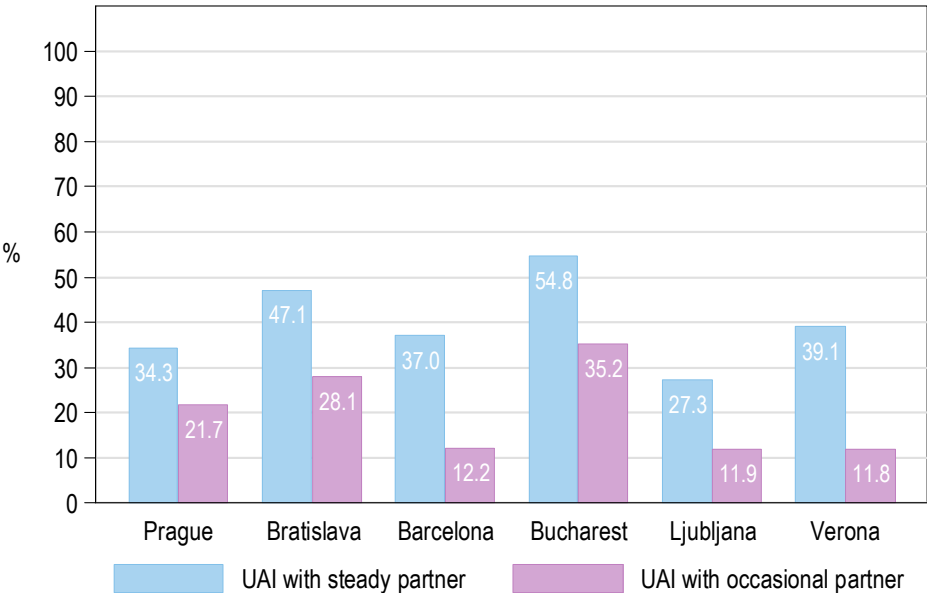
³³ No question was made about how they knew the serostatus of their partners. Therefore, data could be based on overt demands and declarations between the subjects, on shown certification or, on the contrary, on simple presumption.

For the last sexual encounter with an occasional partner, 70.1% of MSM had sex with a man of different or unknown serostatus. This figure was 29.5% with a steady partner.

Unprotected Anal Intercourse with partner of discordant or unknown serostatus

UAI with partner of discordant or unknown serostatus is shown in Fig23. Percentages of UAI with a steady partner of discordant/unknown serostatus was particularly high in Bucharest (almost 55.0%) and Bratislava (47.1%); the other cities had similar figures (ranging from 27.3% in Ljubljana to 39.1% in Verona). For sex with an occasional partner, these percentages were lower in each city. Here again Bucharest had the highest value (35.2%) followed by Bratislava and Prague (28.1% and 21.7% respectively) and the lowest values were in Barcelona, Ljubljana and Verona (12.2%, 11.9% and 11.8% respectively)

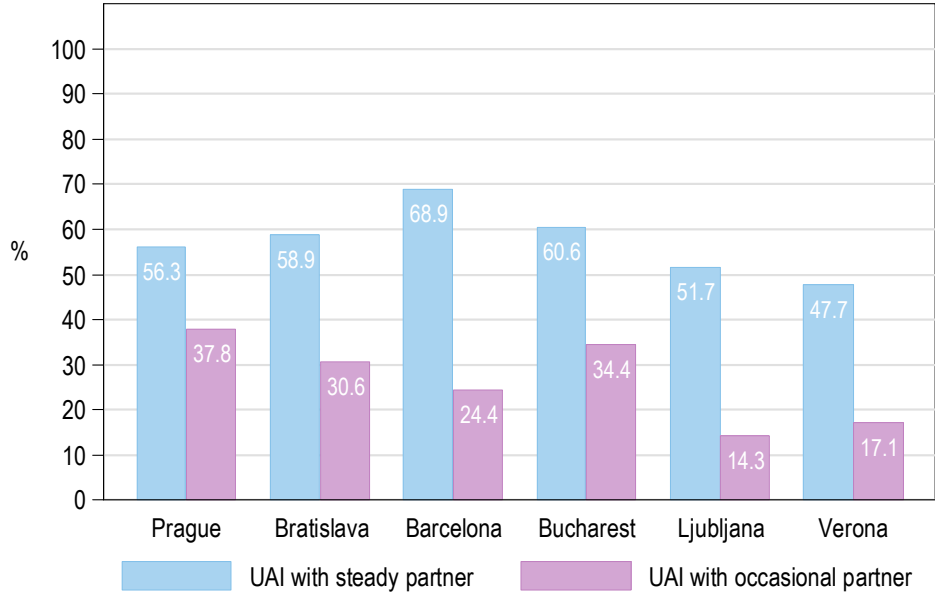
Fig.23: UAI with partner of discordant or unknown HIV serostatus during last sexual encounter with a steady or occasional partner



