Sialon II

Capacity building in combining targeted prevention
with meaningful HIV surveillance among MSM

REPORT ON A BIO-BEHAVIOURAL SURVEY AMONG MSM IN 13 EUROPEAN CITIES

CIERRE GRAFICA

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Co-funded by the Health Programme of the European Union

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LIST OF ABBREVIATIONS

AI	Anal intercourse
AIDS	Acquired immune deficiency syndrome
ARV	Antiretroviral
CI	Confidence interval
DE	Design Effect
EC	European Commission
ECDC	European Centre for Disease Prevention and Control
EEA	European Economic Area
EU	European Union
GARPR	Global AIDS Response Progress Reporting
GUM	Genito-urinary medicine
HBV	Hepatitis B Virus
HCV	Hepatitis C Virus
HIV	Human Immunodeficiency Virus
LGV	Lymphogranuloma venereum
MS	Member State
MSM	Men who have Sex with Men
NGO	Non-Governmental Organization
NSP	Non-Steady Partner
OF	Oral Fluids
PEP	Post-Exposure Prophylaxis
PIS	Participant Information Sheet
RDS	Respondent-Driven Sampling
SGSS	Second Generation Surveillance System
SD	Standard Deviation
SE	Standard Error
SP	Steady Partner
STI	Sexually Transmitted Infection
TLS	Time-Location Sampling
UAI	Unprotected Anal Intercourse
UN	United Nations
UNAIDS	The Joint United Nations Programme on HIV/AIDS
UNGASS	United Nations General Assembly Special Session
VCT	Voluntary Counselling and Testing
VDT	Venue-Day-Time
WHO	World Health Organization

Executive Summary

This report presents the findings from a large-scale bio-behavioural survey implemented across 13 European countries. The survey was implemented in the context of the European Commission co-funded Sialon II project (see www.sialon.eu). The overall objective of the Sialon II project (2011-2014) was to carry out and promote combined and targeted prevention, complemented by meaningful surveillance, among MSM. The Sialon II project follows on from its predecessor Sialon (2008-2010); both projects were set within a context of rising HIV infections among MSM in many countries across Europe as indicated by both the ECDC and the other scientific literature.

The Sialon II survey employed two different probability sampling procedures, namely Time-Location Sampling (TLS) and Respondent-Driven Sampling (RDS). These two methods allowed researchers to enrol heterogeneous populations and to collect reliable information on behaviour patterns, prevention needs and sexual health in the MSM population. The survey is without precedence in Europe in terms of its size and from the point of view of the practical implementation of the WHO – Joint United Nations Programme on HIV/AIDS (UNAIDS) Second Generation Surveillance System (SGSS) approach and behavioural surveillance recommendations from the ECDC.

The TLS method was adopted in Belgium, Bulgaria, Germany, Poland, Portugal, Slovenia, Spain, Sweden, and the UK whereas the RDS method was employed in Italy, Lithuania, Romania, and the Slovak Republic. The choice of sampling procedure was dependent both on the cultural and social characteristics of the participating cities and taking into consideration the activities of the previous Sialon project where only the TLS method was employed.

Data from the Sialon II survey have provided a wealth and diversity of insights regarding: access to prevention programs and testing in each partner country; results on sexual behaviour in the last six months (with steady and non-steady partners) including condom use; as well as findings relating to commercial sex, 'fisting', treatment and viral load, substance (mis)use, and sexual health (sexual satisfaction, sexual safety, and sexual autonomy). In terms of HIV prevalence, data suggested a range between 2% and 20%, with higher prevalence among individuals older than 25 years of age. A relevant proportion (ranging between 12% and 88%) of participants were unaware of being HIV-positive.

On the one hand, the findings confirm the already identified trend of rising infection among MSM in Europe.

One the other hand, the data reveal some alarming findings with regard to prevention, treatment and support to MSM and underline the disparities within Europe.

The high number of MSM who were tested for the first time in the context of this survey, in particular in the Eastern European survey cities and the high estimates of HIV positive participants unaware of their real serum-status, seem to suggest critical conditions in terms of future increase of the HIV epidemic. The situation seems to be particularly concerning in Eastern European cities, where a low level of condom use is reported, as well as a high level of perceived discrimination.

The lack and/or delay in diagnosis is also a crucial factor in general. In several cities, the treatment coverage is less than optimal among individuals who know they are HIV positive indicating potential challenges in linkage to care and continuity of care.

This scenario reflects the marked diversity of the societal and political contexts of the countries involved, in particular with respect to the social and legal conditions for sexual minority emancipation. This will obviously have an impact on both surveillance and prevention activities and needs to be taken into consideration in the definition of policy in this area. This means that in addition to concrete measures such as increased condom distribution networks and promotion of testing and treatment, policy actions must also address the social determinants of high risk behaviour and low uptake of testing for HIV and other STIs such as homophobia and stigma.

Similarly, the segmentation and the complexity of the MSM population which this survey has contributed to identifying, point to the need to design targeted HIV prevention and health promotion interventions by subgroups. For example, young MSM (<25 years) presented a particularly vulnerable subgroup of MSM engaging in high risk behaviour and experiencing a high perception of homonegativity. Another main subgroup identified in Sialon II are MSM attending venues from other European countries including migrants (non-native or non-resident MSM) and tourists, raising issues of increased vulnerability due to multiple marginalization in the case of migrants or limited access to prevention activities in the case of tourists.

To conclude, the findings of Sialon II survey represent a valid contribution to the pool of epidemiological research that has been has undertaken to date in the area of HIV/STI prevention among MSM. However, at the same time, the results also point to the urgent need for continued and more widespread data collection (in line with the SGGS) to better understand the marked differences in prevention needs across Europe and among sub-populations of MSM and hence to better define more effective and efficient prevention strategies.

Acknowledgments

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1. Introduction

General introduction to the report

This document is a key deliverable of the European Sialon II project co-funded by the European Commission (see www.sialon.eu). It presents the main results of the Sialon II project and focuses specifically on the findings from a large-scale bio-behavioural survey implemented across 13 European countries.

In Chapter 2, the background to the Sialon II project is outlined including a summary of the relevant literature and an overview of the current debates regarding the HIV/STI epidemic within Europe. In Chapter 3, the methodology of the Sialon II bio-behavioural survey is presented, summarising the main procedural and technical issues involved. Ethical considerations relating to implementation from initial data collection to delivery of the test results and data analysis are then explored in Chapter 4.

The main results from the Sialon II survey are presented in Chapter 5 which includes a series of related subsections as follows: in Section 5.1, a detailed description of the sample including socio-demographic characteristics is provided. Data on access to prevention programmes and testing are explored in Section 5.2; Section 5.3 presents findings on sexual behaviour in the last six months with male non-steady partners, whereas Section 5.4 presents data on sexual behaviour in the last six months with male steady partners. Insights on sexual behaviour with female partners are provided in Section 5.5. Data on sexual behaviour during the last episode of sexual intercourse and on commercial sex are presented in Sections 5.6 and 5.7 respectively. Details on high risk behaviour (fisting) are reported in Section 5.8. Estimates on HIV and other STIs are provided in Section 5.9, whilst Section 5.10 focuses on treatment and viral load data. A comprehensive presentation of the project's main results is completed by final sections on sexual health (5.11) and substance (mis)use (5.12).

In Chapter 6, the main findings and potential implications of the Sialon II data are discussed. Finally, in Chapter 7, the project's key conclusions are presented followed by a series of recommendations for future action in the area of HIV/STI prevention.

Notes on the presentation of findings and other issues

During data analysis, the two different sampling methods used by the Sialon II survey (TLS and RDS) were

taken into account[1]. However, in order to provide the reader with clear and easy-to-read tables and graphs, data are presented at city level independently from the actual sampling method used. In other words, data related to the cities are listed in alphabetical order (in both graphs and tables) without separating into TLS and RDS recruitment sites.

As final remark, this report is based on data from the Sialon II project, co-funded by CHAFEA under the 2008-2013 Second Health Programme (Work Plan 2010). The sole responsibility lies with the authors of this report, and the Commission is not responsible for any use that may be made of the information contained therein.

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1 Details of all data analysis procedures and protocols will be made available in future publications

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2. Background

Summary

The HIV epidemic among MSM continues to represent a pressing public health issue in Europe. The need of structured surveillance initiatives where both biological (e.g. oral fluid) and behavioural data (e.g. from questionnaires) are collected, is evident. The use of a common set of indicators adopted across Europe is also a key factor in monitoring the epidemic.

The Sialon II project, in line with the international literature (e.g. UNAIDS, WHO and ECDC reports and guidelines), includes the use of GARPR indicators and WHO-UNAIDS guidelines on testing in the framework of epidemiological studies. The project has contributed significantly to the harmonisation of surveillance methods across participating countries, delivering comparable data from behavioural and epidemiological indicators for MSM communities.

Introduction

This chapter provides an overview of the current situation with regard to MSM and HIV in Europe. In particular, attention is drawn to some of the pressing issues relating to the monitoring of the epidemic and the urgent need for reliable and comparable data across European countries. Details of the first Sialon project are provided followed by a description of the subsequent SIALON II project including the survey objectives and an overview of the participating countries. In the final part of the chapter, a number of conclusions are highlighted relating to the contribution of the Sialon II research.

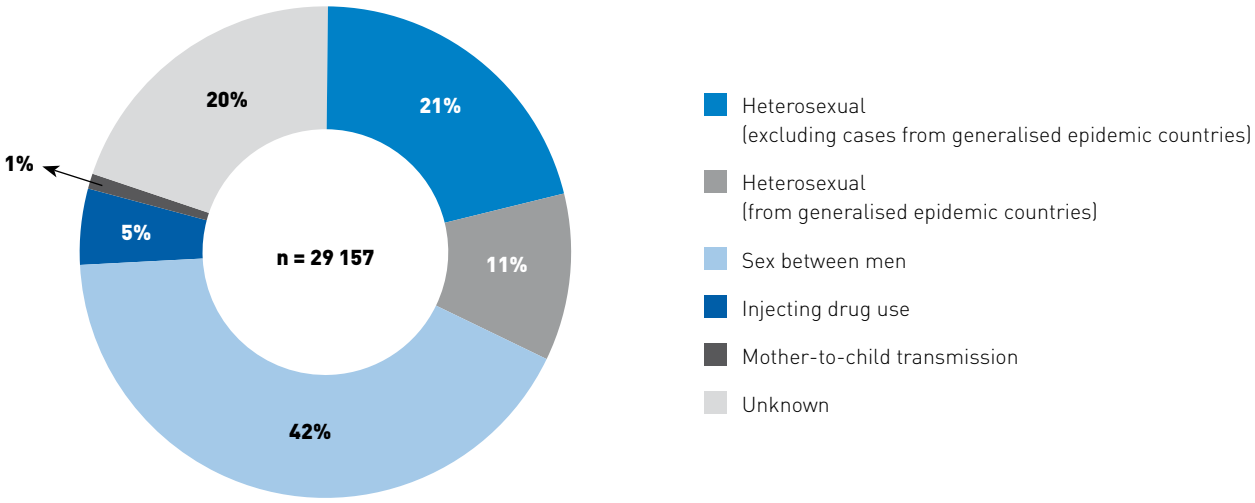
HIV and MSM in Europe

The HIV epidemic continues to represent a critical public health issue in Europe and elsewhere (ECDC/WHO, 2013). Data and documents from the ECDC show that for the WHO European Region, 136.235 new HIV diagnoses

were reported in 2014, with a rate of 15.7 per 100.000. Therefore, the cumulative number of infections diagnosed in the WHO European Region increased to a total of 1,715,434.

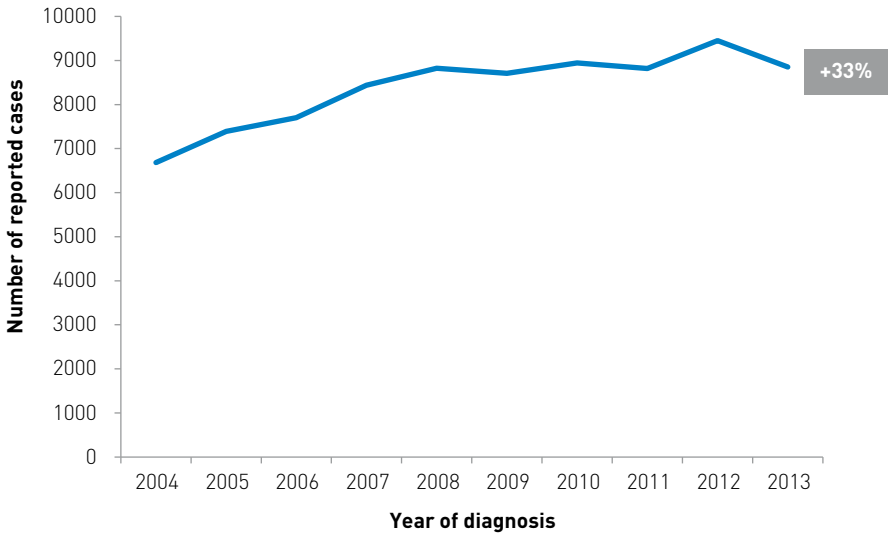
With regard to the mode of transmission in the EU/EEA countries in 2013, the highest proportion of new HIV diagnoses was reported in men who have sex with men (MSM) accounting for 42% of all new infections (compared to 40.4% in 2012) (ECDC / WHO, 2014).

Mode of transmission of newly-diagnosed HIV cases reported in the EU/EEA 2013 (ECDC / WHO, 2013)



In EU/EEA countries where data are available, since 2004 HIV diagnoses have increased by 33% among MSM, confirming that this specific sub-population continues to represent a majority of the new HIV infected people across Europe. Consequently, this sub-population is considered as a population at high risk for acquiring HIV.

Number of new HIV diagnoses among MSM EU/EEA 2004-2013 (ECDCl / WHO, 2013)



Moreover, according to the most recent data available from the ECDC (2015), HIV prevalence among MSM appears to be 5% or above in more than half of all EU/EEA countries. According to the Global AIDS Response

Progress Reporting (GARPR) disaggregation, reported prevalence is lower for MSM under 25 years old (roughly 2.9%) than for MSM over 25 years old (roughly 7.7%) (ECDC, 2015). In general, new diagnoses have increased dramatically in younger MSM in the EU/EEA area: between 2004 and 2013, the number of new HIV-positive MSM aged 20-24yrs almost doubled, whereas in adult MSM (30-39 years old) the estimates remain relatively stable.

Whilst these levels of new diagnoses and HIV prevalence could be due to increasing HIV testing, it is also likely that new diagnoses in the younger age groups represent ongoing transmission in this specific population. Indeed, with regard to the latter, according to the current scientific literature an increase of high risk sexual practices (such as unprotected anal intercourse) has been reported among MSM across Europe (ECDC / WHO, 2014; ECDC, 2012). Almost one third of all HIV infected MSM in Europe are estimated to be unaware of their seropositive status.

Monitoring the epidemic: GARPR indicators

HIV diagnosis represents a key surveillance activity for monitoring the HIV epidemic especially in 'hard-to-reach' populations such as MSM. Reliable and comparable data, including trends in risk behaviours over time, are of crucial importance in order to monitor the outbreak of infections, and to understand whether and by how much rates are increasing and which populations (or sub-populations) are affected the most.

Consequently, the international literature has stressed the need for public health to embrace three main approaches in monitoring and controlling the epidemic: (i) a structured surveillance system method, the so-called Second Generation Surveillance System; (ii) the use a of common set of indicators adopted across Europe, and; (iii) specific prevention campaigns targeting MSM and testing promotion.

In terms of structured surveillance initiatives and in response to the growing awareness of the urgency for a comprehensive and effective response, a number of European countries have implemented surveys specifically targeting MSM (Elford, 2009) focusing primarily on the monitoring of risk behaviours. A SGSS approach (UNAIDS, 2002), where both biological (e.g. oral fluid) and behavioural data (e.g. from questionnaires) are collected and triangulated, has unfortunately only been adopted in a limited number of studies (Dubois-Arber, 2010). This represents a challenging issue and limits the value of such targeted initiatives due to, amongst others, a lack of comparability of data across European countries (UNAIDS Joint United Nations Programme on HIV/AIDS and WHO, 2000). A SGSS approach is defined by the WHO as the "regular, systematic collection, analysis and interpretation of information for use in tracking and describing changes in the HIV/AIDS epidemic over time". This approach is central not only because it allows the public health sector to monitor the spread of infections in a given population and to analyse trends over time, but also as it can facilitate countries in improving their planning of prevention initiatives.

With regard to the use of common indicators across Europe to monitor and control the epidemic, implementation is not systematic. Often considerable variations across countries are reported both in terms of the specific indicators used and the way in which such indicators are calculated and used for reporting. Consequently, the implementation of harmonised HIV-STI surveillance systems across Europe could be a crucial tool in monitoring the HIV epidemic effectively in high-risk populations including MSM (Elford J, 2009).

In 2001 the United Nations General Assembly, in a Special Session on HIV/AIDS, proposed the construction of a set of core indicators, namely the UNGASS indicators to boost the harmonisation of data at the international level (UNAIDS, 2008; WHO/UNAIDS, 2009). These UNGASS indicators have been revised and updated periodically, becoming in 2012 "the Global AIDS Response Progress Reporting (GARPR) indicators". The most recent version of the indicators guidelines were released in 2014 by UNAIDS, UNICEF and the WHO (UNAIDS, 2014). Through the framework of monitoring the Dublin Declaration in Europe and Central Asia, ECDC and WHO have harmonised its indicators on HIV testing, condom use and HIV prevalence among MSM (UNAIDS/WHO working group on global HIV/AIDS and STI surveillance, 2011).

GARPR indicators represent a unique tool that can assist countries in evaluating the effectiveness of their HIV-STIs programmes, providing policy makers, scientific communities, civil societies and other stakeholders

with clear and direct markers on the status of the epidemic across different target-groups. Moreover, when GARPR data are collected and investigated across several countries, such indicators can provide crucial insights from a regional perspective, also providing a general overview of prevention needs or areas where the implementation of specific actions or campaigns is urgently needed.

The first Sialon project (2008-2010)

The first Sialon project (Sialon: Capacity building in HIV/Syphilis prevalence estimation using non-invasive methods among MSM in Southern and Eastern Europe) was funded under the 2003-2008 Public Health Programme (work plan 2007) (Mirandola, 2009). The project was designed to obtain reliable and valid data on HIV and Syphilis prevalence, as well as explore associated risk behaviours including cultural factors among MSM. Non-invasive outreach testing was used based on oral fluid sample collections and an anonymous questionnaire was administered for collecting behavioural data. Time-Location Sampling (TLS) was adopted with the active involvement of gay associations in each data collection site. The study was a descriptive multi-centre biological and behavioural cross-sectional survey carried out in seven Southern and Eastern European cities including: Athens (Greece); Barcelona (Spain); Bratislava (Slovakia); Bucharest (Romania); Ljubljana (Slovenia), Prague (Czech Republic); and Verona (Italy). International core indicators (called UNGASS indicators at that time, now GARPR indicators) were utilised in order to collect reliable and comparable data across participating countries.

The Sialon results (Mirandola, 2009) highlighted primarily the need for health promotion and prevention messages to be focused particularly on sexual behaviour, as well as raising the importance of testing promotion especially among young MSM, and highlighting the urgency of collecting additional and reliable information for STIs other than HIV. Data generated through the first Sialon project were used not only to monitor the respective HIV epidemics in partner countries, but also to harmonise the data collection process across the participating countries. In doing so, the study's protocols proved to be an effective tool in planning and implementing large scale bio-behavioural surveys. As a result, a second Sialon II project was developed and submitted for funding to the EC's 2008-2013 Public Health Programme.

The Sialon II project

Building on the successes and experiences of the first Sialon project (Mirandola, 2009), and in line with the 2009-2013 European Commission (EC) Communication on combating HIV/AIDS in the European Union (EU) and neighbouring countries (EC, 2009) and with the operational Action Plan which has recently been updated to cover the period 2014-2016 (EC, 2014), the overall objective of the Sialon II project was to carry out and promote combined and targeted prevention, complemented by meaningful surveillance, among MSM.

More specifically, the aim was to build capacity, knowledge, and expertise across the participating countries in terms of delivering effective prevention actions and of implementing innovative surveillance methodologies for MSM.

Sialon II was funded under the EC Public Health Programme 2008-2013 (Work Plan 2010). The project's strategic relevance was threefold: i) Sialon II collected behavioural and biological data as well as assessed the prevention needs of MSM in line with the WHO and UNAIDS' recommendations on SGSS; ii) the project addressed directly the need for effective responses in priority regions such as the EU Member States most affected by HIV; and iii) complementing the EC's 2010 Health Programme, Sialon II targeted MSM specifically as a (sub) population at high risk of acquiring HIV and other STIs.

Sialon II worked in active collaboration with diverse gay communities in all phases of the project actions. As examples, this included members of gay communities as project partners, as key collaborators, and as key informers in developing and implementing targeted and culturally sensitive strategies of communication for the

prevention of HIV and promotion of Voluntary Counselling and Testing (VCT) among MSM. Sialon II also worked in partnership with other major stakeholders including the ECDC, the WHO and UNAIDS, particularly during the initial development phase of the project. Such collaborations contributed considerably to the development and successful application of standard methodologies across the partner countries (including the research protocols, core GARPR/ECDC indicators, and epidemiological algorithms) as well as refining the specific prevention strategies to be implemented. Finally, further to collaborations with European institutions and countries, new partnerships were also established with EU neighbouring countries including Armenia and Moldova with the support of the WHO and UNAIDS.

Sialon II survey objectives

The Sialon II survey had the following primary objectives:

- To pilot the implementation of a bio-behavioural survey using different sampling methods, namely Time-Location Sampling (TLS) and Respondent-Driven Sampling (RDS);
- To estimate anti-HIV-Ab prevalence among MSM in data collection using the TLS method;
- To estimate anti-HIV-Ab, Syphilis, HBV-HVC prevalence among MSM in data collection sites using the RDS method;
- To identify, describe and analyse sexual risk behaviour patterns, prevention needs and sexual health in the MSM population, triangulating the behavioural data (risk behaviours, socio-ecological or contextual factors) and the biological information.

As noted earlier, these survey objectives were consistent with the SGSS approach and with the ECDC and WHO behavioural surveillance recommendations (UNAIDS/WHO working group on global HIV/AIDS and STI surveillance, 2011). The main GARPR indicators related to MSM which were included in the Sialon II surveys were as follows:

- Indicator 1.11: Men who have sex with men: prevention programmes (percentage of men who have sex with men reached with HIV prevention programmes);
- Indicator 1.12: Men who have sex with men: condom use (percentage of men reporting the use of a condom the last time they had anal sex with a male partner);
- Indicator 1.13: HIV testing in men who have sex with men (percentage of men who have sex with men who received an HIV test in the past 12 months and know their results);
- Indicator 1.14: HIV prevalence in men who have sex with men (percentage of men who have sex with men risk who are living with HIV).

In terms of behaviours, the broader scientific literature as well as WHO-UNAIDS specific publications, stress the importance of monitoring key behaviours and attitudes connected to the transmission of HIV and STIs, namely:

- Sexual behaviour (condom use, sexual practices, number and type of sexual partners);
- Substance use/abuse;
- Health seeking behaviours (access to VCT);
- STI indicators (self-reported past history of STI testing/STI (all sites), and biomarkers).