Unprotected Anal Intercourse with partner of concordant negative serostatus

UAI with partner of concordant HIV negative serostatus is shown in Fig 24. Comparing with data on UAI with serodiscordant partner, percentages for sex with an occasional partner were by far higher in Barcelona (24.4%) and Prague (37.8%) and slightly higher in Verona, Ljubljana and Bratislava. For sex with a steady partner, these percentages were considerably higher in Barcelona (68.9%), Prague (56.3%) and Ljubljana (51.7%) and slightly higher in the other cities.

Fig.24: UAI with partner of concordant HIV negative serostatus during last sexual encounter with a steady or occasional partner



In Eastern European cities more than half of subjects reported having had sex the last time with a partner with the same negative status whilst in Southern European cities this percentage was much lower. This could be due to the fact that in Eastern Europe MSM either trust declared negativity or presume negativity of their partners.

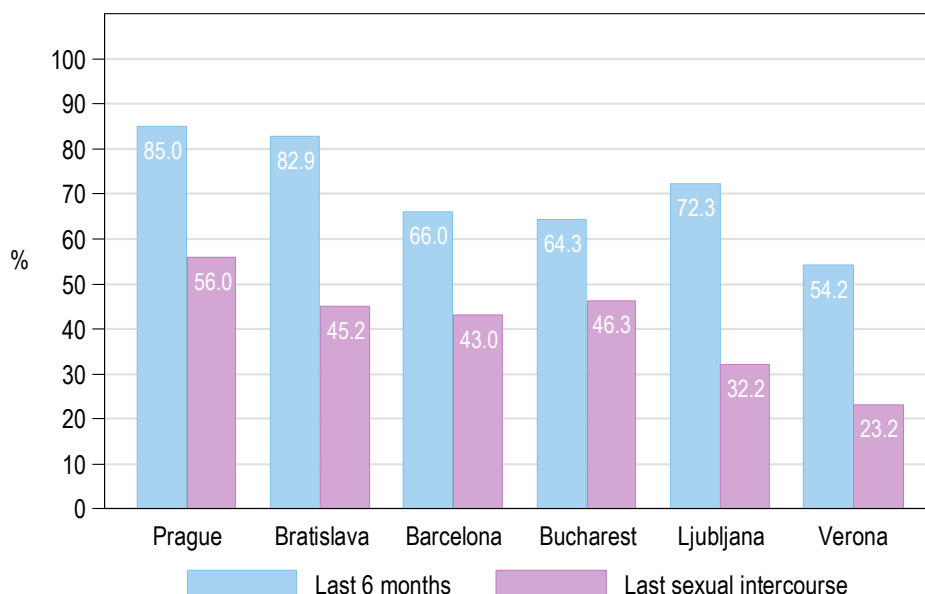
The comparison between UAI in serodiscordant intercourses and UAI in seroconcordant negative intercourses reveals that the latter are more frequent in almost all cities, particularly when steady partners are considered. Nevertheless, it seems that in some cities (Barcelona and Prague) serosorting is more frequently practiced as a preventive behaviour even with the occasional partner.

6.8 Use of alcohol and drugs before or during sex

Alcohol use during sex

As shown in Fig.24 below, 70.2% of respondents in the overall sample stated that they had used alcohol before or during sex in the last 6 months³⁴ (varying from 54.2% in Verona to 85.0% in Prague). 40.7% of the overall sample used alcohol before or during their last sexual encounter: a percentage higher than 50% was found only in Prague (56.0%), while rates lower than 40% were found only in Ljubljana (32.2%) and Verona (23.2%).