In addition, given that behaviours are strongly influenced by characteristics of the socio-ecological environment (e.g. such as public policy on HIV, different types of social venues targeting MSM such as discos, bars, clubs, saunas etc. as well as access to, and quality of, local health and care services) (Dahlgren, 1991), Sialon II also considered how knowledge about such characteristics might be useful in improving sexual health and prevention activities and programmes for MSM.

Overview of the Sialon II survey countries

In Sialon II, a total of 13 countries were involved in implementing the bio-behavioural survey including Sweden, United Kingdom, Belgium, Germany, Portugal, Spain, Italy, Bulgaria, Lithuania, Poland, Romania, Slovak Republic and Slovenia. Such diverse geographical coverage inevitably meant the existence of very different cultural and social contexts and thus the choice of methodology to be implemented, namely TLS (Belgium, Bulgaria, Germany, Poland, Portugal, Slovenia, Spain, Sweden, and the UK) or RDS (Italy, Lithuania, Romania, and the Slovak Republic) was dependent on the characteristics of the particular city in question.

Conclusions

Increases in HIV cases among MSM continue to be reported by the ECDC and in the wider international scientific literature. Effective interventions to monitor and control HIV epidemics among this specific target group remain a priority. In this process, it is imperative to gain reliable and comparable data on epidemic patterns within and between countries, as well as meaningful assessment, identification, and response to MSM prevention needs.

The Sialon II project has contributed significantly to the harmonisation of surveillance methods across participating countries and in doing so, has increased directly the public health response at country and European level. The comparable data on behavioural and epidemiological indicators for MSM communities (ECDC and GARPR indicators) presented in this report can be used at local, European, and international levels.

Through initial formative research, the project has identified unmet prevention needs and built community-based capacity to carry out research and prevention in venue-based settings. While the Sialon II prevention campaign was designed to take place in the context of the TLS and RDS data collection venues, implementation of prevention activities went beyond the data collection as such. Sialon II adopted a community-based, participatory approach throughout the whole project, which contributed to identify the shortcomings of existing prevention policies and measures, and strengthened a Europe-wide network of international (UNAIDS, WHO) and European institutions (European Commission, ECDC), National Institutes of Public Health, Universities, and civil society organisations (NGOs working with and for MSM).

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3. Methods

Summary

Two different probability sampling procedures were used to sample MSM for the Sialon II survey: Time-Location Sampling (TLS) and Respondent-Driven Sampling (RDS). The first procedure is based on venues where the target population congregates, whilst the second is based on a peer-to-peer recruitment process. Preliminary formative research was carried out as well as dedicated training for data collectors and lab staff. A questionnaire for collecting behavioural data was developed in line with the international indicators (ECDC, GARPR) and lab procedures were identified according to both local standards and WHO guidelines. Finally, specific sampling weights procedures were followed in line with the two methods adopted.

Introduction

In this Chapter, details of the sampling methods and procedures are provided for the Sialon II study. Specifically, a general introduction to TLS and RDS methods is presented including a brief consideration of their advantages and disadvantages. This chapter provides Information about formative research, the data collection locations, including selection of recruitment sites, and the study design, including the sample size, inclusion/exclusion criteria, tool development and implementation procedures. A description of the behavioural questionnaire and laboratory procedures conducted for the biological component of the survey are also presented. The Chapter ends with a detailed consideration of the data management and analytical procedures adopted, including the weighting systems.

Introduction to TLS and RDS methods

Two different probability sampling methods were used to sample MSM for the Sialon II survey: Time-Location Sampling (TLS) (Williamson, 2007; Stueve, 2001) and Respondent-Driven Sampling (RDS) (Heckathorn,

1997). According to the literature, these methods are considered effective in gathering representative samples of populations that are considered hard to reach or hidden (Montealegre, 2013; Malekinejad, 2008).

TLS approximates random cluster sampling whereby everyone attending the cluster (or venue) has an equal chance of inclusion but are sampled as a group. The basis for TLS is to construct a 'universe of venues' where the target population congregates and to select randomly the venue, day of the week, and time of day (venue-day-time [VDT] units) from this universe. Eligible persons from these units are then sampled randomly. Following data collection, data are analysed to adjust for any cluster effects. A complete venue universe serves as the sampling frame and is essential for TLS being considered (at least theoretically) as a probability sampling method. The venue universe is also a useful tool for understanding the geography and diversity of the target population.

Respondent Driven Sampling (RDS) is a chain-referral sampling method that incorporates numerous theoretical and analytical assumptions to provide representative estimates of the network of the population sampled. RDS recruitment begins with a set number of individuals or 'seeds', selected purposefully from the target population. Seeds are trained to recruit a set number of individuals from their social network of peers. The recruits of the seeds who enrol in an RDS survey are also trained to recruit a set number of individuals from their social network of peers. Seeds and recruited participants typically receive incentives in return for their participation (referred to as primary incentives) and for referring additional recruits (secondary incentives). Ideally, this process results in long recruitment chains made up of several 'waves' of recruits. As recruitment chains lengthen, the composition of the sample becomes less dependent on the purposefully selected seeds and the sample becomes increasingly similar to the population being sampled. RDS also involves a complex analytical component crucial for generating population estimates and confidence intervals using data collected about each participant's social network size and recruitment patterns.

Pros and cons of TLS and RDS methods

TLS is useful for recruiting MSM who attend different types of gay venues in a given city. The formative research stage of TLS is particularly important in the recruitment process as it allows the identification of all venues (locations) at which enough persons from the population of interest could be found on some day during a period of at least 4 hours to make recruitment feasible (Karon, 2012). However, TLS misses members of the target population (in this case MSM) who never or rarely attend venues. Therefore, estimates from TLS represent only 'visible' MSM, that is, MSM who are attending the gay scene (the venues that were selected through the formative research in each study site). TLS is prone to systematic bias when a complete and accurate universe of the venues cannot be created. This may be because sites change between the mapping and study initiation period (e.g. venues closing down or new ones opening), venue owners do not allow access, or venues are too hidden or dangerous to map. Implementing TLS requires resources to perform a comprehensive mapping of all venues as well as keeping accurate and thorough records of the enumeration and mapping process, and to conduct data collection at often unsociable hours.

RDS is one of the most widely used methods to sample the most hidden and hard to reach populations worldwide, including those who are not visible at venues (Montealegre, 2013). However, if the population of interest is not socially networked, other sampling methods should be considered. Compared to TLS, RDS is better suited for allowing researchers to collect blood and serum samples for testing because participants must enrol in the study at a fixed site. Having a fixed site also allows for the delivery of counselling and test results and fewer distractions for participants completing self-administered questionnaires. RDS is also useful for providing opportunities to deliver health promotion or HIV prevention interventions to participants (Latkin, 1999). As RDS relies on participants to recruit their peers, research staff are not required to engage with potential participants, thereby conceivably increasing accessibility to the study. Nevertheless, like TLS, RDS requires rigorous management by trained staff to collect data on who recruited whom and to measure each participant's social network size, both of which are essential to conducting data analysis. Some studies comparing RDS and TLS samples (Kendall, 2008; Zhao, 2014)

have shown that each method is prone to sample MSM from dissimilar segments of the population. For instance, RDS has been known to over-represent MSM subgroups that are younger and are from lower SES group (Sabin, 2014) and in the case of the SAILON II study, MSM sampled with RDS in Bucharest comprised a network of MSM who injected drugs and sold sex. This can result in different sample characteristics, and the differences may persist also after these data are weighted. It is, therefore, important to understand the underlying network structure of the population to clearly define the final denominator in the sample. As RDS is a network based sampling method, analysis is particularly complex and requires the use of open source software such as RDSAT (www.respondentdrivensampling.org) or RDS Analyst (www.hpmrg.org).

In conclusion, RDS is particularly useful for sampling more hidden segments of the MSM population, including those MSM who are not visible at venues. Both TLS and RDS may end up sampling different subsets of the total population of MSM. However, this is a minor limitation as long as the subset being sampled is known and described when presenting results. Although neither RDS nor TLS is perfect, they are the only probability based methods available for sampling hard to reach and hidden populations. For the Sialon II studies, the availability of TLS and RDS methods allowed for countries to adapt a rigorous sampling strategy based on the context of the region and the population profile of MSM.

Data collection locations

Data generated through TLS and RDS methods were collected in 13 EU countries: Belgium, Bulgaria, Germany, Italy, Lithuania, Poland, Portugal, Spain, Romania, Slovakia, Sweden, Slovenia, and the United Kingdom.

Table 3.1. Sampling method, country, city and associated and collaborating partners

Sampling method	Country	City	Associated and Collaborating partners
Time-Location Sampling	Belgium	Brussels	Institute of Tropical Medicine (Antwerp); Rainbow House(Brussels); Sensoa (Antwerp)
	Bulgaria	Sofia	NCIPD, National Reference Laboratory of HIV (Sofia); Association Health without Borders Bulgaria (Sofia)
	Germany	Hamburg	Robert Koch-Institute (Berlin); Hein&Fiete (local HIV-prevention agency in Hamburg)
	Poland	Warsaw	National Institute of Public Health – National Institute of Hygiene (Warsaw); Lambda Warsawa Association (Warsaw)
	Portugal	Lisbon	Instituto Higiene e Medicina Tropical (Lisbon); GAT (Lisbon)
	Slovenia	Ljubljana	National Institute of Public Health (Ljubljana); SKUC Magnus (Ljubljana)
	Spain	Barcelona	Centre d'Estudis Epidemiològics sobre la Sida de Catalunya - CEEISCAT (Barcelona); STOP SIDA (Barcelona)
	Sweden	Stockholm	Swedish Institute for Communicable Disease Control (Stockholm)
	UK	Brighton	Centre for Health Research, University of Brighton (Brighton); Terrence Higgins Trust (Brighton)
Respondent-Driven Sampling	Italy	Verona	Azienda Universitaria Ospedaliera Integrata, Regione Veneto (Verona); Istituto Superiore di Sanità (Rome); Arcigay – Italian LGBT Association (Bologna – Verona)
	Lithuania	Vilnius	Centre for Communicable Diseases and AIDS (Vilnius)
	Slovakia	Bratislava	Slovak Medical University (Bratislava)
	Romania	Bucharest	National Institute of Infectious Diseases "M Bals" (Bucharest); ACCEPT (Bucharest); ARAS (Bucharest)

The bio-behavioural survey was implemented using TLS in nine countries (Belgium, Bulgaria, Germany, Poland, Portugal, Spain, Sweden, Slovenia, and United Kingdom) and RDS was implemented in four countries (Italy, Lithuania, Romania, and Slovakia). The institutions involved in Sialon II included those also involved in Sialon I as well as additional institutions and are listed in Table 3.1.

With the collaboration of UNAIDS and WHO, the procedures (protocols, UNGASS / GARPR / ECDC indicators, epidemiological algorithms) and prevention strategies developed in the context of the Sialon II studies. These materials were also shared in Armenia and Moldova who chose not to undertake the Sialon II study since they were conducting national biological and behavioural surveillance studies of MSM.

Formative Research

Formative research, conducted in each participating country, involved representatives from the gay communities in each city and key informants. For both TLS and RDS, formative research was used primarily to provide a comprehensive 'picture' of each study area, including demographic characteristics, the proportion of MSM among the adult male population, the degree of 'outness' reported by MSM in the study area, self-reported internalised homonegativity, gay-venue attendance, and self-reported HIV and STI history. For TLS, formative research involved identifying and mapping MSM venues and time segments and attendance at those venues, creating an initial 'universe' of venues, exploring and anticipating safety issues for fieldwork, and developing relationships with venue owners to secure their participation. For RDS, formative research involved identifying the underlying structure of MSM networks and selecting appropriate study sites (e.g. easy for MSM to find, quiet, private, safe, and comfortable).

In line with the approach adopted to conduct the formative research, specific activities were foreseen, such as media reviews, interviews, observation, enumeration data, and gathering logistical characteristics. When necessary, key informant interviews were conducted with MSM researchers, health providers, venue owners or managers and staff of community-based organisations and commercial and social venues.

Selection of study sites: TLS

During the formative research phase, TLS research teams met with venue owners or managers to solicit their approval to conduct the survey on their property. If an owner was unable to provide sufficient information regarding attendance patterns for a specific venue (e.g. at cruising settings), with their permission, a member of the research team attended the venue in order to count and characterise MSM in attendance. A list of gay venues was therefore established in each city participating in the study.

Information about the different study sites was collected via a combination of a dedicated questionnaire and access to secondary data from the European MSM Internet Survey (EMIS) (The EMIS Network, 2013). The questionnaires were completed by each project partner from the respective study country in partnership with their local collaborating partner (e.g. NGO). Each questionnaire explored a number of areas such as: the proposed study site; previous experiences with different study methodologies and target groups; data on gay-friendly commercial and non-commercial sites; testing opportunities, regulations, and treatment guidelines for HIV, STIs, HBV, and HCV; legislation relating to gay issues (e.g. date of homosexuality being legal, possibility of gay marriage or officially recognised civil partnerships, protection from discrimination regarding sexual orientation etc.) and; stigmatisation.

For the universe of venues to be identified, the questionnaire was divided into different sections for collecting information on: who attends the venues; MSM patterns of attendance during specific days and times; special events including frequency (e.g. parties, parades); proportion of MSM among venue attendees, safety issues, owner's agreement to participate, logistical characteristics, and other useful contextual information. Together, these data were used to estimate the number and proportion of eligible MSM who attended VDTs.

Any commercial or non-commercial location attended by MSM could be included as a venue in the universe.

One exception were venues that specifically served HIV-positive members of the target population given including these types of venues would artificially increase the representation of HIV-positive individuals in the final sample.

Venues considered eligible were (if available) commercial (cafés, discos/clubs, bars, sex shops, sex clubs, sex cinemas, and saunas) and non-commercial (cruising settings, gay community centres, gay pride events, and other special events). Once an initial list of venues had been established through the formative research process, MSM venues and VDT units were then defined. This process was completed approximately two months before data collection by the respective country TLS researcher in partnership with a specified field coordinator from their local gay NGO.

Selection of study sites: RDS

RDS study sites were selected based on various criteria such as being accessible (easy to find), quiet and private (confidential), safe (both for research staff and participants, especially in terms of collecting biological specimens), and comfortable. In order to guarantee safety and confidentiality, study site locations were selected through the involvement of the local gay communities in each participating city and in partnership with the local health services.

Members of the RDS research team ensured participants were eligible, felt relaxed and comfortable, and understood and consented to the survey process. Researchers used feedback from participants to identify and evaluate necessary improvements to the data collection process. This feedback loop helped in securing the enrolment of other participants recruited by peers. All RDS researchers received substantial training to collect data and on how to implement the concurrent interactive prevention activities (e.g. distribution of information packs containing condoms and lubricant, and relevant information leaflets).

Study design

The Sialon II studies are cross-sectional studies. For TLS, a three-stage sampling design was adopted including the random sampling of venues, venue-day-time locations (VDT), and participants (individuals). For RDS, a multi-centre biological and behavioural cross-sectional design was adopted.

Sample size calculation

TLS and RDS sample sizes were calculated using an estimated HIV prevalence of 15%, which is one of the higher estimates among those observed in the former Sialon I study. In addition, a confidence level of 95%, a precision of 5% and a design effect of 2 (to account for the sampling method not being a traditional random sample) were used to calculate a final sample size of 392, rounded up to 400 at each site. A sample size of 400 was assessed as being sufficient in order to allow an estimation of HIV prevalence with a 95% confidence interval of +/- 5% if the prevalence is 15%. According to preliminary available data, in many countries the prevalence was likely to be lower, with the consequence that the estimate would have had an even broader confidence interval and thus a larger sample size would have been required. Based on experiences of using TLS in the Sialon I study, it was estimated that approximately 50% of the persons approached to participate in the study would refuse to take part. This means that in each city, data collectors would have to approach around 800 people in order to collect data for 400.

Inclusion and exclusion criteria

The inclusion criteria included male participants who:

- Had any kind of sex (penetrative or not) at least once with a man during the last 12 months;
- Were 18 year and older;

- Provided anonymous informed consent to take part in the study;
- Agreed to answer the study questionnaire;
- Agreed to donate an oral fluid sample (TLS);
- Agreed to donate a blood sample (RDS);
- Had a valid coupon (except for the seeds in RDS).

Exclusion criteria were defined as follows:

- Having already participated in the study;
- Not having a coupon (RDS).

Tools development

Several different research tools were developed specific to TLS and RDS. All tools were developed in collaboration with the partner NGOs in order to ensure that they were locally relevant, informed by gay communities, and could assist in ensuring data collection uniformity. These main tools were:

- A training module for TLS and RDS research teams;
- A prevention and training manual (including findings from the formative research);
- A training module for laboratory technicians on virological procedures;
- A behavioural questionnaire;
- An HIV/STI prevention package.

Training module for TLS and RDS research teams

The training module included two different training and data collection tools according to the TLS and RDS method.

The TLS module included ten core components as follows:

1. **TLS sampling manual** for detailing the sampling procedures and on how the sample frames are constructed. Two specific forms were provided to assist the completion of the first and second sampling frames;
2. **TLS data collection manual** describing how to collect bio-behavioural data from participants through gay venues according using TLS methods;
3. **VDT form** for data collectors to summarise the number of collections assigned to every pair of data collectors according to the sampling plan;
4. **A record form** to record the unique barcodes from questionnaires along with the name of the data collector, specific VDT, and date of collection;
5. **Oral-fluid sample delivery receipt** to manage the delivery procedure of the samples from the data collectors to the laboratory;
6. **Informed consent form** to be signed by the participant in order to formalise consent to participate in the study;
7. **Participant information sheet** for participants to keep, setting out the study's aims and procedures, ethical considerations, issues and participant's rights (e.g. right to withdraw, data protection etc.);
8. **Interactive HIV/STI prevention card** including separate barcode: A graphically designed card to be given to participants which included a unique barcode necessary to collect personal test results, and a detachable card with an interactive HIV/STI prevention activity to assess the prevention knowledge level of the participant and stimulate a prevention conversation with the data collector;
9. **Refusal form** on which refusals to participate were recorded along with basic contextual information (e.g. approximate age, reason for refusal if offered etc.);

10. **Questionnaire manual** used as guidance for data collectors when administering the behavioural part of the survey.

The RDS module included eight core components as follows:

1. **RDS data collection manual** describing how to collect bio-behavioural data from participants according using RDS methods;
2. **RDS software package** for the automatic generation and printing of individualised materials (e.g. coupons, result card, barcoded questionnaires, etc.) for each participant as well as the generation of RDS record (excel) files;
3. **Informed consent form** to be signed by the participant in order to formalise consent to participate in the study;
4. **Participant information sheet** for participants to keep regarding the study's aims and procedures, ethical considerations, issues and participant's rights (e.g. right to withdraw, data protection etc);
5. **RDS interview questionnaire/grid** with specific items on the respondent's network structure and relationships (personal network size, number of peers who the respondent knows personally in a specific period of time etc.). An additional item measured the relationship between the participant and his recruiter. As an improvement of the RDS methodology, respondents were also requested to indicate the last four figures of each potential peer's mobile number, with their first initial. This helped to map the social network more precisely, even if anonymously, allowing a detailed re-construction of the participant's personal network;
6. **Recruitment coupons** (3+1) consisting of three coupons to be given to three other possible participants by the recruited person and one coupon (voucher) for the collection of the secondary incentive;
7. **Result card** (coupon-voucher) for the collection of an individual's test results;
8. **RDS follow up questionnaire/grid** measuring the recruitment process in the participant chain.

Prevention and Training Manual

The prevention and training manual included two core components:

1. **Formative research report** with information on the study sites in each country including prevention issues highlighted through EMIS data;
2. **Prevention training manual** which included the underpinning conceptual base of the prevention activities, namely, the minority stress model (Meyer, 2005) and the information-motivation-behavioural skills model (Fisher and Fisher, 1992) for the training of the data collectors in prevention, especially for the TLS part, and the guidelines for the use of the Sialon II information packs and the interactive prevention card.

Training module for laboratory technicians

This tool provided guidelines for the laboratory technicians involved in the analysis of the biological samples for TLS and RDS. Detailed information on the laboratory procedures to be followed for testing oral fluid as well as testing on blood were provided.

Behavioural questionnaire

The Sialon II behavioural questionnaire was developed by building on existing (and already standardised) questionnaires from two previous EU-funded projects, namely Sialon I and EMIS. In line with the UNGASS-GARPR and ECDC behavioural indicators, the Sialon II questionnaire was designed to elicit a range of behavioural and socio-ecological data including: prevention needs; sexual behaviours; service access; socio-ecological aspects of the environment; risk behaviours; HIV testing in the last 12 months; proportions of MSM reached through HIV

prevention programmes; condom use at last anal sex, and; estimates of HIV infection. In addition, the questionnaire was also designed to include specific items on sexual health and well-being based on recent recommendations from the WHO (WHO, 2010). These items included sexual satisfaction (TLS and RDS), and safety and autonomy (RDS only).

In order to have a shared and participatory process in designing the questionnaire, the draft version was distributed among partners (including partner NGOs) for comments and amendments. The final version of the questionnaire was translated into national languages, back-translated and then piloted. As noted above, a companion questionnaire manual was also developed in order to guide data collectors during implementation and increase uniformity in procedures with a view to guaranteeing uniformity in data collection across the different cities. The manual was a core component of the training module for data collectors.

Laboratory procedures

Laboratory testing guidelines were developed taking into account both the international 'gold-standards' for HIV and STI testing and the local laboratory procedures in each participating country, as well as the WHO-STI surveillance guidelines.

With regards to the TLS survey, oral fluids (OF) were collected using Oral Specimen Collection Devices (ORACOLE) or swabs at room temperature in gay venues. Each plastic tube containing an OF specimen was labelled with the same unique barcode as the questionnaire of each participant. After collection, OF were stored between 4°C-8°C and transported at room temperature to the laboratory within 72 hours of collection. On receipt by the testing laboratory, tubes containing the swab were filled with 1.0 ml of recovering buffer and vortexed for 20 seconds.

Swabs were then removed from the tubes, squeezing and twisting the sponge against the plastic wall, inverted and placed back inside the tube. Tubes were capped and centrifuged at 805g for 5 minutes at room temperature to extract the OF. OF was then transferred to a sterile microfuge tube (Sarstedt, Numbrecht, Germany) and stored at -20° C until needed for testing.

The quality of the HIV-negative oral fluid samples was established by measuring total IgG using Human IgG ELISA kit (Immunology Consultants Laboratory, Inc.). Before testing, each sample was diluted 1/250 with the buffer provided in the IgG kit. The negative samples with IgG concentration < 3.5 mg/L were considered invalid and excluded from the study.

Anonymous and confidential testing of HIV-antibodies from OF was conducted following the testing strategy recommended by the WHO (WHO, 2009) using commercial available diagnostic kits: Genscreen HIV ½ version 2 (BIO-RAD) and Vironostika HIV Ag/Ab (Biomerieux). Usage of both of these kits was done according to standard diagnostic procedures with the exception of Vironostika when a double sample volume of oral fluid sample (100 µl) was used comparing to serum. According to the research protocol, where an OF sample was HIV-reactive in one or both tests, participants (if they collected their results using their unique barcode) were provided with post-test counselling, and encouraged to re-test on blood via usual care pathways in their city of residence.

With regards to the RDS component, blood samples were collected according to standard procedures. As with TLS, each plastic tube containing a specimen was labelled with the same unique barcode as the questionnaire of each participant. Each sample was then tested for HIV, HBV, HCV and Treponema pallidum infection. Anonymous and confidential testing of HIV infection on blood was conducted following WHO guidelines on testing (WHO, 2007, 2009). Serum samples were tested with commercial EC marked 4th generation ELISA tests. An HIV positive sero-status was based upon the outcome of two or more tests relying on different antigens or of different operating characteristics for newly diagnosed individuals. A positive result was confirmed on a second sample using Western Blot. In each site 200 µL of serum were collected for every individual confirmed positive for HIV antibodies, stored at –20°C and were shipped to a central laboratory under refrigerated conditions for Avidity Index calculations. Participants with HIV-positive results were counselled and referred into local care systems for further management of their HIV status.

Data management and analysis

For data generated through TLS and RDS, a data entry tool was developed and piloted using the EpiData software (EpiData Data Entry, Data Management and basic Statistical Analysis System. 2000-2008). The specific data entry template was adapted to the precise questionnaire format of the country in question (e.g. in terms of the precise order of questions, any extra questions, coding etc.). Each Sialon II partner received two data entry templates; one for the laboratory and questionnaire data, and one for the refusal form. Extensive instructions on the whole data entering process were provided.

All datasets were controlled and quality checked locally by project partners. Up to 10% of the total sample was double entered. All databases as well as double entry outputs were further cross-checked and then merged to form a common (TLS+RDS) dataset for analysis.

Data management was carried out using DataEntry and R (v.13.1 and v.14.0). Additional cross-checks were performed with Stata. Data analysis was carried out using R (v3.1.0), Stata and SPSS. TLS estimates (including GARPR indicators) were calculated as proportions. Confidence intervals were calculated using the Normal approximation applying a Wald type formula i.e. the mean ± 1.96*standard error. In cases where a confidence interval limit went below 0% or above 100%, these were set to 0% or 100%. For RDS, estimates were weighted using the successive sampling estimate in RDS Analyst (www.hpmrg.org).

Weighting systems

For the TLS survey data, incidence and proportion estimates were weighted and corrected using the methods described by Karon and Wejnert (Karon, 2012). Estimates were adjusted in three different ways simultaneously by taking into consideration: the design effect due to clustering of participants at the venue, and; the individual participant's sampling weight.

Design effect (DE) quantifies the departure from a simple random sample design. DE was incorporated into the calculation of the standard error (SE) which assumed a simple random sample. The location (venue) was defined as the unit of clustering. A DE of one indicates that the sample was equivalent to a simple random sample, while a DE above one indicates clustering. In the cases where the DE is below one, the conclusion is that the sample was more efficient than a simple random sample. Where all or none of the participants were included in the numerator of the indicator (i.e. percentage equal to 0% or 100%), the DE was not possible to calculate.

Each TLS participant's individual weight was calculated as the inverse of the product of three probabilities based on: the length of time of the time-location event; the number of sampled individuals during the event in relation to the estimated number of visitors during the sampling event, and; the participant's frequency of attendance in the last three months at the particular venue where the participant was sampled.

Due to many missing values in the variables on attendance at the specific venue, it was not possible to calculate directly the TLS sampling weight. Therefore an imputation was carried out for this variable using the method of chained equations, also known as the MICE method (van Buren, 2011). Predictors included the following: age, city of study, country of birth (study country or not), country of residence (study country or not), visitor or local resident, HIV status according to saliva test result, number of visits to the venue in the last 3 months, and number of visits to venue type in the last 3 months. Ten rounds of imputations were conducted, and the median value of those was then calculated. The ceiling (i.e. rounding up to the next whole number) of the number of imputed visits was then used in the cases were the number of visits had not been given by the participant.

For RDS, data were weighted using the without replacement successive sampling estimator (Gile, 2010). This weighting procedure uses information about the recruitment patterns and each participant's social network size to account for biases normally found in chain referral sampling methods.

Limitations

The methodology adopted for the Sialon II study, from data collection to data analysis, incorporated the most advanced approaches in implementing bio-behavioural surveys, in line with the indications in scientific literature and international guidelines from ECDC, UNAIDS and WHO (UNAIDS/WHO, 2002; UNAIDS/WHO, 2000; Johnston, 2013). However, in certain specific cases, the Sialon II survey methods and related findings present some limitations. Such limitations are related either to the sampling methodology and tools adopted or to the characteristics of the data that are analysed and described in the present report.

Sampling methods

One limitation of the Sialon II methodology related to the sampling methods adopted in the study. As already noted, subsets of the population may have been sampled depending on the sampling method used which may not represent the entire MSM population (Kendall, 2008; Zhao, 2014). For RDS, we know that some surveys have missed younger or older or MSM of particular socio-economic status. For TLS, we know that portions of the population that are not visible are missed. How these groups differ from the entire population is not known without further qualitative research.

TLS is extremely useful for recruiting MSM who can be measured based on their attendance at different types of gay venues in a given city. As long as a thorough and complete mapping of all venues is conducted, the TLS sample should represent those MSM who are visible at these venues, which in many cities may be most MSM. In fact, it is assumed that MSM present in each specific VDT have an equal or somehow known chance of being enrolled in the study. In addition, it is assumed that a complete map of the VDT units is available in the selected sites and venues in the given city (refer to the Formative Research section). In any case, because of such assumptions, MSM who never or rarely attend the gay scene (selected venues) are *de facto* excluded from the study.

RDS is particularly useful for recruiting more hidden and non-visible MSM. However, because RDS samples a network, failure to understand the parameters of that network may result in biased estimations when important subgroups are excluded from the sample. A thorough formative assessment of the population networks and strategic selection of seeds can reduce the chances that important subpopulations are missed in the sampling.

RDS relies on two different levels of assumptions: functional and analytical. Functional assumptions are that MSM (i) should know one another as members of the survey population, and (ii) should be connected by a network composed of a single component. Analytical assumptions are that (i) MSM enrolled in the survey can accurately assess the number of other MSM (in line with the inclusion criteria) in their personal network size; (ii) the recruitment of other participants from the recruiter's network is performed randomly (Volz, 2008; Heckathorn, 2007).

Tools

The use of different sampling methods impacts the questionnaire development and administration procedures. Due to the characteristics of the participants' enrolment process through both the RDS and TLS surveys, two versions of the Sialon II questionnaire were developed. In both versions, the main core items were included, but due to practical constraints of data collection at the TLS venues – which required a shorter questionnaire – specific additional questions (e.g., commercial sex, detailed information on sex with female partners, etc.) were excluded. In many cases, the use of an explicit slang expression for items focusing on specific sexual behaviours was deliberate to disambiguate the question and avoid potential misunderstanding. Despite this, some items in the questionnaire could have been misinterpreted by some respondents. To limit questionnaire bias, the questionnaire was designed through a participatory process and the draft version was distributed among partners (including partner NGOs) for comments and amendments. The final version of the questionnaire was translated into national languages, back-translated and then piloted. In addition, a companion questionnaire

manual was also developed in order to guide data collectors during implementation and increase uniformity in procedures across the different cities. Piloting of items and procedures was carried out in order to ensure understanding of the questions and uniformity of the data collection process. In addition, the Sialon II questionnaires incorporated the main international indicators for bio-behavioural surveys, in line with the WHO and ECDC recommendations (UNAIDS/WHO, 2002; WHO, 2010; UNAIDS/WHO working group on global HIV/AIDS and STI surveillance, 2011; UNAIDS, 2008).

Sample composition

The sample compositions differed in some countries. For instance, the proportion of study participants younger than 25 years was larger in Central/Eastern European cities than in Western European study sites. In very specific cases, the precision of the estimate for the younger age group is questionable as the sample sizes were relatively small (<50). This is most likely explained by the different age structure of the MSM population approachable by surveillance studies across different cities. It does probably not reflect a more difficult access to young MSM in Western Europe, but rather a more difficult access to older MSM in Central/Eastern Europe sites. Older MSM in Central/Eastern Europe have grown up in a much more homophobic environment with a lack of gay infrastructure like commercial and non-commercial gay venues. Some of the differences in the GARPR indicators could be associated with these age differences, and also with the different time-points of onset of the HIV epidemic among MSM.

In some cases confidence intervals are relatively wide and with small sample sizes for some cities, variable estimates must therefore be interpreted cautiously. For instance, stratification by age was not possible for certain variables due to the low numbers of participants who declared engaging in specific sexual behaviour (e.g. commercial sex activities).

A closer look at behavioural variables in different TLS cities and a comparison with the samples from the same study areas in the EMIS survey (The EMIS Network, 2013) suggests that different segments of the total MSM population were reached in the gay venues which were selected for the recruitment of study participants. For example, gay bars/cafes where gay couples go out for socialising rather than for seeking sex partners are less present in the Central/Eastern European cities than in the Western European cities. This may affect the composition of the relatively small younger age groups (<25 years) in Western European cities, but may also affect the sample from Sofia. While the high self-reported testing rates and scores for the 'having been reached by prevention' indicator are indicative of the good work of the NGO which recruited the participants for the study, this sample is probably less representative for the general MSM population of the study city/country as compared to the TLS samples from other cities.

Another aspect is the inclusion of tourists from other countries and nationals not residing in the study city in the samples. The proportion of tourists varies considerably between TLS cities, and tourists are nearly absent in the RDS samples. However, since the weighting procedure was based on the frequency of venue visits (less frequent visits are associated with higher weights), tourists may get disproportional high weights which may bias weighted estimates according to the proportion of tourists.

Comparability and generalisability of the samples

In line with the methodology adopted in this multi-centre bio-behavioural cross-sectional design, survey results cannot be compared across the different study sites (as this was not the purpose of this multi-site project), and the generalisation of the estimates to the overall MSM population might be problematic.

Findings based on the data collected though TLS can be generalised only to the population of MSM attending the gay scene in the given study site. Similarly, estimates based on the RDS data can be generalised to the network of MSM who live, work or socialise in the given study city area, in line with the inclusion criteria. Data related to RDS surveys refer to networks (and not to individuals) recruited through the survey: this could lead to the exclusion of some potential hidden sub-populations that are not well connected with the larger network of MSM.

In line with this approach, data are considered, analysed and presented separately, for each study site, without grouping or comparing different cities estimates.

In some Sections (e.g. those focusing on sexual behaviours), TLS and RDS datasets were combined to present aggregated data in circumstances where actual numbers were particularly low, although this detours from the strict statistical and epidemiological assumptions behind the Sialon II study. Nevertheless, as long as these results are interpreted with caution, combining the datasets offers additional insight into the characteristics and behaviours of MSM which may be useful in developing future prevention actions.

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4. Ethical considerations

Summary

Due to the potential sensitivity of a bio-behavioural survey on MSM institutions and gay communities in each country were involved in the project from the outset informing all aspects of the project planning, development, implementation, and evaluation. Additional stakeholders and experts were also involved technically and to advise on ethical issues related to the study protocols (e.g. the WHO and ECDC). In parallel to the partner institutional review process, the Sialon II protocols were also submitted to and approved by the WHO Research Project Review Panel (RP2) and to the WHO Research Ethics Review Committee (WHO-ERC).

In line with the principles of anonymity and confidentiality, a specific barcode system was adopted to facilitate linkage between an individual's biological sample and their behavioural survey responses.

Considerable care was taken in the preparation of all project documentation and dissemination materials to minimise the potential for misuse or misinterpretation of survey findings.

Introduction

In this Chapter, details are provided of some of the key ethical considerations addressed in the Sialon II project. Given the complexity of the research design, attention is paid to a number of different ethical issues relating to recruitment, informed consent, data storage, vulnerability of the study participants and compensation, liability for data collectors, and access to treatment and/or counselling. Towards the end of the Chapter, issues relating to the environmental impact of the project, monitoring of the survey, and dissemination of the project's results are outlined.

Overview of ethical considerations

The Sialon II survey collected biological samples and linked behavioural information from MSM through complex procedures across 13 different European countries. Such a large-scale undertaking in countries with

sometimes quite different national regulations regarding ethical and governance issues (e.g. relating to privacy, confidentiality, and informed consent rules) raised a number of both specific and more general challenges. Consequently, very specific and clear ethical and governance procedures were required in order to comply with all local, national, and European guidance on ethical and legal conduct in research with human participants, as well as to minimise the risks of mistakes (including potential diagnostic mistakes).

In general, conducting bio-behavioural surveys on sensitive topics such as sexual orientation, sexual behaviours, and HIV/STI status can be problematic in that any data or findings can potentially be misused or misinterpreted reinforcing MSM related stigma and discrimination. Consequently, as noted in Chapters 2 and 3, gay communities in each country were involved in the project from the outset informing all aspects of the project. Additional stakeholders and experts were also involved technically and to advise on ethical issues (e.g. the WHO and ECDC). The Sialon II study protocols were submitted to the local ethics committee (and sometimes governance committee depending on requirements) in each participating city by the relevant project partner. In all sites, full ethical approval was gained prior to the commencement of any data collection activities.

In parallel to the partner institutional review process, the Sialon II protocols were also submitted to the WHO Research Project Review Panel (RP2). RP2 is tasked with providing a review for research projects protocols, particularly on the technical and methodological components of the survey. The RP2 committee analysed the protocols ensuring the rigorous quality of both procedural and methodological issues related to the entire survey process. Following feedback and fine tuning, the final Sialon II protocols were approved in 2012.

As an additional step, the RP2 approved protocols were also submitted in 2013 to the WHO Research Ethics Review Committee (WHO-ERC). The WHO-ERC is an international ethics committee in charge of evaluating and setting high quality and ethical standards in all research supported by the WHO. The WHO-ERC acts in accordance with the World Medical Association's Declaration of Helsinki on Ethical Principles for Medical Research Involving Human Subjects [*sic*] (World Medical Association Declaration of Helsinki, adopted by the 18th WMA General Assembly, Helsinki, Finland, June 1964 and amended by the 59th WMA General Assembly, Seoul, October 2008), the International Ethical Guidelines for Biomedical Research Involving Human Subjects [*sic*] (Council for International Organizations of Medical Sciences (CIOMS), 2002) as well as the International Guidelines for Ethical Review of Epidemiological Studies (Council for International Organizations of Medical Sciences (CIOMS), 2009). The Sialon II protocols were approved by the WHO-ERC in February 2013, and thus became a WHO collaborating study. Consequently, periodical monitoring reports on the status of the survey implementation were prepared and submitted regularly to the WHO-ERC committee for review and approval.

A detailed description of some of the key ethical issues in the project is reported in the following sections.

Ethical issues in recruitment, gaining informed consent, and data storage

Recruitment and informed consent

The Sialon II survey adhered vociferously to principles of anonymity and confidentiality for participants throughout the research process. For instance, to adhere to these principles and comply with all ethical and legal obligations, in TLS and RDS recruitment and for the entire data collection process, the name of the participant was not collected at any time. Instead to facilitate linkage between an individual's biological sample and their behavioural survey responses (as well as other documents), a barcode system was developed. Barcodes were unique to each participant and attached adhesively to the biological collection device, the behavioural questionnaire, informed consent form, and interactive prevention card with an additional detachable card to allow participants to collect their results anonymously.

To gain informed consent, a precise and staged-consent process was developed to ensure that participants had the opportunity to participate anonymously (or refuse participation without explanation), to understand fully any risk to participation, the limitations to the project and testing procedures (e.g. highlighting the project was

primarily for surveillance rather than diagnostic purposes), and to guarantee the right to withdraw consent at any time.

During data collection, members of the research team approached potential participants and offered them prevention materials as means of engagement and as an HIV prevention outreach activity. If initial verbal consent to proceed was received, participants were then offered a detailed participant information sheet (PIS). The PIS included a description of the project, provided information on what participation entailed, as well as explained issues of confidentiality, anonymity, and how to find out more information about the project even after the data collection was complete. If at this point participants were willing to proceed and understood what that meant, they were asked by the researcher to complete a consent form. As a further measure to secure the protection of an individual's anonymity, the consent forms allowed participants to simply make a mark (such as a cross) rather than provide a potentially identifiable signature. At the end of the data collection process, consent was checked again by the researcher to ensure participants were still happy for their data to be used.

Although Sialon II is an epidemiological project, ethically participants should nevertheless be able to receive their test results. Thus, results from the TLS arm of the study were made available to participants approximately one week after the date of the sample collection. Using the unique barcode given to them during data collection, participants were able to receive their result in person and receive post-test counselling if desired. In compliance with ethical protocols and to minimise the impact of any potential diagnostic mistakes, respondents who requested their result were informed that they were not diagnostic and that they should be tested again with another test performed on serum according to WHO/UNAIDS and/or national algorithms for HIV testing.

Additional testing for Syphilis, HBV and HCV were offered where possible depending on the city in question. Information on where to access such additional tests or medical checks using local health care service provision was always provided. For instances of HIV-positive cases, in each country a referral system was agreed locally to ensure (i) additional testing for confirmation if needed, (ii) prompt treatment, and; (iii) follow-up sessions. Furthermore, the availability of ARV treatment for those diagnosed HIV-positive was guaranteed as well the management of concomitant infections. In case a participant decided to reject the offer of confirmatory testing, he was invited to sign a specific consent form to attest this.

Data storage procedures

All biological samples were stored according to the study protocols before being shipped to the respective laboratories. Any samples without a 'signed' informed consent form were not sent for testing and destroyed. With regard to the behavioural data, paper copies of the completed questionnaires and related forms (e.g. consent forms, refusal forms etc.) were kept by project partners in locked filing cabinets in appropriately secured rooms. In terms of data entry, security of data was controlled by having password protected access to project computer files. Specific procedures were in place during data entry to prevent loss of data due to technical difficulties. Supervision of the entire process was provided and assured by the partner responsible at local level.

Ethical issues regarding vulnerability of the study participants

The vulnerability of participants in Sialon II related mainly to privacy issues given that involuntary disclosure of personal information and/or a HIV status can lead to stigmatisation and discrimination.

With regards to the TLS data collection, participants were approached in environments chosen by them (e.g. venues such as saunas, bars etc.) meaning that the issue of privacy was generally already addressed. As far as the RDS survey was concerned, participants were approached by their peers (i.e. other MSM) through existing social contacts who were themselves well aware of issues relating to privacy. However, to ensure all researchers (TLS) and peers (RDS) involved in data collection understood the need to protect participant's privacy, specific in-person training on this issue was delivered prior to data collection being conducted.

Ethical issues regarding data collectors

Issues of personal safety for researchers conducting data collection in TLS and RDS were anticipated and addressed during project planning (e.g. via development of a training manual for data collectors which included safety issues), formative research (e.g. identifying potential 'unsafe' data collection environments during mapping), and through ethical and governance approval processes. Exact regulations regarding risk assessments, insurance coverage, and liabilities differed from country to country but were assessed, monitored, and overseen as appropriate by the local project partner.

Ethical issues regarding compensation to study participants

No form of reimbursement or compensation for TLS participants was foreseen. However, according to the literature concerning implementation of the RDS method (Semaan, 2009), a participant should be compensated for the time and work involved in the recruitment of his peers. Consequently, for RDS two incentives were foreseen for each participant: a primary incentive for taking part in the first instance, and; a secondary incentive representing simple remuneration for recruiting additional peers to participate. The amounts and type of compensation for RDS participants for each study site were determined according to the results of the formative research.

Ethical issues in access to treatment and/or counselling

All testing was entirely voluntary following initial discussions with the participant and their receipt of a PIS, followed by receipt by the researcher of a signed (mark or signature) informed consent form. As noted earlier in this chapter, TLS and RDS participants were able to receive their result in person and receive post-test counselling. In compliance with the approved ethical protocols, respondents who requested their result were informed that they were not diagnostic and that they should be tested again with another test performed on serum. Furthermore, as also noted previously, additional tests for STIs were offered where possible. In TLS and RDS for instances of HIV-positive cases, referral systems were agreed with local health care providers.

Ethical issues regarding the environmental impact of the project

All survey partners involved in TLS and RDS testing took responsibility for collecting and disposing of the packaging of the tests in line with local standard guidelines. Moreover, all prevention materials (e.g. information pack, PIS etc.) were distributed during the data collection process in quantities that were appropriate for the expected number of attendees to avoid unnecessary waste of resources. Any left-over condom and lubricants following the end of data collection were donated to the local gay NGO for onward distribution to MSM as part of their normal outreach activities. Finally, in laboratories and in clinical settings, appropriate local procedures for the disposal of medical devices (e.g. syringes) were followed.

Ethical issues in monitoring of the survey

During the implementation of the Sialon II survey, the study protocols including ethical procedures were monitored regularly and in line with the project Grant Agreement and the ethical approvals received, namely the WHO RP2 and WHO-ERC, and individual partner institutional approvals. This process was overseen by the Sialon II project coordinators (Azienda Ospedaliera Universitaria Integrata Verona [AOUI-VR]) in collaboration with the leaders of the work packages relating to the TLS survey (Fundació Institut d'Investigació en Ciències de

la Salut Germans Trias I Pujol [IGTIP]) and the RDS survey (AOUI-VR, Verona, Italy).

For the duration of the data collection, email exchanges were held on a regular basis in order to cross-check whether all the procedures stated in the Sialon II master protocol were being followed appropriately by all the project network partners. Regular network telephone conferences (TCs) with all partners were also held for additional discussions and assessments, in addition to other ad-hoc TCs according to the specific needs of partners. If needed, site visits were conducted by members of the project coordination team to support partners and monitor implementation fidelity of the application of the survey protocols. Together, these actions were planned and delivered to minimise the potential for any deviations from the correct implementation of the survey. In addition to these control checks, regular monitoring reports (or 'memorandums') which included periodical updates on the status of the data collection were submitted to and approved by the WHO-ERC within the overall oversight provided by the ERC.

Ethical issues in dissemination of the project results

Considerable care was taken in the preparation of all project documentation and dissemination materials to minimise the potential for misuse or misinterpretation of survey findings. As discussed in earlier Chapters, gay communities across the participating countries were involved in the project from the outset and were also an active part of the dissemination process. In order to ensure the involvement of gay communities in dissemination as well as the whole survey process, two specific meetings were organised. The Sialon II meeting in Berlin (February, 2013) was planned in order to cross-validate all the data collection procedures and tools both in TLS and RDS. Representatives from gay NGOs in the different partner countries were able to not only contribute directly to the Sialon II procedural debates (e.g. regarding process and implementation of the survey helping to ensure both feasibility and acceptability by gay communities), but also to participate actively in the fine-tuning of the project materials and manuals for the impending data collection.

The Sialon II Antwerp meeting (September, 2014) was organised with the specific purpose of disseminating and discussing preliminary Sialon II survey results as a basis for strengthening HIV prevention efforts among heterogeneous MSM communities in Europe. Moreover, the meeting aimed to provide a space to reflect on how gay communities may disseminate and use the scientific results in future prevention practice (i.e. valorisation of the Sialon II findings). Interactive workshop sessions were conducted to discuss with scientific experts and NGO representatives the community needs for communication of Sialon II evidence. Experiences of dissemination were shared, as well as discussions of ways in which dissemination channels could be used to bring the Sialon II data to a broader audience whilst in the process, reducing the risk of any misuse or misinterpretations of survey findings.