Fig.24: Use of alcohol before or during sex over the last 6 months



Psychoactive and recreational drug use over the last 6 months³⁵

Drug use before or during sex over the last 6 months³⁶ (see Fig.25 below), was higher in Ljubljana and Barcelona (almost 60% of respondents) and the lowest percentage was in

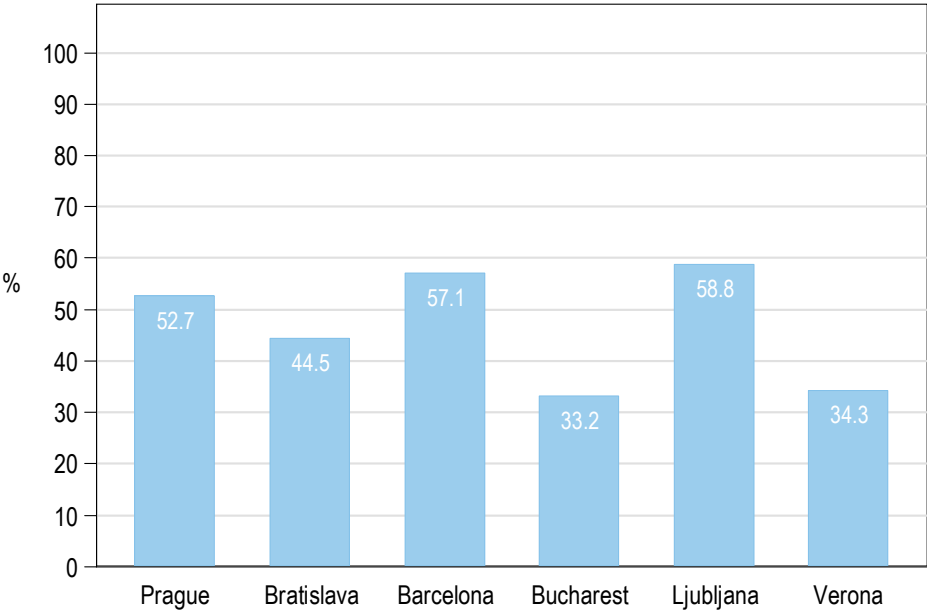
³⁴ This variable was constructed taking into account respondents who answered they used alcohol "sometimes" or "often" in the last six months.

³⁵ Use of at least one of the following: poppers, ecstasy, Viagra, cannabis, cocaine, amphetamine

³⁶ This variable was constructed taking into account respondents who answered they used at least one drug "sometimes" or "often" in the last six months.

Bucharest (33.2%). Here again the proportion of people using drugs during sex was significantly higher among HIV positive (68.5%) than negative (44.9%)³⁷ people.

Fig.25: Use of drugs before or while having sex in the last 6 months



At city level (see Fig.26) the proportion of HIV positive people using drugs during sex was statistically significantly higher among HIV positive people than among HIV negative people in Bratislava³⁸, Barcelona³⁹, Ljubljana⁴⁰ and Verona⁴¹. A very high proportion of HIV positive people used drugs during sex in Ljubljana (almost 94%).

³⁷ P<0.001

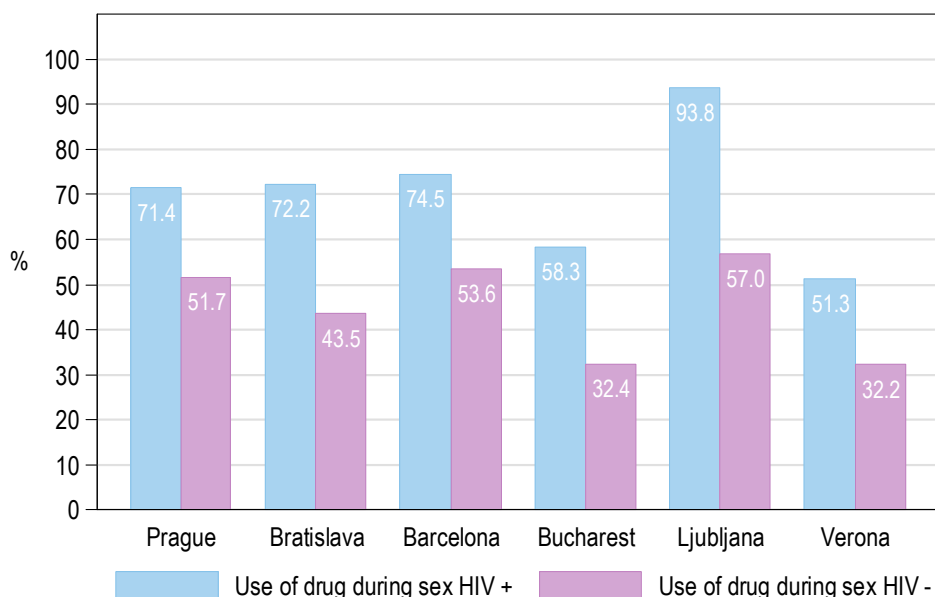
³⁸ P<0.05

³⁹ P<0.005

⁴⁰ P<0.005

⁴¹ P<0.05

Fig. 26: Use of drugs before or during sex in the last 6 months according to HIV status