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5. Survey results

Summary

The methodology adopted for the Sialon II project, from data collection to data analysis, incorporated the most advanced approaches in implementing bio-behavioural surveys. A key limitation however relates to the sampling methods adopted (TLS and RDS) both of which incorporate potential biases in enrolling members of the target population. Consequently, results cannot necessarily be compared easily across the different study sites, and the generalisation of the estimates to the overall MSM population might be problematic. However, in some of the Sections that follow (e.g. those focusing on sexual behaviours), TLS and RDS datasets were combined to present aggregated data in circumstances where actual numbers were particularly low.

Introduction

This Chapter presents the main findings from the Sialon II survey (from both the TLS and RDS arms) and is therefore considerably longer than other Chapters in this report. Findings are therefore divided into a series of detailed sub-sections including:

- Section 5.1 - Sample description
- Section 5.2 - Prevention programmes
- Section 5.3 / 5.4 Partner numbers, anal intercourse, and condom use with steady and non-steady partners in the last six months
- Section 5.5 - Sexual behaviour in the last six months with a female partner
- Section 5.6 - Sexual behaviour during last episode
- Section 5.7 - Commercial sex
- Section 5.8 - High risk behaviour (fisting)
- Section 5.9 - HIV and other STIs
- Section 5.10 - Treatment and viral load

- Section 5.11 - Sexual health
- Section 5.12 - Substance use

There are some necessary variations in terms of how the above Sections are presented; for example due to the need to ensure that results are reported in line with UNAIDS guidance on GARPR reporting (e.g. Section 5.2 and 5.9). In other cases, to contextualise the results appropriately, additional background information is provided to give an overview of the key issue(s) under scrutiny (e.g. Sections 5.4, 5.5, 5.8). In other cases (e.g. Section 5.9), additional information is provided on the sources of data used (variables) as well as on how secondary variables were calculated, and on how inconsistent or missing data were dealt with. In all Sections, where necessary, further contextual comments are provided as endnotes.

Finally, in order to facilitate the reader, TLS cities/data and RDS cities/data are presented with a different background colours in the tables, so that it is clearer that different sampling methods were used in the different cities.

Limitations

The Sialon II project's methodology incorporated the most advanced approaches in implementing bio-behavioural surveys, in line with the indications in the scientific literature and international guidelines from ECDC, UNAIDS and WHO (UNAIDS/WHO, 2002; UNAIDS/WHO, 2000; Johnston, 2013; Kendall, 2008; Sabin, 2014; Zhao, 2014; WHO, 2010; WHO, 2011). However, some limitations regarding the methodology, tools adopted or the characteristics of the data were nevertheless evident and are described in the relevant parts of the report. Readers are advised to refer to Chapter 3 on Methodology where a clear description of the main limitations is provided.

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5.1 Sample description

Summary

The samples enrolled in the different cities present remarkable differences in terms of the age composition and educational levels, which do not necessarily reflect the real difference in the cities' MSM populations and could potentially be attributed to the differences in the social segments of the MSM population reached by the Sialon II study. Also the migration patterns present marked differences which, together with the tourism patterns, should be taken into account in interpreting the estimates across the cities. In some cities the migrant population represents a significant percentage (>20%) of the enrolled MSM compared to others where it appears to be almost absent. In line with other survey results, some cities manifest an important attraction factor for the MSM population probably due to the vast variety of gay venues on offer. These aspects have important implications for prevention policy and programmes that should be tailored to reach all the segments of the MSM population

This Section includes a description of the project sample recruited through TLS and RDS methods, and a socio-demographic description of the study population by city in terms of age, education, employment, migration status, city of residence and 'outness'. It also reports on social attitudes including homonegativity, and reported attendance at gay venues and other gay locations.

Sample description

In total 4,901 individuals participated in the Sialon II bio-behavioural survey. A total of 3,596 individuals were recruited through the TLS method. The TLS sample was distributed as follows among participating cities: 402 in Barcelona, 411 in Brighton, 391 in Brussels, 407 in Hamburg, 408 in Lisbon, 394 in Ljubljana, 411 in Sofia, 366 in Stockholm, and 406 in Warsaw. For RDS, a total of 1,305 individuals were recruited. The RDS sample was distributed as follows among participating cities: 400 in Bratislava, 183 in Bucharest, 400 in Verona, and 322 in Vilnius.

Table 5.1.1 shows the number of questionnaires collected, the number that were valid, and the percentage that were invalid, as well as the number of valid biological samples collected for each city. For TLS cities, the invalid rate of questionnaires was below 5% with the only exception being Ljubljana at 5.3%. Given the complexity of the survey and the diverse social and cultural contexts within which the TLS arm was implemented, this rate is considered very low. For RDS cities, the invalid rate was zero which is likely to be due to the 'ideal' conditions in which the questionnaire was administered. (e.g. a specific room being available in all sites with a member of the research team available to offer clarifications if required).

In TLS cities, HIV testing was carried out on oral fluid (OF) samples. According to the study protocol, the validity of the samples was assed using a Total IgG test. The total number of valid OF samples collected were: 400 in Barcelona; 402 in Brighton; 379 in Brussels; 390 in Hamburg; 371 in Lisbon; 347 in Ljubljana; 361 in Sofia; 356 in Stockholm, and; 405 in Warsaw (see Table 5.1.1). In RDS cities, HIV testing (as well as HBV, HCV, and syphilis) was carried out on serum samples. The total number of valid serum samples corresponds to the number of participants recruited (400 in Bratislava; 183 in Bucharest; 400 in Verona, and; 322 in Vilnius; Table 5.1.1).

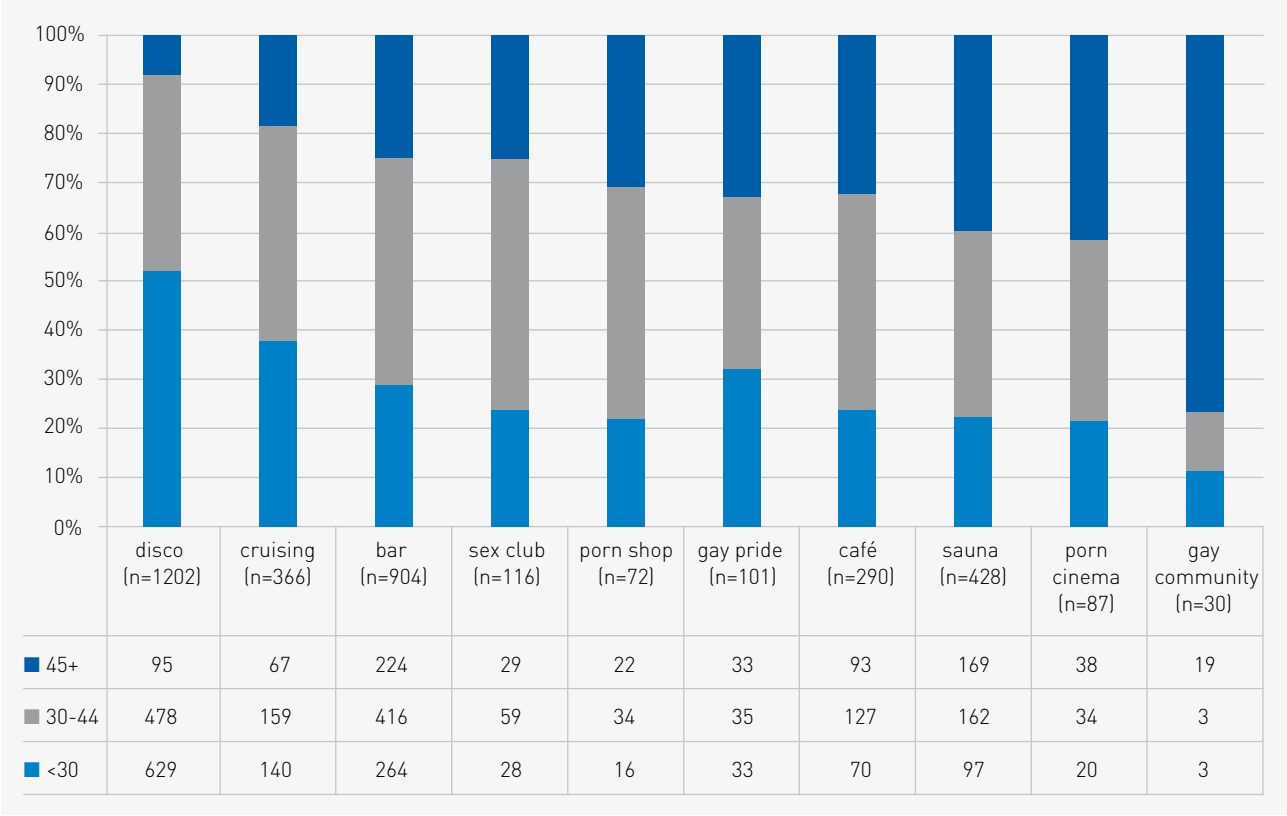
The recruitment of TLS participants by venue type and age is shown in Figure 5.1.1. Discos, bars, and saunas were the venues with the highest number of participants recruited (1,202, 904 and 428, respectively). The highest number of MSM younger than 30 years old were recruited in discos, bars and cruising venues.

Table 5.1.1 Number of valid and invalid questionnaires, and valid samples collected in TLS and RDS cities

	TLS methodology								
	Barcelona	Brighton	Brussels	Hamburg	Lisbon	Ljubljana	Sofia	Stockholm	Warsaw
Questionnaires collected	408	418	406	408	409	416	411	377	408
Valid questionnaires	402	411	391	407	408	394	411	366	406
% invalid questionnaires	1,5	1,7	3,7	0,2	0,2	5,3	0,0	2,9	0,5
Valid samples collected	400	402	379	390	371	347	361	356	405

	RDS methodology			
	Bratislava	Bucharest	Verona	Vilnius
Questionnaires collected	400	183	400	322
Valid questionnaires	400	183	400	322
% invalid questionnaires	0,0	0,0	0,0	0,0
Valid samples collected	400	183	400	322

Figure 5.1.1 Participants recruited by venue type and age group



	disco (n=1202)	cruising (n=366)	bar (n=904)	sex club (n=116)	porn shop (n=72)	gay pride (n=101)	café (n=290)	sauna (n=428)	porn cinema (n=87)	gay community (n=30)
45+	95	67	224	29	22	33	93	169	38	19
30-44	478	159	416	59	34	35	127	162	34	3
<30	629	140	264	28	16	33	70	97	20	3

Age

Respondents were aged between 18 and 81 years old. The age distribution of the MSM population in the study is presented in Figure 5.1.2. The most common age group overall was 25–35 years. Respondents in Hamburg, Barcelona and Lisbon had a similar age distribution and were the oldest (median age 36, 35.5, and 36 respectively). The MSM population in Bratislava, Ljubljana, Sofia, Stockholm, Verona, Vilnius, and Warsaw were the youngest (median age less than 30 years; see Table 5.1.2).

Figure 5.1.2 Age group distribution by city

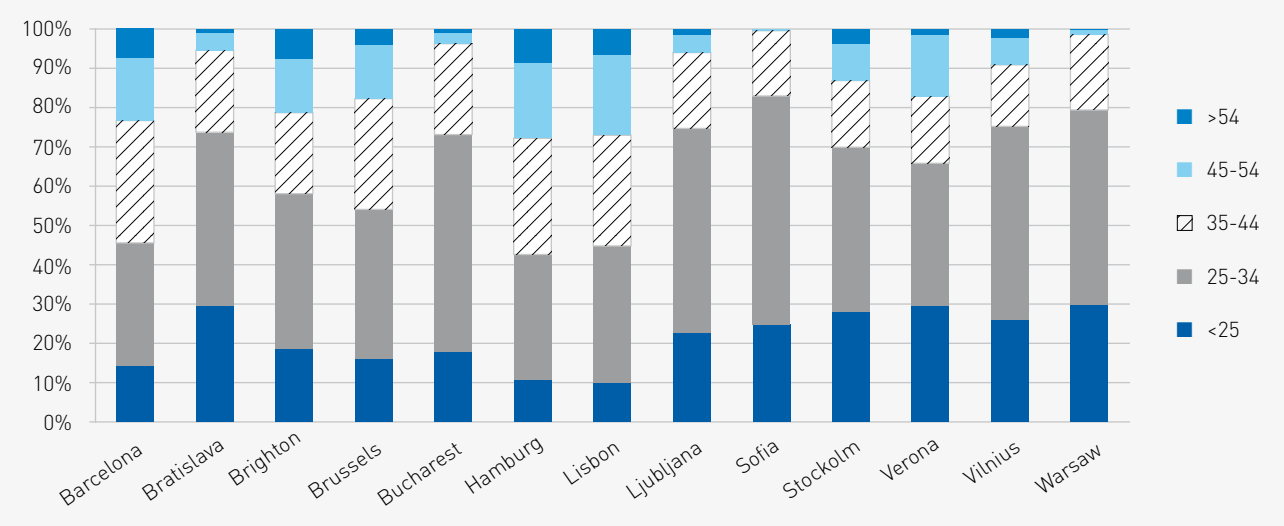


Table 5.1.2 Mean, median, maximum and minimum of age by study city

City	Mean	SD	Median	Minimun	Maximun
BARCELONA	37.2	1.88	35.5	19	79
BRATISLAVA	30.3	8.18	29	18	62
BRIGHTON	35.1	2.50	32	18	74
BRUSSELS	34.9	1.07	33	18	68
BUCHAREST	30.8	7.33	31	19	58
HAMBURG	38.0	1.18	36	18	79
LISBON	37.9	1.19	36	19	76
LJUBLJANA	30.5	0.87	29	18	73
SOFIA	29.6	0.30	29.5	18	58
STOCKHOLM	31.7	1.17	28	18	81
VERONA	31.9	10,37	29	18	70
VILNIUS	30.7	9.03	28	19	59
WARSAW	28.8	0.93	28	18	71

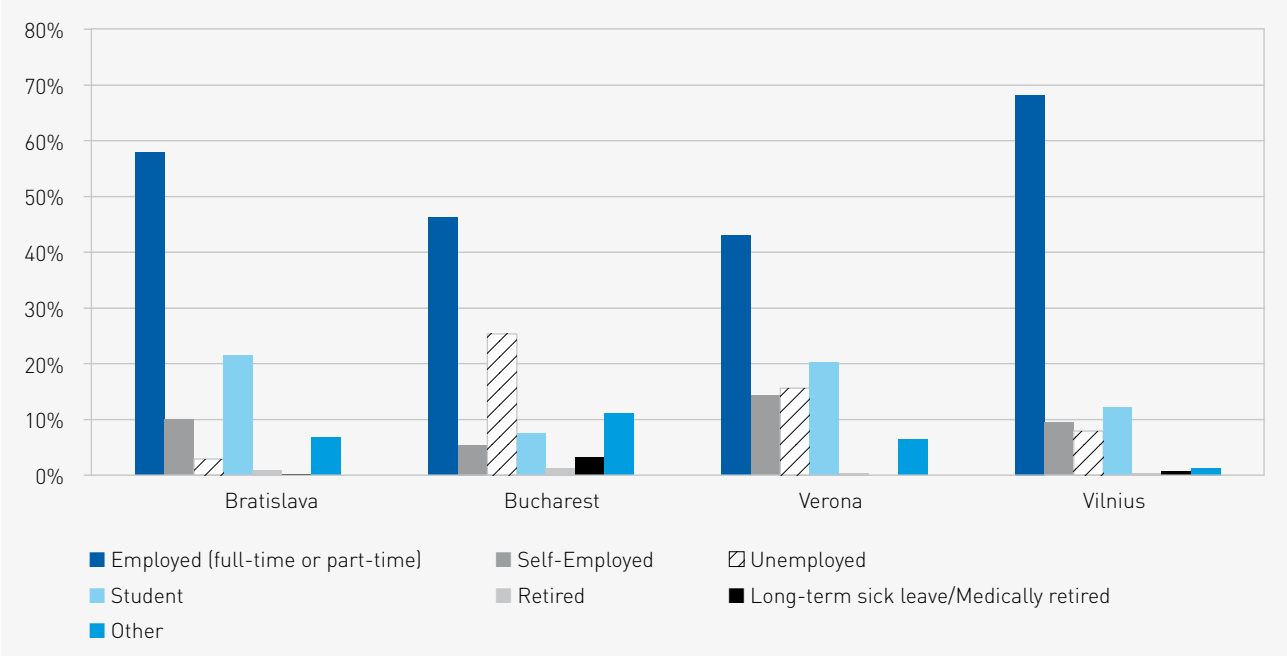
SD: Standard Deviation

According to the UNAIDS GARPR Guidelines, the disaggregation by age of the indicator estimates should be based on respondents younger than 25 years and equal/older than 25 years. In this report many estimates are reported based on this age disaggregation. The highest percentage of participants < 25 years were from Warsaw (30%), Bratislava (29.6%), Verona (29.7%), and Stockholm (28.1%; Table 5.1.3). The lowest percentage was reported in Lisbon (10%), Hamburg (10.6%), and Barcelona (14.3%). Due to the small sample size when disaggregated, the estimates of these cities are less precise with relatively wide confidence intervals.

Table 5.1.3 Percentage of MSM younger than 25 years old

City	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Denominator
BARCELONA	**14.3**	5.8	31.2	8.01	402
BRATISLAVA	**29.6**	24.3	35.1	1.98	400
BRIGHTON	**18.6**	11.8	28.2	3.42	411
BRUSSELS	**15.9**	8.9	26.8	9.37	391
BUCHAREST	**18.0**	10.5	25.2	1.76	181
HAMBURG	**10.6**	5.9	18.3	4.43	407
LISBON	**10.0**	5.3	18.1	6.60	408
LJUBLJANA	**22.5**	16.8	29.4	1.92	394
SOFIA	**24.9**	20.8	29.4	0.20	411
STOCKHOLM	**28.1**	20.5	37.3	5.29	366
VERONA	**29.7**	21.6	38.0	3.62	397
VILNIUS	**26.1**	19.5	32.7	2.27	322
WARSAW	**30.0**	18.5	44.8	8.26	406

Figure 5.1.3 Employment status by study city (only for RDS)



Employment and education

Participants in the RDS study were asked about their current occupation (see Figure 5.1.3). Most of the respondents reported having some form of employment (full-time, part-time or self-employed) with 77.7% in Vilnius, 67.9% in Bratislava, 57.2% in Verona, and 51.6% in Bucharest. Respondents in Bucharest had the highest rate of unemployment (25.3%), whereas participants from Bratislava and Verona had the largest percentage of students (21.4% and 20.3%, respectively).

Participants were also asked about their highest educational qualification which was then grouped into low (elementary and secondary school), medium (high or post-high school education) or high (university education below degree, and university degree [Bachelor, Masters, PhD]) education.

The percentage of men reporting a high level of education ranged from 29.3% in Verona to 79.1% in Lisbon. Other cities where high levels of education were reported included Vilnius (70.1%), Warsaw (69.9%), Brussels (66.3%), and Brighton (65.1%). Verona, Barcelona, and Bucharest had the highest percentages of men with low levels of education (17.1%, 16.5%, and 12.3% respectively; see Table 5.1.4).

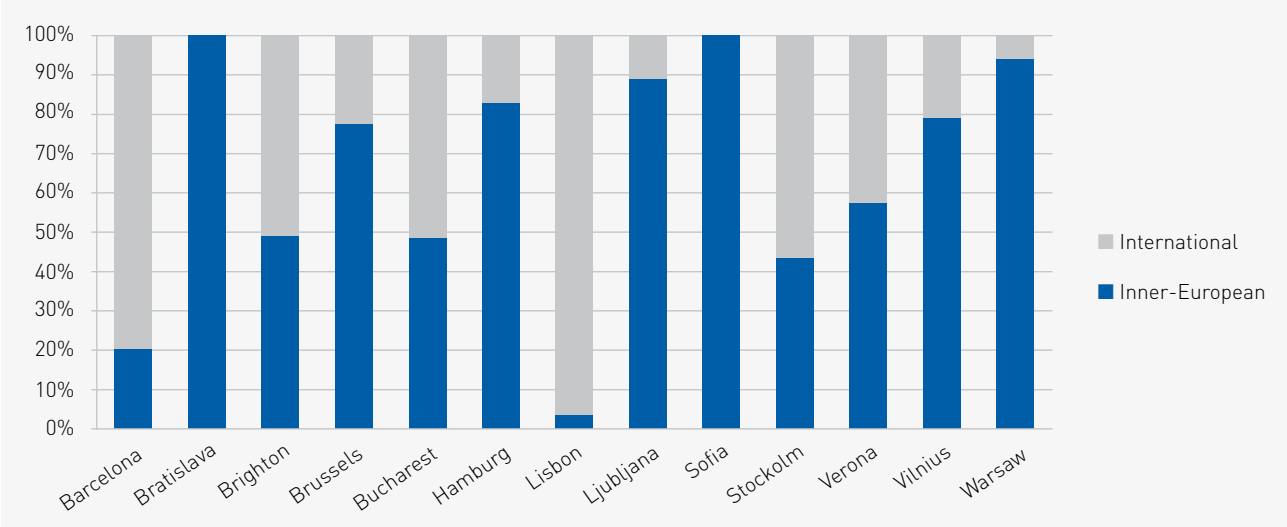
Table 5.1.4 Educational qualifications by study city

City	Education Level	Point Estimate	95% Lower Bound	95% Upper Bound	Design Effect
BARCELONA N=395	Low	**16.5**	10.2	25.6	2.73
	Medium	**31.7**	27.4	36.4	0.60
	High	**51.8**	43.6	59.9	1.74
BRATISLAVA N=395	Low	**4.6**	2.0	7.2	2.12
	Medium	**42.1**	36.2	47,5	1.79
	High	**53.3**	47.7	59.2	1.87
BRIGHTON N=402	Low	**6.2**	2.9	13.0	2.87
	Medium	**28.7**	24.8	32.8	0.59
	High	**65.1**	58.5	71.1	1.33
BRUSSELS N=372	Low	2.2	1.00	5.0	2.31
	Medium	**31.5**	25.0	38.7	3.34
	High	**66.3**	58.9	73.0	3.45
BUCHAREST N=176	Low	**12.3**	3.1	21.5	3.68
	Medium	**50.9**	40.2	61.5	2.11
	High	**36.8**	23.7	49.9	3.44
HAMBURG N=404	Low	**5.3**	2.0	13.1	5.66
	Medium	**45.3**	37.1	53.7	3.23
	High	**49.4**	40.0	58.9	4.18
LISBON N=402	Low	**2.2**	0.6	7.5	5.38
	Medium	**18.7**	13.6	25.0	3.25
	High	**79.1**	74.8	82.9	1.48
LJUBLJANA N=388	Low	**2.6**	1.3	5.1	1.03
	Medium	**43.1**	39.3	47.0	0.51
	High	**54.3**	50.7	57.9	0.44

City	Education Level	Point Estimate	95% Lower Bound	95% Upper Bound	Design Effect
SOFIA N=402	Low	**6.6**	3.6	11.6	0.48
	Medium	**36.7**	30.5	43.4	0.36
	High	**56.7**	51.5	61.8	0.22
STOCKHOLM N=361	Low	**5.2**	1.9	13.3	7.78
	Medium	**47.5**	39.8	55.3	3.66
	High	**47.3**	39.0	55.6	4.22
VERONA N=386	Low	**17.1**	10.7	23.8	3.28
	Medium	**53,6**	46,2	61,2	2,46
	High	**29,3**	22.0	36.1	2.60
VILNIUS N=316	Low	**0**			
	Medium	**29.9**	22.8	37.7	2.6
	High	**70.1**	62.3	77.2	2.6
WARSAW N=396	Low	**1.5**	0.3	7.4	3.85
	Medium	**29.7**	21.7	39.1	3.50
	High	**68.9**	60.3	76.3	2.89