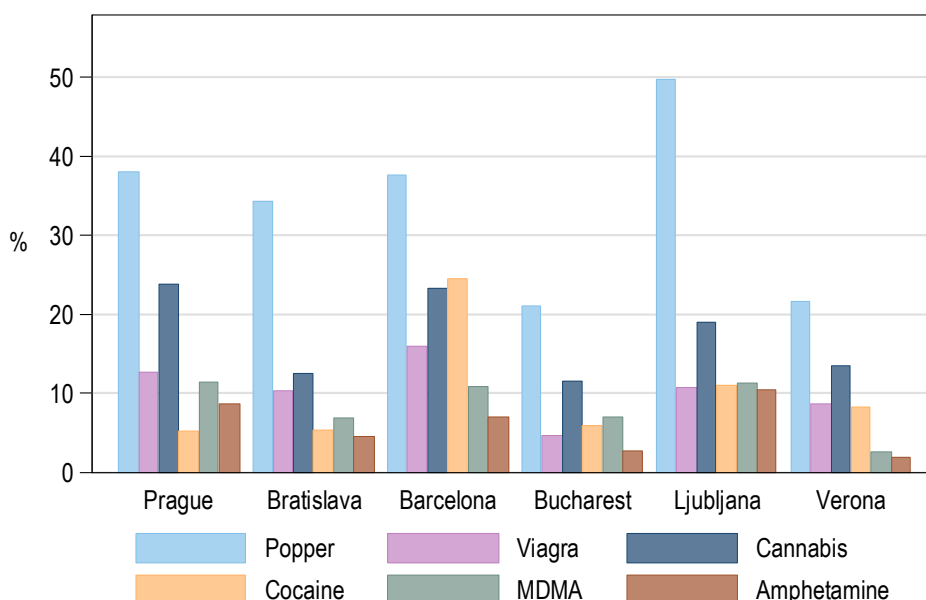


Type of drug used over the last 6 months⁴²

Poppers are one of the most popular substances in the gay scene and some authors refer to it as a gay drug [4]. As shown in Fig.27 below, the highest rate of **poppers** was found in Ljubljana (49.8%), with Prague, Barcelona and Bratislava at 38.1%, 37.6% and 34.3% respectively. The lowest percentages were in Verona (21.6%) and Bucharest (21.0%). For **MDMA**, the percentages of consumption were 11.4% in Prague, 11.3% in Ljubljana and 10.9% in Barcelona. 16.0% of MSM in Barcelona reported use of **Viagra**, 12.7% in Prague. Lower levels of consumption were reported in Bucharest (4.7%), Verona (8.6%) and Bratislava (10.2%). There were high levels of **cannabis** use in Prague, Barcelona and Ljubljana (23.8%, 23.2% and 19.1% respectively), while lower rates were reported in Verona (13.4%), Bratislava (12.4%) and Bucharest (11.5%). A high consumption of **cocaine** was found in Barcelona (24.5%). Similar levels of consumption were found in Prague (5.1%), Bratislava (5.3%), Bucharest (5.8%) and Verona (8.3%). The rate of **amphetamine** use ranged from 1.9% in Verona to 10.4% in Ljubljana.

⁴² This variable was constructed taking into account respondents who answered they used the cited drugs "sometimes" or "often" in the last six months.