Low: ≤Secondary education; Medium: high or post high school education; High: ≥university education

Figure 5.1.4 Inner-European and intercontinental migration by city



Migration

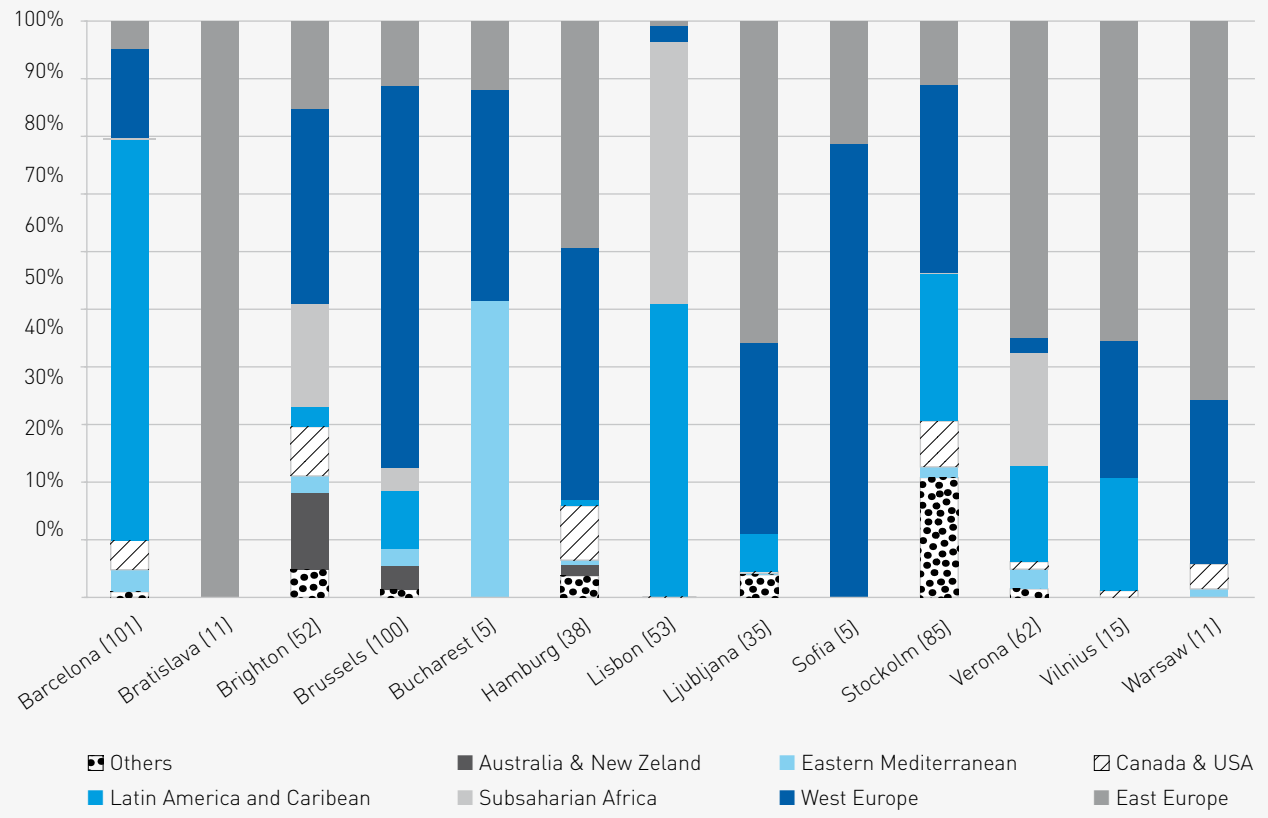
In Sialon II 'migrants' were considered as those men who were born in a different country from the one in which they currently reside. The cities with the highest percentage of migrants were Brussels (31.6%) and Barcelona (25.2%). In contrast, cities with the lowest percentages of migrants (less than 10%) were Bratislava, Bucharest, Hamburg, Ljubljana, Sofia, Vilnius, and Warsaw (Table 5.1.5).

Almost all migrants in Sialon II came from Europe, except in Barcelona and Lisbon where most migrants reported country of origin as being outside the European continent (see Figure 5.1.4).

Table 5.1.5 Percentage of migrants by city

City	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Denominator
BARCELONA	**25.2**	18.3	33.6	2.02	400
BRATISLAVA	**3.2**	1.6	5.0	1.32	400
BRIGHTON	**14.2**	11.6	17.2	0.51	408
BRUSSELS	**31.6**	22.4	42.6	7.75	391
BUCHAREST	**3.0**	0	6.3	1.82	183
HAMBURG	**4.4**	2.6	7.4	1.46	404
LISBON	**11.7**	6.9	19.3	5.59	408
LJUBLJANA	**9.3**	5.8	14.6	1.86	389
SOFIA	**0.1**	0	0.7	0.07	411
STOCKHOLM	**18.0**	15.3	21.1	0.86	366
VERONA	**15.2**	8.3	21.9	4.48	400
VILNIUS	**5.2**	2.1	8.5	2.06	322
WARSAW	**2.4**	0.8	7.4	3.08	405

Figure 5.1.5 Regions of origin among migrants by city



Based on EMIS and WHO countries classification, "Others" included: South East Asia and Western Pacific regions; "West Europe" included: West Europe, North West Europe, Central West Europe, South West Europe and "East Europe" included: North East Europe, Central East Europe, South East Europe and East Europe.

It is worth noting that in Bucharest, Stockholm and Brighton both percentages (European and intercontinental migrants) were similar.

In order to describe migration patterns better, an additional graph is provided showing the main regions of origin according to the WHO and EMIS country classifications (see Figure 5.1.5). Taking into account migrants from outside of Europe, the highest percentages of men from Latin American and Caribbean were seen in Barcelona (69.6%), in Lisbon (51%) and Stockholm (25.6%) whilst 51.5% of all migrants in Bucharest where from the Eastern Mediterranean Lisbon also received a significant percentage of migrants from Sub-Saharan Africa (45.3%), as well In as migrants from Latin America and the Caribbean.

City of residence

Participants were asked about their place of residence with the question 'Where do you live?' and in doing so, were offered the following options: 'In the study city'; 'Within 100 km from the study city'; 'Tourist or visitor from the same country'; 'Tourist or visitor from another country'.

Almost all the participants from Bucharest and Sofia were men living in the study city (94.5% and 91.6%, respectively). More than 80% of men in Barcelona, Bratislava, Brighton, Ljubljana, Stockholm, Verona and Vilnius reported living in the study city or within 100 km the study city. Brussels and Lisbon were the cities with the highest percentages of visitors from another country or tourists (21.5% and 32.3%, respectively; see Figure 5.1.6).

According to migrant and visitor status, the percentage of foreign-born participants by city ranged from 2.3% in Sofia, 3.0% in Bucharest or 3.5% in Bratislava to 41.3% in Barcelona, 48.9% in Lisbon and 54.1% in Brussels. In the middle range were Hamburg (7.7%), Vilnius (9.0%), Warsaw (9.7%), Ljubljana (14.5%), Verona (16%), Brighton (17.3%) and Stockholm (29.0%).

Figure 5.1.6 City of residence of participants by study city

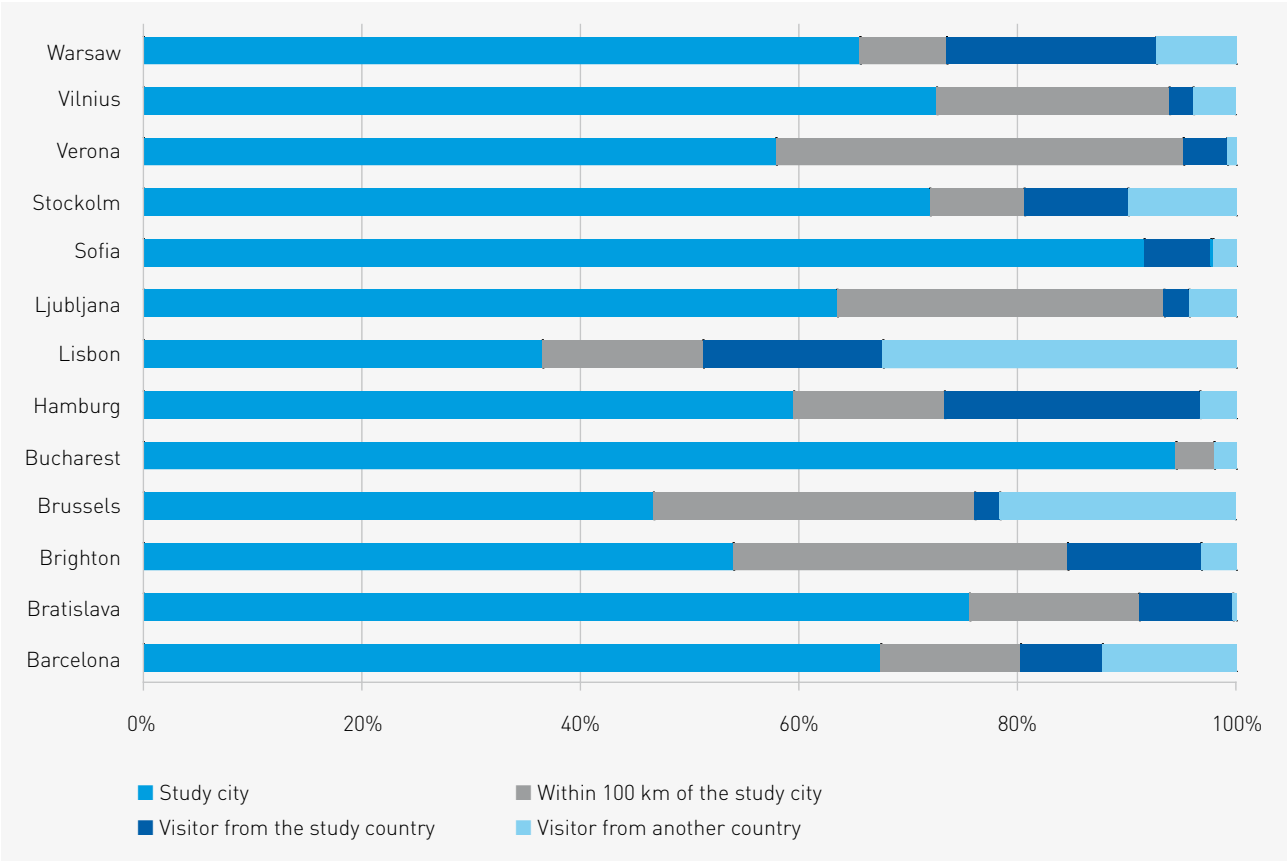


Table 5.1.6 Percentage of MSM out to no-one or only a few by study city

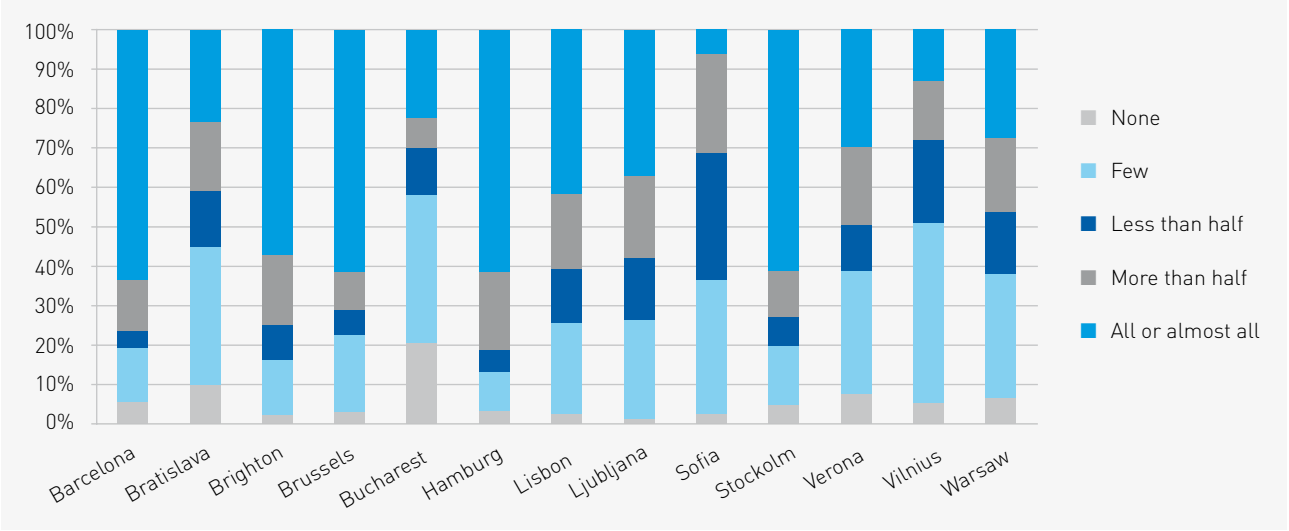
City	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Denominator
BARCELONA	**19.3**	15.5	23.8	0.72	390
BRATISLAVA	**45.1**	39.6	52.6	2.34	393
BRIGHTON	**16.2**	11.5	22.4	1.66	397
BRUSSELS	**22.8**	13.6	35.5	10.75	380
BUCHAREST	**58.1**	47.1	69.2	2.33	174
HAMBURG	**13.2**	8.2	20.7	3.65	396
LISBON	**25.5**	19.3	32.9	3.75	399
LJUBLJANA	**26.3**	21.4	32.0	1.18	380
SOFIA	**36.5**	31.1	42.2	0.28	409
STOCKHOLM	**19.8**	13.5	28.1	4.47	311
VERONA	**38.9**	31.8	46.7	2.58	393
VILNIUS	**51.0**	44.8	58.2	1.87	320
WARSAW	**38.1**	29.7	47.4	3.22	400

'Outness'

In this study, 'outness' was defined as the degree to which people are open about their sexual attraction with others. The related question stated 'Thinking about all the people who know you (including family, friends and work or study colleagues), what percentage know that you are attracted to men?' Five possible responses were offered: 'All or almost all'; 'More than half'; 'Less than half'; 'Few', and 'None'.

The percentage of men who were out to 'all or almost all' of the people they knew ranged from 6.3% in Sofia to 63.3% in Barcelona. More than half of the men in Brighton, Brussels, Hamburg and Stockholm reported being out to 'all or almost all' the people they knew (see Figure 5.1.7). The highest percentage of men out to

Figure 5.1.7 Level of 'outness' by study city



'no-one or only a few were from the RDS study cities: 38.9% in Verona; 45.1% in Bratislava, 58.1% in Bucharest, and 51.0%, in Vilnius (Table 5.1.6).

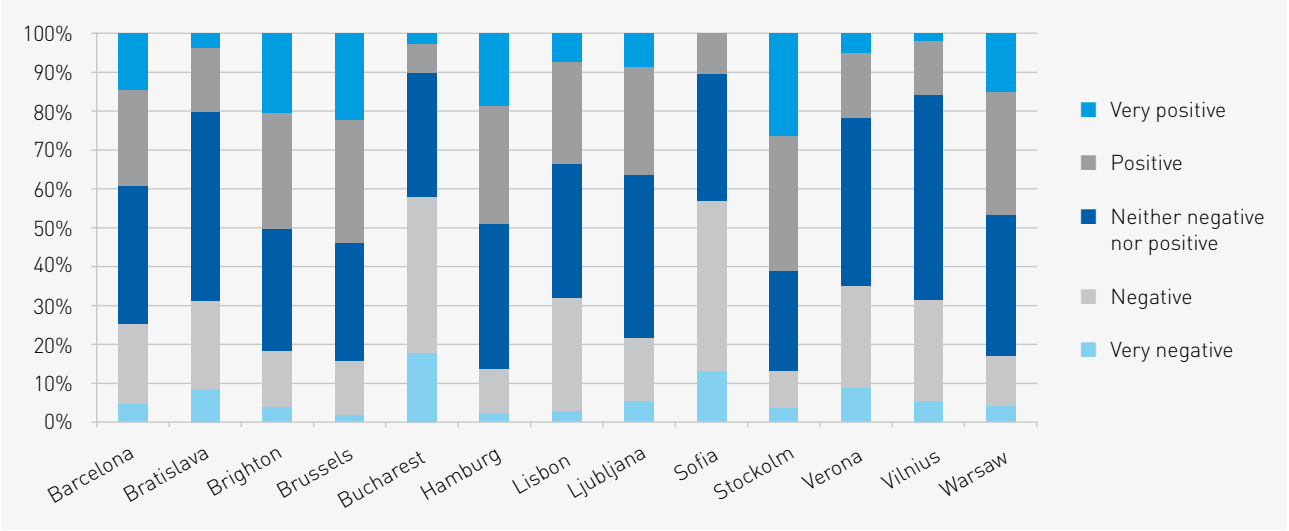
Social attitude

Both TLS and RDS respondents were asked about other people's attitude towards gays or bisexuals at work/school, among their parents, and friends/acquaintances. Five answers were offered: 'Very negative'; 'Negative'; 'Neither negative nor positive'; 'Positive' and 'Very positive'. Negative and very negative attitudes are called 'perceived homonegativity' and are analysed in detail as follows.

Table 5.1.7 Percentage of men reporting negative or very negative attitude towards gays or bisexuals at work/school by study city

City	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Denominator
BARCELONA	**25.4**	16.9	36.3	3.21	384
BRATISLAVA	**31.2**	26.2	37.0	1.89	397
BRIGHTON	**18.3**	12.9	25.3	1.92	386
BRUSSELS	**15.8**	9.9	24.4	5.90	376
BUCHAREST	**57.9**	48.8	67.0	1.57	174
HAMBURG	**14.0**	9.0	21.1	3.25	400
LISBON	**31.9**	23.4	41.8	6.04	400
LJUBLJANA	**21.9**	16.3	28.7	1.83	387
SOFIA	**57.0**	51.1	62.7	0.28	409
STOCKHOLM	**13.1**	9.2	18.3	2.42	310
VERONA	**35.0**	27.4	42.5	2.73	388
VILNIUS	**31.6**	25.1	37.8	1.88	321
WARSAW	**17.0**	11.2	24.7	3.01	395

Figure 5.1.8 Attitude towards gays or bisexuals at work/school by study city



The highest percentage of perceived homonegativity towards gay or bisexual men at work/school was observed in Bucharest and Sofia (more than half of the respondents). There were no men reporting 'very positive' attitudes in Sofia. The lowest percentage of men reporting perceived homonegativity at work/school was in Stockholm and Hamburg (13.30% and 14%, respectively; see Table 5.1.7 and Figure 5.1.8).

Perceived parent's homonegativity level was reported to be highest in Bucharest followed by Vilnius (51.6% and 46.9%, respectively).

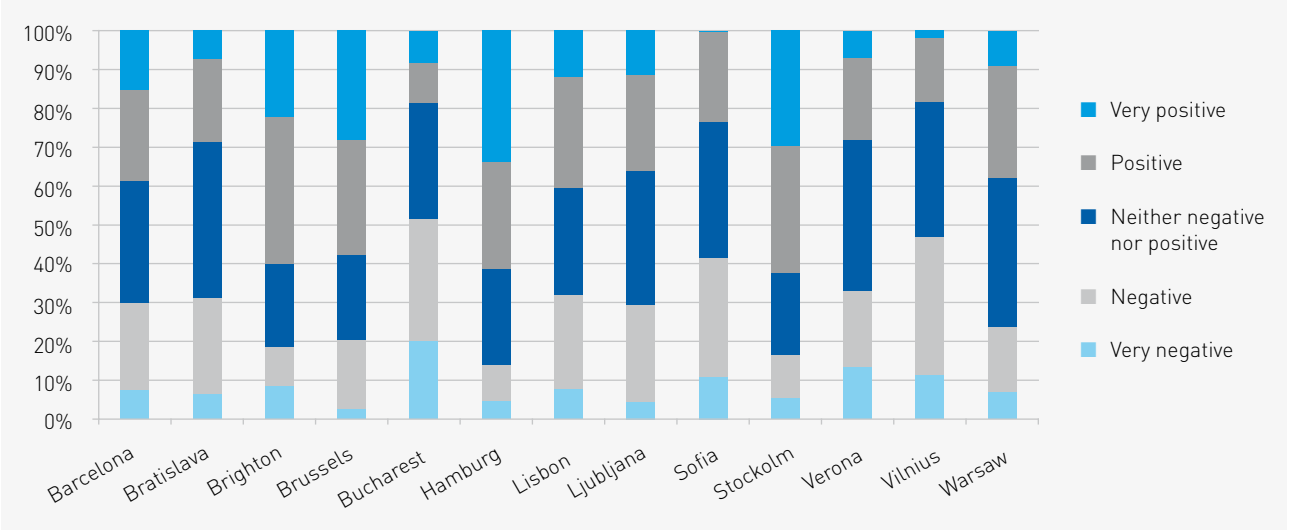
The lowest percentage of men reporting perceived parent's homonegativity was in Hamburg and Stockholm (13.8% and 16.6%, respectively) (see Table 5.1.8 and Figure 5.1.9).

The lowest reported levels of "homonegativity" were found in relation to the friend's circles in all the cities. The highest percentage of men reporting 'negative' or 'very negative' attitudes of friends/acquaintances to-

Table 5.1.8 Percentage of men reporting negative or very negative parents' attitude towards gays or bisexuals by study city

City	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Denominator
BARCELONA	**29.9**	21.1	40.5	2.65	367
BRATISLAVA	31.3	26.6	36.7	1.64	397
BRIGHTON	**17.9**	14.4	23.7	1.04	370
BRUSSELS	**20.4**	15.35	36.4	2.79	370
BUCHAREST	51.6	40.4	62.8	2.09	157
HAMBURG	**13.8**	8.9	20.9	3.23	391
LISBON	**32.0**	24.0	41.2	5.02	391
LJUBLJANA	**29.5**	24.4	35.1	1.11	378
SOFIA	**41.7**	36.1	47.6	0.29	411
STOCKHOLM	**16.6**	12.6	21.5	1.90	300
VERONA	33.1	25.7	40.6	2.68	382
VILNIUS	46.9	40.1	53.6	1.65	312
WARSAW	**23.8**	20.2	27.9	0.75	374

Figure 5.1.9 Parents attitude towards gays or bisexuals by study city



wards gay or bisexuals was also in Bucharest (31.8%), whereas the lowest levels were observed in Brussels and Brighton (1.70% in each city) (see Table 5.1.9 and Figure 5.1.10).

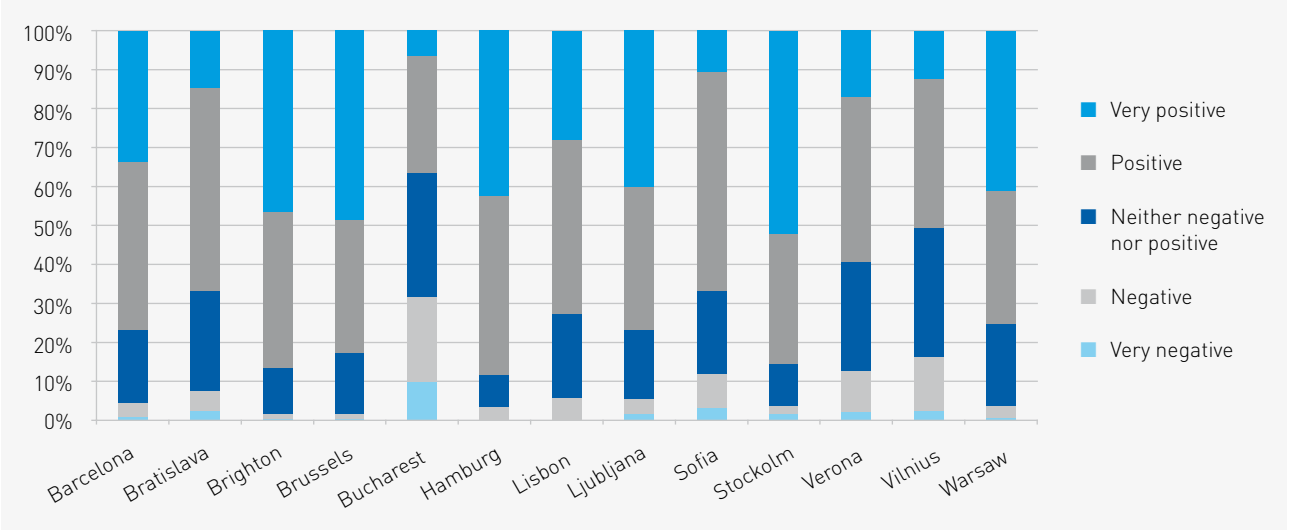
Venue attendance

In the TLS cities, participants were asked about the number of times they had visited specific gay venues during the previous three months. These venues included: gay clubs; gay cafés; gay bars; saunas; sex clubs; sex shops; video clubs; cruising locations, and other special events (e.g. gay pride, carnival, etc.). Question regarding venue attendance were slightly different between RDS and TLS arms as RDS participants were asked about

Table 5.1.9 Percentage of men reported negative or very negative friends'/acquaintances' attitude towards gays or bisexuals by study city

City	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Denominator
BARCELONA	**4.3**	1.8	10.4	2.23	377
BRATISLAVA	**7.7**	4.7	10.7	1.72	397
BRIGHTON	**1.7**	0.8	3.9	0.88	386
BRUSSELS	**1.7**	0.6	4.3	2.49	376
BUCHAREST	**31.8**	21.0	42.5	2.25	160
HAMBURG	**3.4**	1.7	6.7	1.83	394
LISBON	**5.8**	2.6	12.5	5.65	393
LJUBLJANA	**5.5**	2.9	10.0	1.78	383
SOFIA	**11.9**	8.4	16.6	0.33	411
STOCKHOLM	**4.0**	1.9	8.2	3.01	305
VERONA	**12.8**	7.3	18.5	3.02	384
VILNIUS	**16.3**	11.4	21.9	2.01	319
WARSAW	**3.8**	2.2	6.3	0.97	380

Figure 5.1.10 Friends'/acquaintances' attitude towards gays or bisexuals by study city



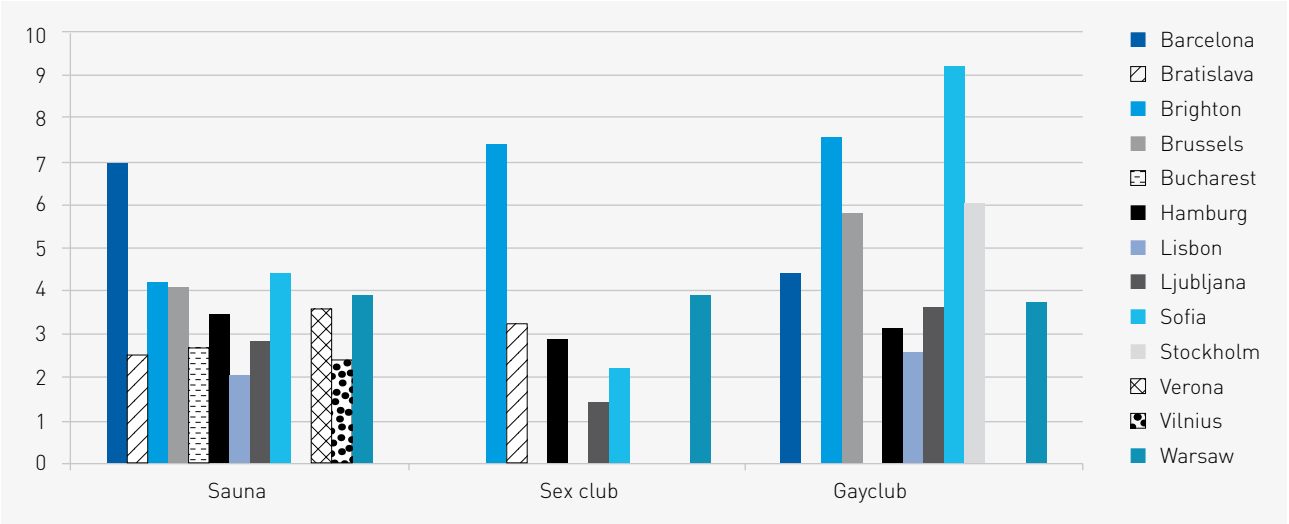
how many times they had visited venues were sex is or is not possible on site respectively, saunas or cruisings during the last 3 months.

Sofia was the city where the largest percentage of men reported attendance at a gay club in the previous three months (97.3%) which is double that of the city where the lowest percentage was reported (see Table 5.1.10). The largest mean number of times this type of venue was visited was by participants from Sofia (Figure 5.1.11).

Table 5.1.10 Percentage of men attending gay clubs during the last three months by city (TLS only)

City	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Denominator
BARCELONA	**56.4**	39.3	72.0	6.94	354
BRIGHTON	**65.9**	55.9	74.8	2.68	328
BRUSSELS	**83.5**	73.4	90.3	7.34	332
HAMBURG	**43.9**	28.7	60.3	12.36	406
LISBON	**54.8**	49.1	60.3	1.68	347
LJUBLJANA	**76.8**	65.0	85.5	4.68	365
SOFIA	**97.3**	90.8	99.3	0.92	402
STOCKHOLM	**72.1**	60.4	81.4	6.16	245
WARSAW	**77.0**	68.4	83.8	3.11	397

Figure 5.1.11 Mean number of times visiting saunas, sex clubs, and gay clubs by city (among the attendees only)



Of those participants who reported visiting gay cafés in the last three months, almost all were from Sofia (99.8%) (See Table 5.1.11). The largest mean number of times this type of venue was visited was by participants from Sofia (Figure 5.1.12).

Brighton was the city with the highest reported percentage of men who had visited a gay bar during the last three months (96.0%). The lowest percentage of attendance was observed in Ljubljana (29.5%; see Table 5.1.12). The largest mean number of times this type of venue was visited was by participants from Brighton (Figure 5.1.12).

Table 5.1.11 Percentage of men attending gay cafés during the last three months by city (TLS only)

City	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Denominator
BARCELONA	**46.8**	36.0	57.8	2.80	344
BRIGHTON	**0**				
BRUSSELS	**79.7**	67.1	88.2	8.84	316
HAMBURG	**42.9**	37.1	48.8	1.55	405
LISBON	**19.3**	9.5	35.2	10.21	255
LJUBLJANA	**21.4**	13.2	32.9	3.62	285
SOFIA	**99.8**	99.2	100.0	0.09	407
STOCKHOLM	**68.5**	62.1	74.3	1.91	259
WARSAW	**0**				

Figure 5.1.12 Mean number of times visiting cruising, gay bars, and cafes by city (among the attendees only)

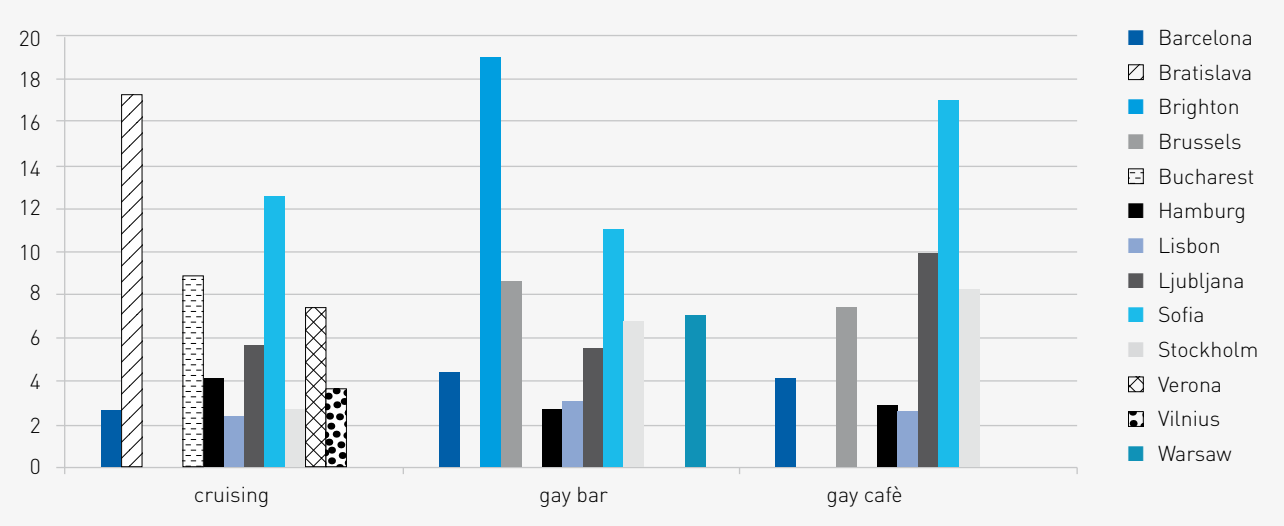


Table 5.1.12 Percentage of men attending gay bars during the last three months by city (TLS only)

City	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Denominator
BARCELONA	**48.7**	35.8	61.8	4.33	349
BRIGHTON	**96.0**	88.3	98.7	3.67	366
BRUSSELS	**81.6**	70.7	89.0	7.09	319
HAMBURG	**43.9**	28.7	60.3	12.63	406
LISBON	**37.7**	25.2	52.1	10.70	348
LJUBLJANA	**29.5**	18.1	44.3	5.68	289
SOFIA	**86.8**	83.9	89.3	0.13	384
STOCKHOLM	**35.3**	26.6	45.0	3.81	218
WARSAW	**45.5**	33.6	57.9	5.92	397

Sofia was the city where the largest percentage of men reported attendance at a gay sauna in the last three months, whilst the lowest was in Lisbon (69.8% and 4.9%, respectively) (Table 5.1.13). The largest mean number of times this type of venue was visited in the last three months was by participants from Barcelona (Figure 5.1.11).

The proportion of men attending a sex club in the last three months was the highest in Brussels (35.5%) and the lowest in Ljubljana (See Table 5.1.14). The largest mean number of times this type of venue was visited was by participants in Brighton (Figure 5.1.11).

The percentage of men who reported attendance at a sex shop in the last three months ranged from 21,5% in Sofia to 39.3% in Brussels (see Table 5.1.15). The largest mean number of times this type of venue was visited was by participants in in Sofia (Figure 5.1.13).

Table 5.1.13 Percentage of men attending saunas during the last three months by city

City	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Denominator
BARCELONA	**36.4**	25.3	49.1	4.02	352
BRATISLAVA	**27.5**	0.6	33.2	1.82	380
BRIGHTON	**29.8**	16.5	47.6	8.13	314
BRUSSELS	**50.7**	42.5	58.8	3.55	312
BUCHAREST	**12.0**	3.9	20.2	2.27	137
HAMBURG	**11.0**	7.4	16.2	2.34	406
LISBON	**4.9**	2.3	9.8	3.39	314
LJUBLJANA	**24.7**	10.3	48.4	14.57	297
SOFIA	**69.8**	63.0	75.7	0.41	378
STOCKHOLM	**0**				
VERONA	**7.4**	19.1	35.7	3.47	358
VILNIUS	**13.5**	8.5	18.3	2.01	312
WARSAW	**19.8**	11.7	31.4	6.13	397

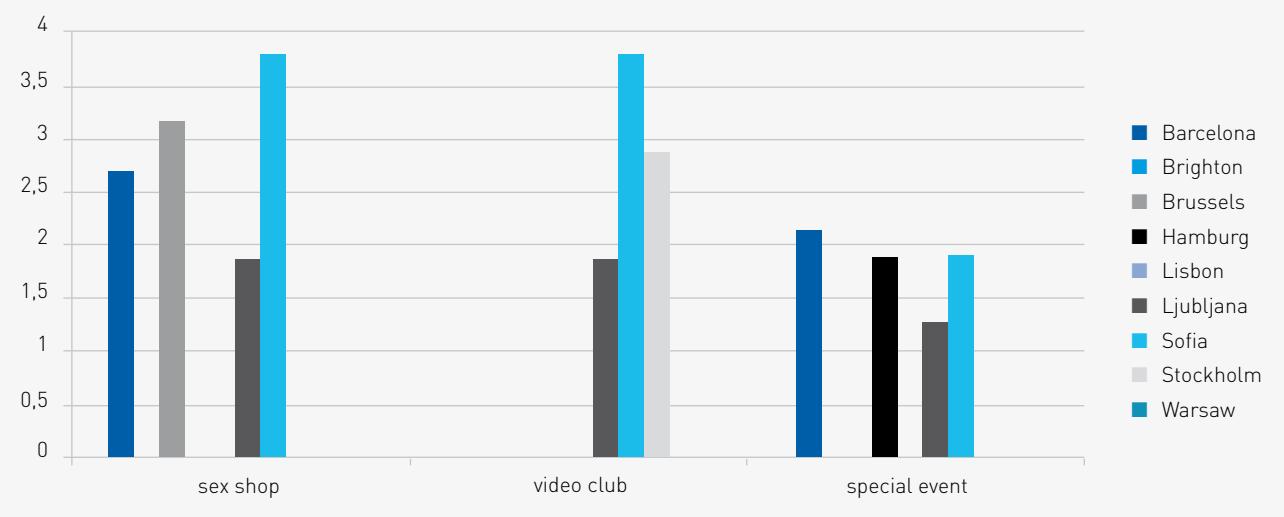
Table 5.1.14 Percentage of men attending sex clubs during the last three months by city (TLS only)

City	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Denominator
BARCELONA	**0**				
BRIGHTON	**18.7**	11.8	28.4	2.98	290
BRUSSELS	**35.5**	19.2	56.2	19.51	263
HAMBURG	**23.9**	15.1	35.7	7.43	406
LISBON	**0**				
LJUBLJANA	**10.2**	5.9	17.2	2.29	261
SOFIA	**18.2**	14.8	22.1	0.20	364
STOCKHOLM	**0**				
WARSAW	**17.6**	9.6	30.1	7.51	397

Table 5.1.15 Percentage of men attending sex shops during the last three months by city (TLS only)

City	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Denominator
BARCELONA	**26.0**	18.8	34.7	2.58	352
BRIGHTON	**0**				
BRUSSELS	**39.3**	27.8	52.1	8.80	271
HAMBURG	**0**				
LISBON	**0**				
LJUBLJANA	**20.2**	13.0	29.9	3.53	266
SOFIA	**21.5**	16.4	27.8	0.49	360
STOCKHOLM	**0**				
WARSAW	**0**				

Figure 5.1.13 Mean number of times visiting sex shops, video clubs, and special events by city (among the attendees only)



The percentage of participants attending a video club in the last three months was the highest in Stockholm (20.5%). The largest mean number of times this type of venue was visited was by participants from Sophia (see Table 5.1.16 and Figure 5.1.13).

Attendance at special events in the previous three months were the most popular among respondents from Hamburg (42.5%). The largest mean number of times this type of location was visited was by participants from Barcelona (see Table 5.1.17 and Figure 5.1.13).

Cruising locations were visited in the last three months mostly by participants from Sofia (71.3%) with the lowest from Vilnius (8.6%). The largest mean number of times this type of location was visited was by participants from Bratislava (See Table 5.1.18 and Figure 5.1.12).

For RDS cities with regards to gay locations where sex was *not* possible on site (e.g. social venues, bars, discos etc.), the largest proportion of men reporting attendance were from Bucharest (80.5%). The largest mean number of times these types of locations were visited was by participants from Verona (See Table 5.1.19, and Figure 5.1.14).

For RDS cities with regards to gay locations where sex *was* possible on site (e.g. clubs, porn cinemas, bars

Table 5.1.16 Percentage of men attending video clubs during the last three months by city (TLS only)

City	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Denominator
BARCELONA	0				
BRIGHTON	0				
BRUSSELS	0				
HAMBURG	0				
LISBON	0				
LJUBLJANA	1.1	0.4	3.3	0.96	252
SOFIA	4.9	4.4	5.6	0.02	350
STOCKHOLM	20.5	14.1	28.8	3.482	221
WARSAW	0				

Table 5.1.17 Percentage of men attending special events during the last three months by city (TLS only)

City	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Denominator
BARCELONA	9.3	1.3	44.2	27.79	369
BRIGHTON	0				
BRUSSELS	0				
HAMBURG	42.5	23.3	64.2	31.21	405
LISBON	0				
LJUBLJANA	15.4	9.4	24.2	3.62	262
SOFIA	8.3	3.5	18.2	1.68	351
STOCKHOLM	0				
WARSAW	0				

Figure 5.1.14 Mean number of times visiting venues where sex is not possible on site and venues where sex is possible on site (RDS only) (among the attendees only)

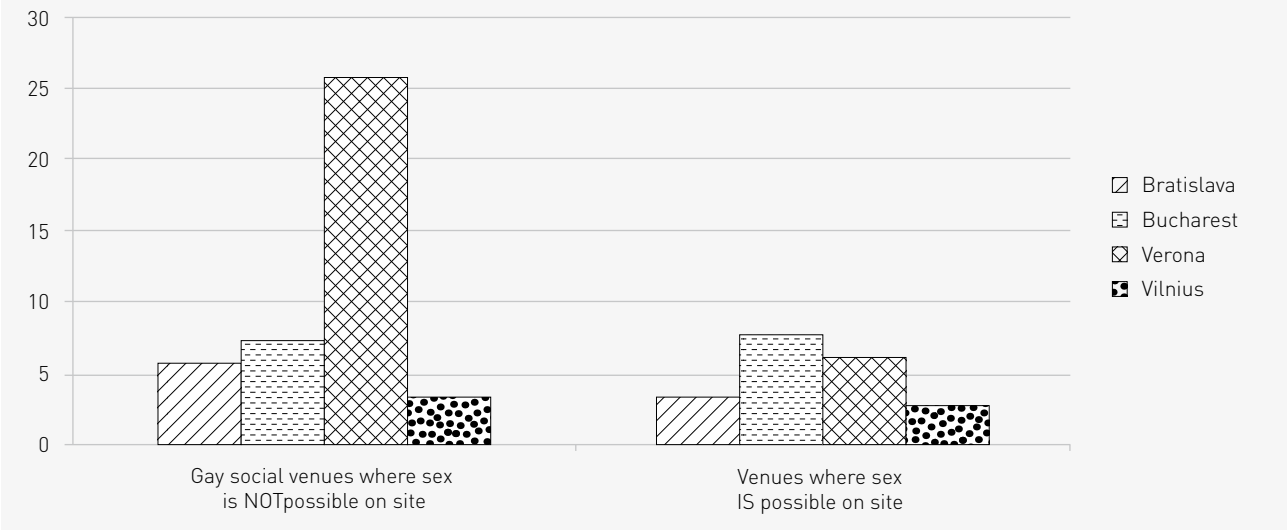


Table 5.1.18 Percentage of men attending cruising locations during the last three months by city

City	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Denominator
BARCELONA	24.0	13.1	39.9	6.26	342
BRATISLAVA	17.6	12.9	21.7	1.701	367
BRIGHTON	0				
BRUSSELS	0				
BUCHAREST	58.3	1.0	61.7	2.70	144
HAMBURG	21.3	13.4	32.2	6.47	406
LISBON	9.8	6.4	14.7	2.46	328
LJUBLJANA	14.3	8.2	23.8	3.23	280
SOFIA	71.3	63.5	78.0	0.56	403
STOCKHOLM	16.2	8.2	29.6	8.31	211
VERONA	21.7	15.0	8.0	2.76	352
VILNIUS	8.6	4.6	12.3	1.78	308
WARSAW	0				

Table 5.1.19 Percentage of men attending gay social venues, NGOs, bars, discos where sex is NOT possible on site during the last three months by city (RDS only)

City	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Denominator
BRATISLAVA	58.6	51.3	63.4	2.02	388
BUCHAREST	71.1	59.0	83.2	2.90	154
VERONA	80.5	73.9	86.8	2.71	366
VILNIUS	42.8	37.9	52.1	2.02	320

Table 5.1.20 Percentage of men attending clubs, porn cinema, bars with dark room or where sex IS possible on site during the last three months by city (RDS only)

City	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Denominator
BRATISLAVA	11.3	7.5	13.9	1.30	377
BUCHAREST	24.6	15.2	33.9	1.83	147
VERONA	49.0	41.2	56.3	2.34	367
VILNIUS	27.6	20.7	32.0	1.55	310

with dark rooms etc.), the largest proportion of men reporting attendance were from Verona (49%). The largest mean number of times these types of location were visited was by participants from Bucharest (See Table 5.1.20, and Figure 5.1.14).

Summary and conclusions

Differences in the age composition and educational level of the samples may not reflect real differences in the cities' MSM population. This might be related to the differences in the social segments of the MSM population reached by the Sialon II study.

Migrants represent a significant percentage (>20%) of the MSM population visiting gay venues in Brussels and Barcelona.

Lisbon, Brussels and Barcelona receive the highest number of tourists.

Similarities found with previous surveys like EMIS seem to confirm that migrant MSM are attracted to countries in the Western European sub-region.

The *level of 'outness'* differed substantially between the study areas. In Eastern European cities where homosexuality has become legal only recently, men were less likely to be out regarding their sexual attraction to men.

Use of the RDS method reached more hidden MSM populations in terms of being less likely to be 'out' about their sexual attraction to men.

Perceived homonegativity was most common in South-Eastern Europe, whilst Western levels were lower.

Gay clubs, gay cafes and gay bars were the most popular among TLS respondents; RDS respondents seems to have visited more often gay venues where sex was not possible on site.

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5.2 Prevention programmes

Summary

There are important differences between cities when comparing the number of men reached by prevention programmes (GARPR indicator 1.11). Even if most of the men in the TLS and RDS surveys knew where to go to get an HIV test, the percentage of men that had been given condoms during the last 12 months varied between the cities from less than half to almost all men. This is, therefore, an area where there seems to be room for improvement.

Older participants (≥25 years) tested more recently and more frequently than younger participants (<25 years). This might indicate that a larger group of young MSM are potentially not aware of their HIV status. The majority of the participants reported having tested within the last two years (2012 -2014); this was particularly evident in younger participants (<25 years).

There are marked differences between the cities regarding the extent of outreach activities and routines for providing condoms in health care settings and the type of venues sampled in the study.