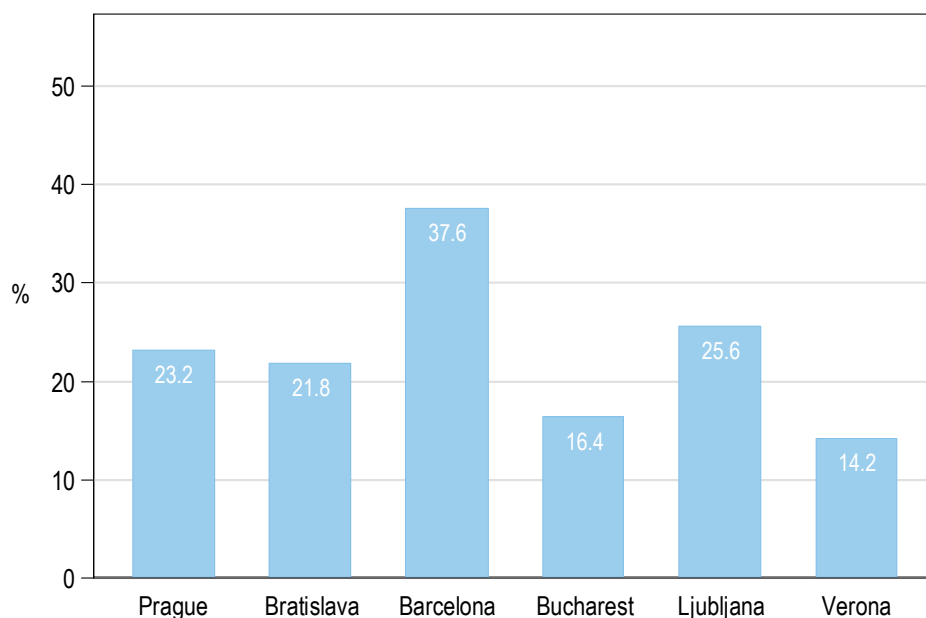
Fig. 27: Percentage of respondents reporting use of poppers, Viagra, cannabis, cocaine, ecstasy and amphetamine before or during sex over the last six months.



Psychoactive and recreational drug use during the last sexual encounter

23.2% of the overall sample used drugs, namely popper, Viagra, cannabis, MDMA, cocaine or amphetamine, before or during their last sexual encounter. As shown in Fig.28, percentage higher than 30% was found only in Barcelona (37.6%), while rates lower than 20% were found only in Bucharest (16.4%) and Verona (14.2%).

Fig.28: Use of drug during the last sexual encounter



In the overall sample, drug use was found to be higher among HIV positive people (43.1%) than HIV negative people (21.8%⁴³) before or during the last sexual encounter (a significant association was found in Prague⁴⁴, Bratislava⁴⁵, Barcelona⁴⁶ and Verona⁴⁷). For each individual drug, the association with HIV positive status was confirmed.

Relation between alcohol and drug use and risky sexual behaviour during the last sexual encounter with an occasional partner

In the overall sample, alcohol users behaved more riskily in their last sexual encounter with an occasional partner, both through UAI (28.8%⁴⁸) and RUOI (18.8%⁴⁹), compared to those reporting no use of alcohol (respectively 15.3% and 12.4%).

UAI was found to be higher among MSM who used at least one drug last time they had sex (35.0%) compared to those who didn't (17.1%)⁵⁰. For each individual drug, the

⁴³ P<0.001

⁴⁴ P<0.005

⁴⁵ P<0.05

⁴⁶ P<0.005

⁴⁷ P<0.05

⁴⁸ P<0.001

⁴⁹ P<0.01

⁵⁰ P<0.001

association with UAI was confirmed. RUOI was more frequent among people using MDMA (37.1%⁵¹) and amphetamines (35.7%⁵²) than among those who did not use them (respectively 14.9% and 15.0%).

At least one third of respondents had used drugs before or during sex over the last six months; this proportion was higher than a half in Ljubljana, Barcelona and Prague. Poppers was the most frequent drug used by at least 20% of respondents, reaching 50% in Ljubljana. Cannabis and cocaine were used by at least one fifth of respondents in only two cities. All other drugs were used by less than one fifth of MSM in all cities.

In the overall sample, an association was found between HIV positive status and the use of drugs during sex. Moreover, risky behaviour with occasional partner was more frequent among drug users: the percentages of UAI among MSM using drugs were significantly higher than for MSM who were drug free, while RUOI was significantly more frequent only among those who used ecstasy and amphetamines.

⁵¹ $P < 0.001$

⁵² $P < 0.005$

CONCLUSIONS

The quantitative and qualitative studies were specifically intended to triangulate behavioural data, risk factors, and HIV prevalence in order to improve our understanding of effective prevention strategies. UNGASS indicators proved to be very useful in focusing on specific topics such as access to prevention (testing and prevention programmes), high risk behaviours and HIV prevalence, and special attention was paid to people younger than 25 years old as suggested by UNAIDS surveillance guidelines.

Limited access to HIV screening services and prevention programmes was evident, particularly in people under 25 and in Eastern European cities such as Prague, Bratislava, Bucharest and Ljubljana. Moreover, health services and clinics have proved to have a very limited role in condom distribution programmes, while gay associations and venue-based distribution are vital for reaching the target population of MSM.