In this Section, data from two core GARPR indicators are presented including GARPR 1.11 (percentage of men who have sex with men reached with HIV prevention programmes) and GARPR 1.13 (percentage of MSM who received an HIV test in the past 12 months and know their results). To be consistent with UNAIDS guidance on GARP reporting[1], findings relating to the GARPR indicators are presented differently from other sections (e.g. compared to Section 5.1 on sample description). In this present section data are disaggregated and presented by age categories <25/≥25. Data on other sexually transmitted infections (STIs) are then presented including syphilis, gonorrhoea, chlamydia, anogential warts, genital herpes, lymphogranuloma venereum (LGV), urethral outflow/ itching, and hepatitis B and C. The Section finishes with data from the RDS cities only on whether participating MSM would like to access HIV/STI testing in gay venues.

GARPR 1.11 - Percentage of men who have sex with men reached with HIV prevention programmes

To measure the extent to which HIV prevention programmes are reaching MSM, there are specific core indicators developed for international reporting to the WHO and UNAIDS as part of the GARP reporting.

The GARPR 1.11 indicator consists of the results from two questions included in the Sialon II survey: Do you know where you can go if you wish to receive an HIV test?, and; In the last 12 months, have you been given condoms (e.g. through an outreach service, drop in centre or sexual health clinic) excluding this Sialon II project? For both items, possible responses were 'yes', 'no', or 'I prefer not to answer'.

The percentage of men who answered yes to **both** these questions is shown in Table 5.2.1. In the TLS-cities more than half of respondents answered yes to both questions in all cities with the exception of Warsaw with less than one third of the participants answering yes. Conversely, less than half of the men in the RDS-cities answered yes to both questions, with the exception of men aged ≥25 years in Bucharest and men aged <25 years in Vilnius. The highest percentages were seen in Sofia and Hamburg with more than 80% reached with HIV prevention programmes. The lowest levels answering yes to both questions were seen in Bratislava and Warsaw with less than 30% or less reached through HIV prevention programmes.

1 UNAIDS (2015) Global AIDS Response Progress Reporting 2015. Construction of Core Indicators for monitoring the 2011 United Nations Political Declaration on HIV and AIDS. Geneva: WHO and UNAIDS.

In all cities (except Brighton, Hamburg, and Lisbon), older participants (≥25 years) were reached to a higher extent compared with younger participants (<25 years), despite differences between these age categories being small in most cities.

Table 5.2.1 Prevention Programmes Weighted Prevalence Among MSM, By City And Age Group (GARPR 1.11)

Numerator: Number of MSM who replied 'yes' to both questions 9 and 10.
Denominator: Total number of MSM surveyed.
Answers 'I prefer not to answer' in questions 9 and 10 were set to missing and thus ignored.
Note: MSM with previously known HIV-positive diagnosis are included in the results.

City	Age	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Sample Size
BARCELONA	<25	59.0	39.2	78.8	1.7	40
	25+	74.9	70.7	79.2	0.9	352
	Total	72.7	68.4	77.0	0.9	392
BRATISLAVA	<25	19.2	10.0	27.5	2.0	115
	25+	24.0	17.0	29.5	2.1	276
	Total	22.6	17.0	26.8	1.9	391
BRIGHTON	<25	64.0	43.8	84.1	2.8	63
	25+	54.5	39.8	69.2	7.5	328
	Total	56.3	45.3	67.2	4.9	391
BRUSSELS	<25	49.1	18.0	80.2	4.6	47
	25+	64.4	55.1	73.7	3.2	324
	Total	62.1	51.9	72.3	4.2	371
BUCHAREST	<25	27.4	12.6	42.4	1.4	46
	25+	50.7	38.4	62.9	2.0	122
	Total	45.9	36.1	55.7	1.7	170
HAMBURG	<25	84.3	69.8	98.7	1.5	37
	25+	81.0	76.6	85.4	1.2	357
	Total	81.4	77.6	85.1	1.0	394
LISBON	<25	79.9	63.9	95.9	1.4	35
	25+	64.4	51.2	77.6	7.2	364
	Total	66.0	52.7	79.3	8.2	399
LJUBLJANA	<25	48.6	38.8	58.3	1.2	119
	25+	50.9	44.4	57.4	1.1	265
	Total	50.4	44.4	56.4	1.4	384
SOFIA	<25	84.7	79.7	89.7	0.6	112
	25+	89.7	81.9	97.6	5.1	291
	Total	88.4	82.9	94.1	3.2	403
STOCKHOLM	<25	72.7	51.6	93.7	3.5	61
	25+	78.0	70.1	85.9	2.3	245
	Total	76.6	66.8	86.3	4.2	306

City	Age	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Sample Size
VERONA	<25	27.7	15.5	39.5	2.2	99
	25+	39.1	30.6	47.7	2.7	275
	Total	35.9	28.9	43.0	2.5	375
VILNIUS	<25	58.3	43.4	72.3	2.2	82
	25+	30.1	22.0	35.6	1.6	236
	Total	37.5	30.1	42.8	1.7	318
WARSAW	<25	25.5	13.0	38.0	1.9	91
	25+	30.2	22.5	37.9	2.3	311
	Total	28.8	23.3	34.3	1.5	402

Do you know where you can go if you wish to receive an HIV test?

At least 80% of participants in each city knew where to go to get an HIV test. There were slight differences between participant age groups indicating that men younger than 25 years were less aware of where to get an HIV test. In the younger age group, 80–90% of the men reported knowing where to go, and in two cities (Brighton and Ljubljana), the percentages of knowing where to go were higher in the younger age group (>92%). In older participants (≥25 years), 90% or more in all cities reported knowing where to get an HIV test.

In the last 12 months, have you been given condoms?

At least 50% of participants in each city reported having been given free condoms as part of HIV prevention activities during the last 12 months; except in Bratislava, Warsaw and Verona where less than half of participants (regardless of age group) reported having been given condoms (Table 5.2.2). In the other cities variations were observed from 51% in Ljubljana to 95% in Sofia for men aged ≥25 years.

Among younger participants (<25 years), the highest percentages who reported having been given condoms were from Sofia and Hamburg (86% and 94% respectively). The lowest percentages were from Bratislava and Verona (23% and 29% respectively).

Table 5.2.2. Percentage of MSM who reported having been given condoms in the last 12 months.

City	Age	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Sample Size
BARCELONA	<25	64.5	49.3	79.7	1.0	41
	25+	76.8	72.7	80.9	0.9	356
BRATISLAVA	<25	22.5	17.0	22.4	1.4	117
	25+	24.4	17.4	29.0	2.1	276
BRIGHTON	<25	64.6	45.4	83.8	2.7	66
	25+	54.6	40.6	68.6	6.9	338
BRUSSELS	<25	53.6	21.7	85.4	5.1	49
	25+	65.0	57.8	72.2	2.0	338

City	Age	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Sample Size
BUCHAREST	<25	56.1	41.6	70.6	1.1	47
	25+	60.6	51.4	69.7	1.2	129
HAMBURG	<25	93.9	87.1	100	0.8	38
	25+	81.3	76.9	85.7	1.2	365
LISBON	<25	80.2	64.3	96.0	1.4	35
	25+	65.3	53.8	76.7	5.6	372
LJUBLJANA	<25	50.5	41.4	59.6	1.0	119
	25+	50.7	44.1	57.4	1.2	269
SOFIA	<25	86.2	80.7	91.7	0.8	114
	25+	95.3	89.2	100	6.4	294
STOCKHOLM	<25	75.5	60.5	90.5	2.0	65
	25+	78.9	71.1	86.7	2.5	266
VERONA	<25	29.1	16.5	40.8	2.4	99
	25+	41.1	32.0	50.5	2.8	280
VILNIUS	<25	67.4	54.4	74.4	2.2	83
	25+	32.9	24.2	38.7	1.8	237
WARSAW	<25	34.9	20.3	49.4	2.2	92
	25+	30.7	23.1	38.3	2.2	312

If you have been given condoms in the last 12 months, where did you get them from (excluding this Sialon II project)? [1]

When comparing the types of venues participants reported being given free condoms in, there were some differences between cities. For instance, in Sofia, Barcelona, Brussels, Lisbon, and Vilnius, it was common for participants to have been given condoms in saunas or night clubs/discos. However, in Hamburg, Bucharest, Verona and Warsaw, outreach services and gay organisations were the most commonly reported means of condom distribution. Compared to other cities, in Lisbon, Sofia, Brighton, and Stockholm it was more common for participants to be given condoms at drop-in-centres, sexual health clinics, and health care facilities or in other kind of venues (not specified).

Differences in where condoms were received were also evident between cities when compared by HIV status (oral fluid [OF] or blood testing results). For example, no HIV-positive men in Hamburg, Ljubljana, and Verona had been given condoms at drop-in-centres or other health care facilities; this was also relatively uncommon in Bratislava, Vilnius, Barcelona, and Warsaw. However, in contrast more than 70% of the HIV-positive men in Sofia, Brighton, and Stockholm had received condoms in such settings. Only 5% of the HIV-positive men in Stockholm had been given condoms by an outreach service whilst more than 80% of the HIV-positive men in Warsaw, Ljubljana, Sofia, Brighton, and Verona had received condoms that way.

GARPR 1.13: Percentage of MSM who received an HIV test in the past 12 months and know their results

The GARPR 1.13 indicator refers to the percentage of MSM who received an HIV test in the past 12 months and knew their results, and consists of the results from two questions included in the Sialon II survey: Have you been tested for HIV in the last 12 months?, and; If you had an HIV test in the last 12 months, did you receive the result of that test? Possible responses to both questions included 'yes', no', or 'I prefer not to answer'.

In Barcelona, Hamburg, Sofia, Stockholm, and Verona, approximately 50% or more of participants (all ages) reported having received an HIV test within the last 12 months and knew the result of that test. In Brighton, Brussels, and Warsaw more than 50% of older participants (≥25 years) reported a known HIV test within the last 12 months whilst among younger participants (<25 years), it was less than 50%. In Lisbon only 21% of younger men reported a known HIV test in the last year which represented the lowest levels in the study (see Table 5.2.3).

In several cities there were large differences between age groups (<25/≥25) with regard to receiving an HIV test within the last 12 months and knowing the results. Participants from Brighton, Brussels, Lisbon, and Warsaw all reported differences of greater than 20% for the two age groups (<25/≥25). Only in Hamburg did younger men report a clearly higher level of known HIV result from a test within the last 12 months. However, the precision of the estimate for the younger age group is questionable in many cities because the sample sizes are relatively small (<50) and sampling biases are possible.

Table 5.2.3. HIV testing weighted prevalence among MSM by city and age group (GARPR 1.13)

Numerator: Number of men who have sex with men who have been tested for HIV during the last 12 months and who know their results (answered yes to q15).
Denominator: Number of men who have sex with men included in the sample
Answers 'No' in question 14 were set to 'No' in the indicator, whilst answers 'I prefer not to answer' were set to missing. Answers 'I prefer not to answer' in question 15 were set to 'No' in the indicator. All persons who stated that they were HIV-positive were excluded from the denominator.

City	Age	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Sample Size
BARCELONA	<25	62.5	53.2	71.8	0.4	41
	25+	63.6	53.1	74.0	3.9	345
	Total	63.0	52.6	73.4	4.7	386
BRATISLAVA	<25	29.0	19.1	39.0	1.9	112
	25+	41.0	31.8	48.8	2.2	228
	Total	37.2	30.4	43.0	1.9	340
BRIGHTON	<25	36.1	22.7	49.6	1.2	63
	25+	54.6	43.9	65.3	3.3	313
	Total	47.3	43.3	51.3	0.6	376
BRUSSELS	<25	42.5	18.6	66.4	2.9	50
	25+	72.1	59.8	84.4	5.7	317
	Total	68.1	56.4	79.8	6.0	367
BUCHAREST	<25	39.0	21.8	56.2	1.6	47
	25+	44.8	32.5	57.1	2.0	122
	Total	43.3	33.1	53.5	1.9	171

City	Age	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Sample Size
HAMBURG	<25	69.5	53.0	86.0	1.1	37
	25+	53.3	41.1	65.6	5.1	350
	Total	53.6	43.4	63.7	4.2	387
LISBON	<25	21.1	12.5	29.8	0.4	34
	25+	63.3	56.0	70.6	2.0	360
	Total	60.9	53.4	68.4	2.4	394
LJUBLJANA	<25	40.1	23.5	56.6	3.4	117
	25+	47.4	41.9	53.0	0.8	256
	Total	46.4	40.5	52.3	1.4	373
SOFIA	<25	75.2	68.1	82.2	0.8	115
	25+	74.0	65.4	82.6	2.9	295
	Total	74.3	67.0	81.6	3.0	410
STOCKHOLM	<25	52.1	39.0	65.2	1.1	62
	25+	57.9	47.1	68.6	2.6	229
	Total	56.3	45.6	66.9	3.5	291
VERONA	<25	50.2	36.3	64.0	2.3	99
	25+	47.3	36.1	57.1	3.1	233
	Total	47.7	38.6	56.1	3.2	335
VILNIUS	<25	38.3	24.8	50.5	1.8	81
	25+	39.1	29.0	47.6	2.1	192
	Total	38.8	31.2	45.0	1.7	273
WARSAW	<25	37.6	27.2	48.1	1.0	91
	25+	60.6	48.6	72.6	4.5	301
	Total	54.0	45.7	62.2	2.8	392

HIV test details

In which year did you have your last HIV test (in order to detect your HIV-status)?

Table 5.2.4 presents the results of all participants who reported which year they had had their last HIV test. Overall, the majority of participants reported having been tested within the last two years (2012 and 2013) although this was particularly evident in younger participants (<25 years). In most cities, percentages of those who had never been tested were low. Only in younger participants in Bratislava, Bucharest, and Warsaw, were percentages of having never been tested over 45%.

The highest percentage of younger participants (<25years) who reported testing in 2012-2013 were from Brussels (73%). The lowest percentages of younger participants were from Lisbon and Bratislava (both 41%).

The highest percentage of older participants (≥25 years) who reported testing in 2012-2013 were from Lisbon (77%). The lowest percentages of older participants were from Bratislava (43%). N.B. Data from Sofia were missing for this question due to incorrect translation of the question.

Table 5.2.4 Percentage of study participants reporting year of last HIV test

City	Age	Levels	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Sample Size
BARCELONA	<25	<2012	24.6	10.0	39.2	1.2	40
		≥2012	67.1	56.9	77.3	0.5	
		Never tested	8.2	0	20.7	2.1	
BARCELONA	25+	<2012	24.8	15.1	34.5	4.4	337
		≥2012	69.1	57.5	80.6	5.5	
		Never tested	6.0	2.8	9.2	1.6	
BRATISLAVA	<25	<2012	8.0	1.8	14.3	2.2	118
		≥2012	41.2	30.0	51.0	1.9	
		Never tested	50.6	40.0	62.6	2.1	
	25+	<2012	24.7	17.7	30.6	2.2	282
		≥2012	43.2	35.5	50.4	2.2	
		Never tested	32.0	25.8	39.7	2.2	
BRIGHTON	<25	<2012	15	3.1	26.8	1.8	62
		≥2012	50.7	19.0	82.3	6.4	
		Never tested	34.3	13	55.5	3.2	
	25+	<2012	34	28.6	39.3	1.0	311
		≥2012	57.6	48.3	66.9	2.9	
		Never tested	8.3	2.8	13.9	3.3	
BRUSSELS	<25	<2012	0.1	0	0.5	0.1	42
		≥2012	73.0	57.6	88.5	1.3	
		Never tested	26.7	11.4	42.0	1.3	
	25+	<2012	20.1	7.01	33.2	8.7	313
		≥2012	72.4	58.9	86.0	7.5	
		Never tested	7.4	2.3	12.4	3.0	
BUCHAREST	<25	<2012	3.6	0.0	8.5	0.9	47
		≥2012	50.7	31.0	70.2	1.9	
		Never tested	45.6	26.1	65.4	1.9	
	25+	<2012	14.0	6.7	31.3	1.6	134
		≥2012	55.2	43.1	67.4	2.1	
		Never tested	30.6	19.3	41.9	2.1	
HAMBURG	<25	<2012	1.5	0	3.9	0.3	36
		≥2012	69.8	51.8	87.8	1.4	
		Never tested	28.5	10.5	46.6	1.5	
	25+	<2012	31.8	20.4	43.2	5.4	346
		≥2012	57.6	49.9	65.3	2.2	
		Never tested	10.5	2.9	18.2	5.6	
LISBON	<25	<2012	19.7	0	49.5	4.7	33
		≥2012	41.3	19.3	63.4	1.7	
		Never tested	38.9	15.3	62.5	2.0	

City	Age	Levels	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Sample Size
LISBON	25+	<2012	16.5	9.7	23.2	3.1	356
		≥2012	76.8	69.5	84.2	2.8	
		Never tested	6.6	2.7	10.4	2.2	
LJUBLJANA	<25	<2012	12.6	0	26.0	4.8	113
		≥2012	52.0	34.5	69.5	3.6	
		Never tested	35.3	20.7	49.9	2.7	
	25+	<2012	30.0	21.5	38.5	2.3	255
		≥2012	58.0	50.5	65.5	1.5	
		Never tested	11.8	6.0	17.6	2.1	
SOFIA*	<25	<2012	-	-	-	-	111
		≥2012	-	-	-	-	
		Never tested	-	-	-	-	
	25+	<2012	-	-	-	-	275
		≥2012	-	-	-	-	
		Never tested	-	-	-	-	
STOCKHOLM	<25	<2012	3.3	0	6.9	0.5	53
		≥2012	67.0	47.8	86.3	2.3	
		Never tested	29.5	11.1	47.9	2.2	
	25+	<2012	21.6	14.6	28.6	1.8	234
		≥2012	66.3	60.6	72.1	0.9	
		Never tested	12.0	6.7	17.2	1.6	
VERONA	<25	<2012	4.9	0.1	9.4	1.4	104
		≥2012	53.0	39.3	66.9	2.5	
		Never tested	41.9	27.8	56.2	2.7	
	25+	<2012	27.6	20.8	34.8	2.3	293
		≥2012	49.0	40.5	56.9	2.5	
		Never tested	23.2	15.9	30.8	2.9	
VILNIUS	<25	<2012	10.4	1.7	19.8	2.3	83
		≥2012	43.9	30.1	56.5	1.8	
		Never tested	45.5	32.1	59.4	1.9	
	25+	<2012	27.8	20.5	35.5	2.1	239
		≥2012	44.6	35.2	52.9	2.4	
		Never tested	27.5	20.9	34.8	1.8	
WARSAW	<25	<2012	2.6	0	6.0	0.9	82
		≥2012	47.7	37.7	57.7	0.8	
		Never tested	49.6	38.8	60.3	1.0	
	25+	<2012	18	7.4	28.5	5.8	293
		≥2012	72.4	61.6	83.2	4.4	
		Never tested	9.5	3.9	15.1	2.8	

* Results for Sofia are missing due to incorrect translation.

What was the result of your last HIV test?

In TLS and RDS cities, the percentage of participants reporting a positive HIV result from their last test was highest in older participants (≥25). Few younger participants (<25 years) reported a positive result from their last test (0-1.7%). Over 10% of older men (≥25 years) from Brighton and Brussels, reported having received a positive HIV test, whilst all other cities reported under 10% (Sofia as low as 0.2%).

In RDS cities, the percentage of participants reporting a positive HIV result from their last test was highest in Bucharest, both among younger (7%) and older (13%) participants.

In TLS cities, of those participants with a positive OF test, a large percentage of participants reported having a negative result at their last test. Only in Brighton, Brussels, and Hamburg did the majority of HIV-positive participants (as determined by their OF test) report that the result of their last HIV test had been positive. In Ljubljana, the percentage of participants who reported receiving a positive test result and the percentage receiving a negative test result from last testing was about the same, independent of HIV status by OF test (40%).

In the other cities (Lisbon, Sofia, Stockholm, and Warsaw) the majority of men with a positive HIV OF test reported that their last test was negative, suggesting that they did not know about their HIV infection (see also Section 5.9).

Other sexually transmitted infections

In the last 12 months, have you been tested for sexually transmitted infections other than HIV?

Among younger respondents (<25 years), the percentage of those who reported having been tested for STIs during the past 12 months varied between 27-68% (see Table 5.2.5). The highest percentages relating to younger men were reported in Hamburg (68%) and Stockholm (63%) respectively. The lowest percentages among younger participants were reported in Vilnius (23%), Bratislava (24%), and Lisbon (31%).

In all TLS cities older participants (≥25 years) reported slightly higher prevalence of STI testing (range 41-72%) compared with younger MSM. The highest percentage in this older age group was reported in Brussels (72%) and

Table 5.2.5. Percentage of study participants who reported having been tested for STIs (other than HIV) in the last 12 months

City	Age	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Sample Size
BARCELONA	<25	58.32	49.6	67.0	0.3	42
	25+	61.01	51.0	70.9	3.8	354
BRATISLAVA	<25	23.62	19.9	25.7	1.8	118
	25+	30.16	23.6	35.4	1.9	281
BRIGHTON	<25	49.6	39.2	59.9	0.7	66
	25+	60.39	49.7	71.0	4.2	340
BRUSSELS	<25	38.7	23.4	53.9	1.2	50
	25+	72.23	63.3	81.0	3.4	338
BUCHAREST	<25	42.88	19.0	66.7	2.9	47
	25+	37.89	29.7	46.0	0.9	134
HAMBURG	<25	68.55	48.3	88.7	1.8	37
	25+	52.19	35.7	68.6	10.3	364

City	Age	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Sample Size
LISBON	<25	31.04	8.4	53.6	2.1	35
	25+	53.9	45.7	62.0	2.6	372
LJUBLJANA	<25	37.24	20.6	53.8	3.7	120
	25+	43.72	37.9	49.5	1.0	270
SOFIA	<25	36.66	21.8	51.4	2.8	115
	25+	40.73	32.4	49.0	2.2	296
STOCKHOLM	<25	63.41	51.8	74.9	1.0	65
	25+	60.71	51.3	70.0	2.5	266
VERONA	<25	40.85	27.0	54.6	2.8	103
	25+	36.78	28.0	45.1	2.6	286
VILNIUS	<25	22.68	12.1	29.3	2.0	83
	25+	27.23	19.7	33.8	1.9	239
WARSAW	<25	42.18	33.2	51.1	0.8	90
	25+	55.29	43.6	66.8	4.4	312

the lowest in Sofia (41%). In RDS cities, older participants reported lower prevalence of STI testing compared with younger MSM, with the lowest percentage reported in Vilnius (27%) and the highest in Bucharest (38%).

In the last 12 months, have you been diagnosed with the following? [2]

Syphilis

In general, prevalence of self-reported syphilis during the past 12 months was low in all cities (0-6%) with some exceptions. In Sofia for example, younger participants (<25 years) reported the highest syphilis prevalence (19.1%; 5 syphilis cases out of 41 respondents). Notably, no cases of syphilis were reported by younger participants in Barcelona, Brighton, Brussels, Hamburg, Lisbon, Bucharest, or Verona. Prevalence of self-reported syphilis was reported to be somewhat higher among HIV-positive study participants, but in general numbers were low with the highest percentage observed in Hamburg where 45% of HIV-positive individuals reported having had syphilis.

Gonorrhoea

Although prevalence of self-reported gonorrhoea was relatively low in both age categories (<25/≥25; range 0-11%), prevalence was generally higher in older participants (≥25 years) compared to younger participants (<25 years). The exceptions however, were in Vilnius, Ljubljana and Hamburg where prevalence was as high as 22.2% (4 cases out of 21 respondents), 14% (4 cases out of 50 respondents), and 2 cases out of 20 respondents respectively among younger participants (<25 years).