The highest rates of HIV seroprevalence were found in Southern European cities, namely Barcelona and Verona: this could be partly attributed to the older samples and therefore to longer exposure to risk, since HIV prevalence was higher among MSM of over 25. The highest rates of syphilis prevalence were also found in Barcelona and Verona. In general, our data confirm that a correlation exists between STI, previous syphilis, IgG anti-Treponema seroprevalence and HIV infection. The absolute need for prevention and information programmes for STI is clear, since the presence of an STI increases the risk of HIV infection. Moreover, coinfection is a serious concern for the spread of different HIV strains among HIV-positive people.

Since time and location sampling involves outreach work in the venues where MSM gather, data on HIV prevalence could be analysed taking into consideration the places where respondents met during data collection. According to this data, HIV prevalence was higher in sex-focused venues, namely saunas, cruising venues, sex shops and sex/naked parties. However, this finding was significant only in Verona, Bratislava and Ljubljana. Moreover, caution is required when seeking to draw conclusions about the link between HIV risk and types of venues. In fact, a greater extent of protected sex was reported in sex-focused venues and this is probably a result of environmental and psychological factors: condoms are frequently distributed free in these venues and sexual encounters are probably planned in advance.

Alarming findings included undiagnosed HIV infections. Over half the respondents were unaware of their HIV positive status: this proportion was slightly lower only in Barcelona, but very high (nearly 80%) in Ljubljana and Bucharest. Moreover, nearly one third of MSM found to be HIV-positive through oral fluid samples reported a negative HIV test result over the last 12 months, so the undiagnosed infections were recent. This figure was highest in Bucharest (over 50%) and lowest in Bratislava (less than 20%).

Data on HIV testing, prevention programmes and undiagnosed infections make it clear that more efforts should be made to improve access to HIV screening and condom distribution, and the planning of prevention strategies should involve the gay community in order to be successful. Moreover, the impact of perceived homonegativity on MSM access to health services should be taken into account.

The risk of HIV infection was assessed with a major focus on unprotected anal intercourse (UAI). Two respondents out of ten reported having had UAI with an occasional partner the last time they had sex, while four out of ten reported having had UAI in the last 6 months with this kind of partner or partners. The percentages of UAI with an occasional partner were highest in Bucharest, Prague and Bratislava both for the last sexual encounter and for encounters over the previous 6 months. In line with this finding, in these cities MSM reported less use of a condom for anal intercourse the last time they had anal sex. Young MSM exhibited the riskiest behaviour, as the highest rates of unprotected anal intercourse with occasional partners, both last time and in the last 6 months, were found amongst young people under 25 years old.

As expected, UAI with a steady partner was more frequent than with an occasional partner, in the overall sample and in all the cities.

The highest rates of receptive oral sex with ejaculation (RUOI), both last time and in the last 6 months, were found in young people and in the East European cities (Bucharest, Bratislava, Prague and Ljubljana).

The frequency of UAI reveals the need for preventive programmes specifically designed for this type of behaviour, particularly with occasional partners. These programmes should be directed at young people given the frequency of UAI in this group. Moreover, young people have proven to be a particularly vulnerable group for other risky behaviors as well, such as RUOI.

Another interesting topic was the reported serostatus of the partners during sexual encounters. In Eastern European cities more than half the subjects reported having had sex the last time with a partner with the same negative status whilst in Southern European cities this percentage was much lower. This could be due to the fact that in Eastern Europe MSM either trust declared negativity or presume the negativity of their partners.

The comparison between UAI in serodiscordant intercourse and UAI in seroconcordant negative intercourse reveals that the latter are more frequent in almost all cities, particularly with steady partners. Nevertheless, it seems that in some cities (Barcelona and Prague) serosorting is more frequently applied as preventive behaviour, even with the occasional partner.

Finally, the association between HIV risk and alcohol and drug use was confirmed. At least one third of respondents had used drugs before or during sex over the last six

months and half the respondents had used alcohol; this proportion was above half in Ljubljana, Barcelona and Prague for drugs, and higher than 80% in Prague and Bratislava. Poppers were the most frequent drug used by at least 20% of respondents, reaching 50% in Ljubljana. Cannabis and cocaine were used by at least one fifth of respondents in only two cities. All other drugs were used by less than one fifth of MSM in all cities.

In the overall sample, an association was found between HIV positive status and the use of drugs during sex. Moreover, risky behaviour with occasional partners was more frequent among drug users and among alcohol users last time they had sex. The percentages of UAI among MSM using drugs were significantly higher than for MSM who were drug free, while RUOI was significantly more frequent only among those who used ecstasy and amphetamines. Alcohol users also behaved more riskily, both through UAI and RUOI. These data suggest the need for health promotion and prevention messages particularly focused on sexual behaviour and alcohol and drug use.

REFERENCES

1. European Centre for Disease Prevention and Control / WHO Regional Office for Europe. HIV/AIDS Surveillance in Europe 2007. Stockholm: European Centre for Disease Prevention and Control; 2008. Available from: http://ecdc.europa.eu/en/publications/Publications/0812_SUR_HIV_AIDS_surveillance_in_Europe.pdf
2. Likatavičius G, Klavs I, Devaux I, Alix J, Nardone A. An increase in newly diagnosed HIV cases reported among men who have sex with men in Europe, 2000–6: implications for a European public health strategy. *Sex Transm Inf.* 2008;84(6):499-505
3. Joint United Nations Programme on HIV/AIDS (UNAIDS) and World Health Organization (WHO). Monitoring the Declaration of Commitment on HIV/AIDS: guidelines on construction of core indicators: 2010 reporting. Geneva: UNAIDS 2009. Available from: <http://www.unaids.org>
4. Colfax G, Coates TJ, Husnik MJ, Huang Y, Buchbinder S, Koblin B, et al. Longitudinal patterns of methamphetamine, popper (amyl nitrite), and cocaine use and high-risk sexual behavior among a cohort of San Francisco men who have sex with men. *J Urban Health.* 2005;82(1 Suppl 1):i62-70.
5. Mansergh G, Flores S, Koblin B, Hudson S, McKirnan D, Colfax GN, et al. Alcohol and drug use in the context of anal sex and other factors associated with sexually transmitted infections: results from a multi-city study of high-risk men who have sex with men in the USA. *Sex Transm Infect.* 2008;84(6):509-511
6. Folch C, Esteve A, Zaragoza K, Muñoz R, Casabona J. Correlates of intensive alcohol and drug use in men who have sex with men in Catalonia, Spain. *Eur J Public Health.* 2009 Jun 29.
7. Drumright LN, Strathdee SA, Little SJ, Araneta MR, Slymen DJ, Malcarne VL, et al. Unprotected anal intercourse and substance use before and after HIV diagnosis among recently HIV-Infected men who have sex with men. *Sex Transm Dis.* 2007;34(6):401-407
8. Bolding G, Hart G, Sherr L, Elford J. Use of crystal methamphetamine among gay men in London. *Addiction.* 2006;101(11):1622-30
9. Cowan SA, Haff J. HIV and risk behaviour among men who have sex with men in Denmark--the 2006 Sex Life Survey. *Euro Surveill.* 2008;13(48).pii=19050. Available from: <http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=19050>

10. Schwarcz S, Scheer S, McFarland W, Katz M, Valleroy L, Chen S, et al. Prevalence of HIV infection and predictors of high-transmission sexual risk behaviors among men who have sex with men. *Am J Public Health*. 2007;97(6):1067-75
11. Koblin BA, Husnik MJ, Colfax G, Huang Y, Madison M, Mayer K, et al. Risk factors for HIV infection among men who have sex with men. *AIDS*. 2006;20(5):731-9
12. Joint United Nations Programme on HIV/AIDS (UNAIDS) and World Health Organization (WHO). Initiating second generation HIV surveillance systems: practical guidelines. Available from: <http://www.who.int/hiv/pub/surveillance/guidelines/en/index.html>
13. Joint United Nations Programme on HIV/AIDS (UNAIDS) and World Health Organization (WHO). The pre-surveillance assessment. Guidelines for planning serosurveillance of HIV, prevalence of sexually transmitted infections and behavioural components of second generation surveillance of HIV. Available from: <http://www.who.int/hiv/pub/surveillance/sti/en/index.html>
14. Joint United Nations Programme on HIV/AIDS (UNAIDS). Monitoring the Declaration of Commitment on HIV/AIDS – guidelines on construction of core indicators – 2008 Reporting UNGASS. Available from: <http://www.unaids.org>
15. Williamson LM, Hart GJ. HIV prevalence and undiagnosed infection among a community sample of gay men in Scotland. *J Acquir Immune Defic Syndr*. 2007;45(2):224-30
16. Nokes DJ, Enquselassie F, Vyse A, Nigatu W, Cutts FT, Brown DW. An evaluation of oral-fluid collection devices for the determination of rubella antibody status in a rural Ethiopian community. *Trans R Soc Trop Med Hyg*. 1998;92(6):679-85
17. Ramsay M, Brugha R, Brown D. Surveillance of measles in England and Wales: implications of a national saliva testing programme. *Bull World Health Organ*. 1997;75(6):515-21.
18. Stueve A, O'Donnell LN, Duran R, San Doval A, Blome J. Time-space sampling in minority communities: results with young Latino men who have sex with men. *Am J Public Health*. 2001;91(6):922-6
19. MacKellar DA, Gallagher KM, Finlayson T, Sanchez T, Lansky A, Sullivan PS. Surveillance of HIV risk and prevention behaviors of men who have sex with men: a national application of venue-based, time-space sampling. *Public Health Rep* 2007;122 Suppl 1:39-47

20. Gallagher KM, Finlayson T, Sanchez T, Lansky A, Sullivan PS. Surveillance of HIV risk and prevention behaviors of men who have sex with men-a national application of venue-based, time-space sampling. *Public Health Rep.* 2007;122 Suppl 1:39-47
21. Muhib FB, Lin LS, Stueve A, Miller RL, Ford WL, Johnson WD, et al. A venue-based method for sampling hard-to-reach populations. *Public Health Rep.* 2001;116 Suppl 1:216-22
22. Folch C, Casabona J, Munoz R, Zaragoza K. [Trends in the prevalence of HIV infection and risk behaviors in homo- and bisexual men]. *Gac. Sanit.* 2005;19(4):294-301. Spanish.
23. Genscreen HIV-1|2 Assay Version 2 Bio-Rad Laboratories, Inc.1000 Alfred Nobel Drive Hercules CA 94547 United States 5107247000, <http://www.bio-rad.com>
24. Baguley SDK, Horner PJ, Maple PAC, Stephenson I. An oral fluid test for syphilis. *International journal of STD & AIDS.* Vol16, Number 4, 2005April;299-301.
25. Maple PAC, Simms I, Kafatos G, Solomou M, Fenton K. Application of a noninvasive oral fluid test for detection of treponemal IgG in a predominantly HIV-infected population. *Eur J Clin Microbiol Infect Dis.* 2006;25:743-749.
26. Lambert NL, Fisher M, Imrie J, Watson R, Mercer CH, Parry JV, et al. Community based syphilis screening: feasibility, acceptability, and effectiveness in case finding. *Sex Transm Infect.* 2005;81(3):213-216
27. Klein, F. *The bisexual option* (2nd ed.). 1993. New York: The Harrington Park Press.
28. Savin-Williams, RC. *The new gay teenager.* 2005. Cambridge, MA: Harvard University Press.
29. Fox, RC. Bisexuality in perspective. A review of theory and research. 1996. In B. Firenstein (Ed.), *Bisexuality: The psychology and politics of an invisible minority.* Thousand Oaks, CA: Sage.
30. Pérez K, Rodes A, Casabona J. Monitoring HIV prevalence and behaviour of men who have sex with men in Barcelona, Spain. *Euro Surveill.* 2002;7(2):pii=345. Available from: <http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=345>
31. Centre for Sexually Transmitted Infection and AIDS Epidemiological Studies of Catalonia (CEEISCAT). Integrated AIDS/HIV/STI Surveillance System of Catalonia (SIVES): biennial epidemiological report [Internet]. Barcelona: Generalitat de Catalunya, Departament de Salut; 2008 - Technical document 19. Available from: http://www.ceescat.org/Index_Ing.htm

32. Klavs I, Poljak M. Unlinked anonymous monitoring of human immunodeficiency virus prevalence in high- and low-risk groups in Slovenia, 1993–2002. *Croatian Med J.* 2003;44(5):545–9
33. Staneková D, Habeková M, Wimmerová S, Gramblickova I. HIV infection and sexual behaviour among homosexuals and bisexual men in Bratislava. *Cent Eur J Public Health.* 2000;8(3):172–5
34. Marcus U, Voss L, Kollan C, Hamouda. HIV incidence increasing in MSM in Germany: factors influencing infection dynamics. *Euro Surveill.* 2006;11(9):pii=645. Available from: <http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=645>
35. Davidovich U, de Wit JB, Stroebe W. Assessing sexual risk behaviour of young gay men in primary relationships: the incorporation of negotiated safety and negotiated safety compliance. *AIDS.* 2000;14(6)701-6