Chlamydia infection

Prevalence of self-reported chlamydia was low in both age categories (<25/≥25; below 11%) in all cities. The exceptions were in Brighton and Ljubljana where prevalence among younger participants (<25) was as high as 27.2% (7 cases out 46 respondents) and 14.9% (4 cases out of 49 respondents) respectively. Chlamydia prevalence was quite low in all RDS cities (3-5%) irrespective of age group with Bucharest reporting no cases at all.

Anogenital warts

In general, prevalence of self-reported anogenital warts was very low (< 8%) in both age categories and in all

TLS and RDS cities. However, Sofia and Hamburg were notable exceptions with prevalence of 21.4% (18 cases among 118 respondents) among older participants (≥25), and 50.5% (4 cases among 20 respondents) among younger participants (<25 years) respectively.

Genital herpes

Prevalence of self-reported genital herpes was very low (< 9%) in both age categories and in all TLS and RDS cities. However, Sofia was a notable exception with a prevalence of 10.3% (3 cases out of 39 respondents) among younger participants (<25 years).

Lymphogranuloma venereum (LGV)

In general prevalence of self-reported LGV was extremely low (0-0.3%) in both age categories and all TLS cities with only three cases of LGV reported. No cases of LGV were reported in RDS cities.

Urethral outflow/itching

Self-reported prevalence of urethral outflow/itching was generally very low range with the exception of some TLS cities. The highest observed percentages were in Sofia (22.2%; 6 cases out of 38 respondents) and in Bucharest (8%; 3 cases out of 19) both among younger participants (<25 years).

Hepatitis B

Self-reported prevalence of hepatitis B was low ranging between 0-8% in the majority of the TLS and RDS cities. Exceptions were seen in older participants (≥25 years) from Ljubljana (11.6%; 8 cases reported out of 108 respondents) as well as in younger participants (<25 years) from Lisbon (15%; 1 case out of 13 respondents).

Hepatitis C

Self-reported prevalence of hepatitis C varied by TLS and RDS cities and age category (<25/≥25 years) with a total 18 cases reported in TLS cities, and 26 cases reported in RDS cities. The highest prevalence of hepatitis C was reported among young participants (<25 years) in Lisbon (14.7%; 1 reported case out of 13 respondents) and among participants over 25 years in Bucharest (31%; 15 cases out of 43). All remaining cities reported prevalence below 9%.

Request of community based HIV testing

Would you like access to HIV/STI testing at gay venues?

In RDS cities only, MSM were asked whether they would like to access HIV/STI testing in gay venues. High percentages of participants from all RDS cities reported that would like to access testing at gay venues. The highest frequency was reported in Verona with 58% of younger and 58% of older participants expressing this view, followed by 59% of older participants in Vilnius. A relatively lower number of older respondents (≥25 years) in Bratislava reported that they would be interested in such an activity (47%). A small percentage of participants reported that they were not interested in accessing testing in gay venues (11-19%). The highest percentage was reported by older participants (≥25 years) from Bucharest.

Summary and conclusions

- There are differences between the cities when comparing whether men had been reached by prevention programmes (GARPR indicator 1.11). Although most of the men in the survey (both TLS and RDS) report knowing where to go to get an HIV test, the percentage of men that had been given condoms during the last

12 months varied between the cities from less than half to almost all men. Thus there seems to be room for improvement in some cities when it comes to condom distribution.

- Differences between the cities in terms of the types of venues and settings where free condoms are distributed were evident. For instance, the extent of outreach activities and routines for providing condoms in health care settings and the type of venues sampled in the study varied considerably. Thus comparing the cities is challenging and means that strategies for condom distribution should be developed taking into consideration the local context.
- Older participants (≥25 years) tested more recently and to a higher extent than younger participants (<25 years). This might indicate that a larger group of young MSM are potentially not aware of their HIV status.
- The percentage of participants receiving their result after being HIV tested was high in all TLS and RDS cities.
- The majority of the participants reported having tested within the last two years (2012 and 2013) and this was particularly evident in younger participants (<25 years).
- Few younger men (<25 years) reported having received a positive HIV result from their last test.
- Prevalence of self-reported STIs in general was low in TLS and RDS cities. Chlamydia and gonorrhoea were the most commonly reported STIs during the past 12 months.
- Most participants from the RDS cities were open to being offered HIV/STI testing at gay venues.

Endnotes

[1] When interpreting these responses, it is of course possible that differences in health care systems between the participating countries could explain where and how free condoms are distributed. Also, the type of setting may affect how participants perceive who actually distributes the free condoms e.g. in a nightclub or sauna (an outreach service/gay organisation or the club owner) and this could, at least partly, explain differences in how participants responded to these questions.

[2] The question asked in which year the participants had their last HIV test, disregarding HIV status. In all cities self-reported negative men reported having had their last test in 2012-2013 rather than before. Also the majority of the self-reported HIV-positive men were tested 2012-2013 in all cities except for Brighton and Warsaw. It remains unclear whether men aware of being HIV-positive referred to HIV antibody tests or HIV viral load tests when answering this question.

[3] Due to possible confusion between *testing* and *diagnosis* of STIs by participants in responding to this question on diagnosed STIs, it was decided to set answers to missing if respondents had indicated having been diagnosed with all three serologically diagnosed infections (HBV, HCV, Syphilis) *or* all three swab-diagnosed infections (Chlamydia, Gonorrhoea, LGV) in the previous 12 months. Consequently, 52 answers were set to missing in the TLS arm and 3 in the RDS arm, and are therefore excluded from both the nominator and the denominator. The denominator for this question includes only those respondents who had indicated having been tested for the respective STI. Small sample sizes, particularly when looking at the lower age strata, should be kept in mind when interpreting reported prevalence.

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5.3 / 5.4 Partner numbers, anal intercourse, and condom use with steady and non-steady partners in the last six months

Summary

Anal intercourse without a condom in the previous six months was reported by approximately half of the study participants, slightly more often by men living in the Central European study cities. In addition unprotected anal intercourse was reported more frequently with steady partners compared to non-steady partners.

The association between age, condom use and partner type was not consistent across the study cities. In most cities, condom use with a steady partner was lower for younger men than for men 25 years and older, but sample sizes for younger men living in steady relationships were small for several cities.

The effect of knowledge of HIV status on condom use differed by partner type: reported condom use was lowest among HIV negative respondents having anal sex with a steady partner and highest among HIV negative respondents having anal sex with a non-steady partner. Among respondents aware of being infected with HIV, condom use with steady partners was higher than among HIV negative men, however, condom use with non-steady partners was lower. Men unaware of being infected with HIV reported the lowest condom use with non-steady partners.

The percentage of study participants reporting more than one UAI partner in the previous six months varied across cities with high frequency reported in almost all Eastern European cities. High numbers of partners with whom condomless AI was practiced were reported most frequently by study participants infected with HIV, regardless of whether they knew to be HIV infected or not. However, almost half of the individuals unaware of being infected with HIV reported only one or no UAI partner in the previous six months.

Reporting a STI diagnosis in the previous 12 months was also associated with a higher number of sex partners in the previous six months: more than one third of all STIs reported were diagnosed in men reporting more than 10 partners, while among men without STIs less than one MSM in five reported more than 10 partners.

Introduction

This section provides a description of the findings on sexual behaviour in the last six months with male steady and non-steady partners.

The number of sexual partners appears to be important for MSM with regards to sexual satisfaction and risk for STIs including HIV (associations with HIV status). As reported from the European MSM Internet Survey (EMIS), respondents' satisfaction with their sex life was high for many men currently living in a steady relationship with a male partner; otherwise satisfaction increased with the number of non-steady sexual partners (Bourne et al., 2013; EMIS, 2013).

The risk for STIs increases with the number of different partners. Due to more restricted modes of transmission for HIV (sexually transmitted among MSM primarily through unprotected anal intercourse [UAI]), the risk for HIV depends on the number of partners, but also on sexual practices, condom use for anal intercourse [AI], knowledge of own and partner's HIV serostatus, and other factors which may influence the probability of HIV acquisition and transmission. HIV risk management among MSM has diversified over time and in addition to condom use, now includes tactics and strategies such as: negotiated safety (e.g. partnership agreements to reduce the risk of HIV acquisition from non-steady partners [NSP] and allowing condomless sex with a steady partner [SP]); HIV serosorting (deciding about condom use for AI with a SP or NSP based on assumed HIV

serostatus concordance); strategic positioning (choice of sexual role during AI based on the HIV transmission risks involved); viral sorting (taking viral load under effective antiretroviral treatment into account), and others (Matser et al., 2014; Snowden et al., 2014; Cassels et al., 2013; van den Boom et al., 2014; Mitchell et al., 2013; Vallabhaneni et al., 2012; McDaid et al., 2012; Prestage et al., 2013; Dubois-Arber et al., 2012; McFarland et al., 2012; McFarland et al., 2011; Lattimore et al., 2011; McDaid et al., 2010; Anglemyer et al., 2013). Accurate knowledge of own or own and partners' HIV status is a critical factor for the efficacy of most of these risk management tactics and strategies, except condom use.

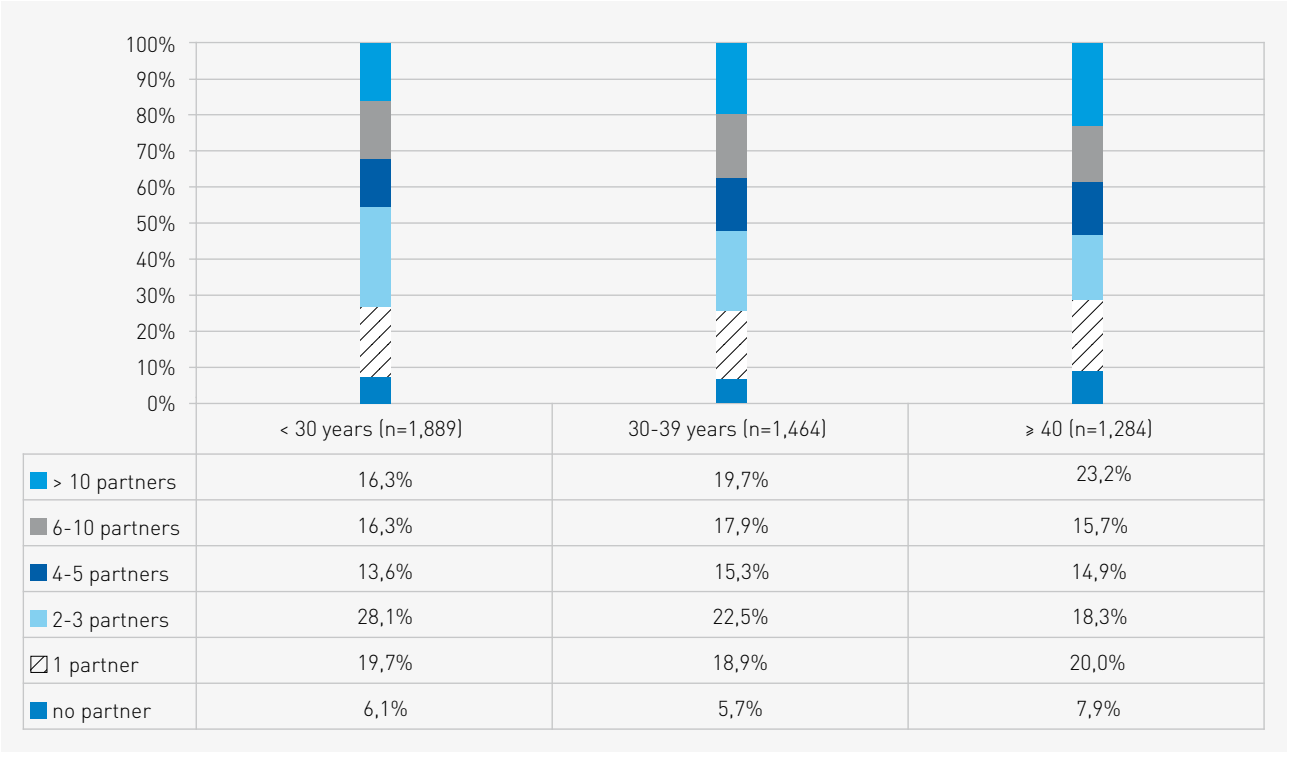
In these two sections (5.3 and 5.4), data on partner numbers, AI, and condom use with SP and NSP in the last six months is presented.

Results

Partner numbers in the last six months by age (unweighted) [1]

In the survey (both the TLS and RDS arms), participants were asked to report (or estimate) the number of SP and NSP they had had in the previous six months. Response options included: the number of partners (or zero if none) and 'I prefer not to answer'. The proportion of respondents reporting more than ten partners in the previous six months increased with age (Figure 5.3.1). Lower partner numbers were more frequently reported by men younger than 30 years. Although the effects of possible misinterpretation of some questions by participants were minimised by setting inconsistent answers to missing, misunderstanding of the time period (last six months) and reporting lifetime partner numbers instead, might have continued to have an effect. The increase of partner numbers with age may partly reflect the report of lifetime partner numbers which of course increase with age. An alternative explanation would be that participants older than 44 years were more frequently recruited in venues with higher partner numbers (e.g. saunas) which could explain the higher partner numbers. Thus the association between partner number and age could be confounded by misinterpretations and sampling effects.

Figure 5.3.1 Partner numbers in categories in the last six months and age group (n=4,637)



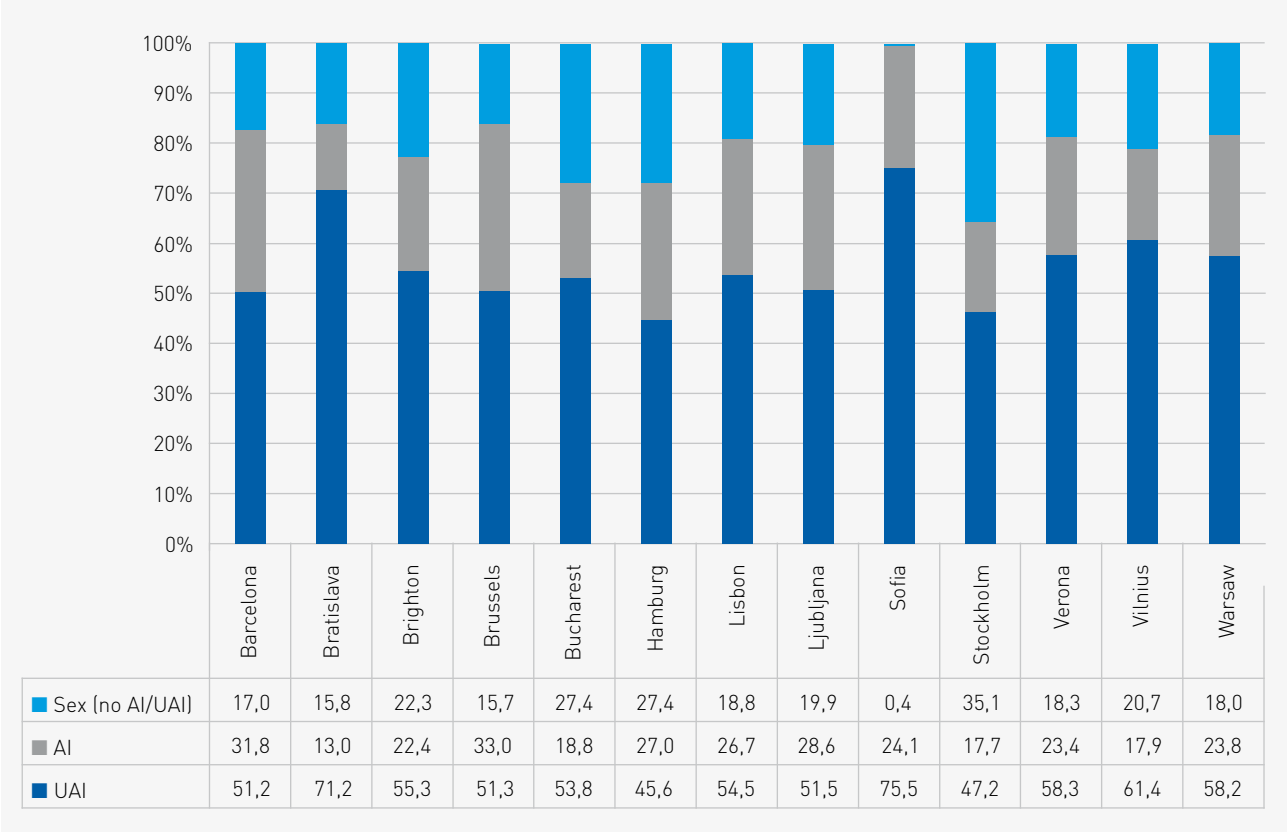
	< 30 years (n=1,889)	30-39 years (n=1,464)	≥ 40 (n=1,284)
> 10 partners	16,3%	19,7%	23,2%
6-10 partners	16,3%	17,9%	15,7%
4-5 partners	13,6%	15,3%	14,9%
2-3 partners	28,1%	22,5%	18,3%
1 partner	19,7%	18,9%	20,0%
no partner	6,1%	5,7%	7,9%

Anal intercourse and unprotected anal intercourse

Participants were also asked to report (or estimate) the number of partners (SP and/or NSP) with whom they had had AI, and then the number of partners with whom this intercourse had been unprotected i.e. condomless AI or UAI. For both questions response options included: the number of partners (or zero if none) and 'I prefer not to answer'.

Approximately half of all participants reported condomless AI (Figure 5.3.2), with Sofia (75.5%) and Bratislava (71.2%) reporting the highest, and Stockholm (47.2%) and Hamburg (45.6%) reporting the lowest proportions (median 54.5%). Any type of AI was reported by approximately 80% from all study sites, again with Sofia leading with 99.6% of all participants engaging in any AI, and Bucharest (72.6%), Hamburg (72.6%), and Stockholm (64,9%) lagging (see Figure 5.3.2).

Figure 5.3.2 Type of sexual practice by city (weighted)



	Barcelona	Bratislava	Brighton	Brussels	Bucharest	Hamburg	Lisbon	Ljubljana	Sofia	Stockholm	Verona	Vilnius	Warsaw
Sex (no AI/UAI)	17,0	15,8	22,3	15,7	27,4	27,4	18,8	19,9	0,4	35,1	18,3	20,7	18,0
AI	31,8	13,0	22,4	33,0	18,8	27,0	26,7	28,6	24,1	17,7	23,4	17,9	23,8
UAI	51,2	71,2	55,3	51,3	53,8	45,6	54,5	51,5	75,5	47,2	58,3	61,4	58,2

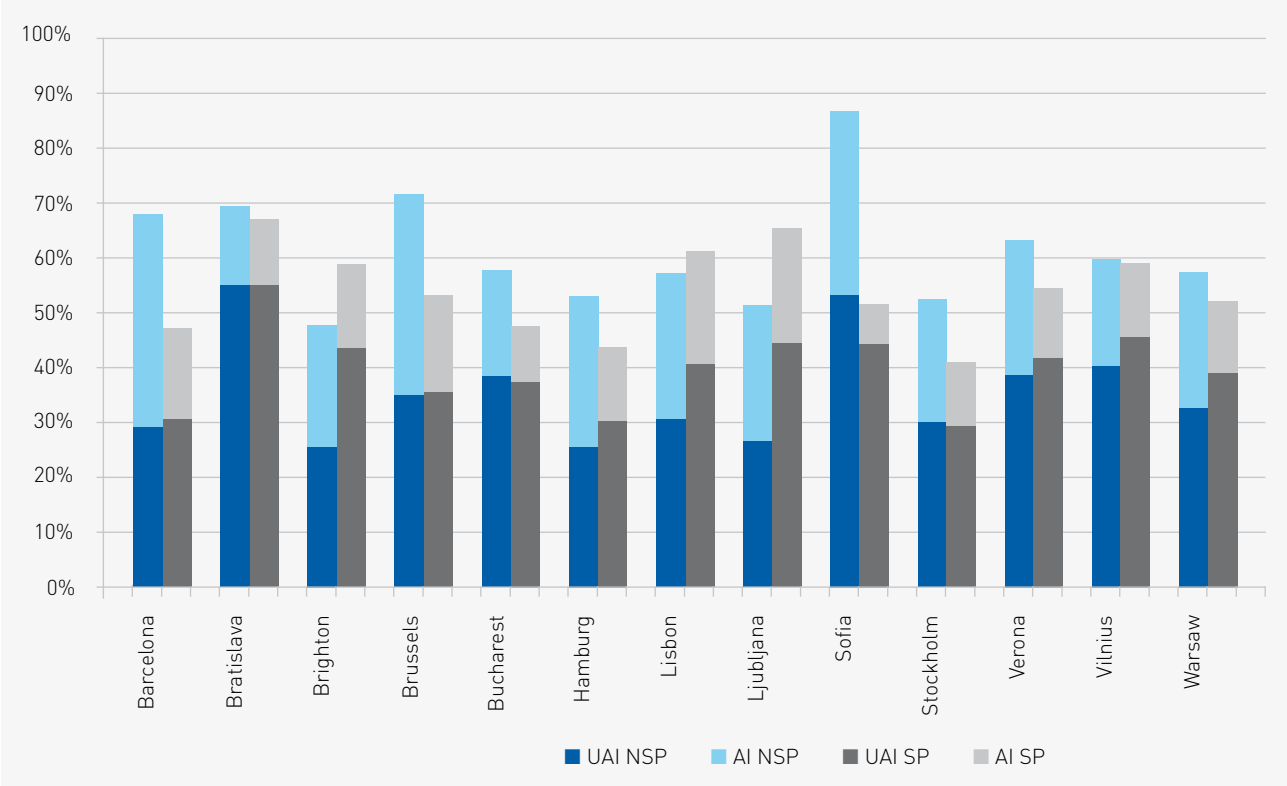
Anal intercourse with a *steady* partner with and without condoms

Between 30.3% and 55.6% of respondents from TLS and RDS cities reported UAI with a SP in the previous six months, and an additional 7.2% to 20.8% reported AI with condoms. Across all cities, approximately one in three to one in four of participants reported exclusively condom-protected AI with their SP. Only in Sofia was the proportion significantly lower. Most of the respondents not reporting AI with a SP did so because they had not had a SP in the previous six months (Figure 5.3.3).

Anal intercourse with a *non-steady* partner with and without condoms

About one third of the respondents from all cities reported UAI with a NSP in the previous six months (median 33.5%). In Sofia and Bratislava respectively, this proportion reached 54.0% and 55.8%. An additional 14.2%

Figure 5.3.3 Condom use and anal intercourse with steady and non-steady partners by city (weighted)



to 38.3% reported condom-protected AI (median 24.5%) in the different cities. Thus, in the Western European cities close to 50% of the participants reporting AI with NSPs reported exclusively condom-protected AI; in the Central European cities and in Stockholm this proportion was lower.

Overall, proportions of respondents reporting any AI with a NSP were highest in Sofia (87.1%) and lowest in Brighton (48.4%), Ljubljana (52.0%), Stockholm (53.1%) and Hamburg (53.6%). Those not reporting AI with a NSP in the previous six months either had no anal sex with their NSP or had sex only with their SP (Figure 5.3.3).

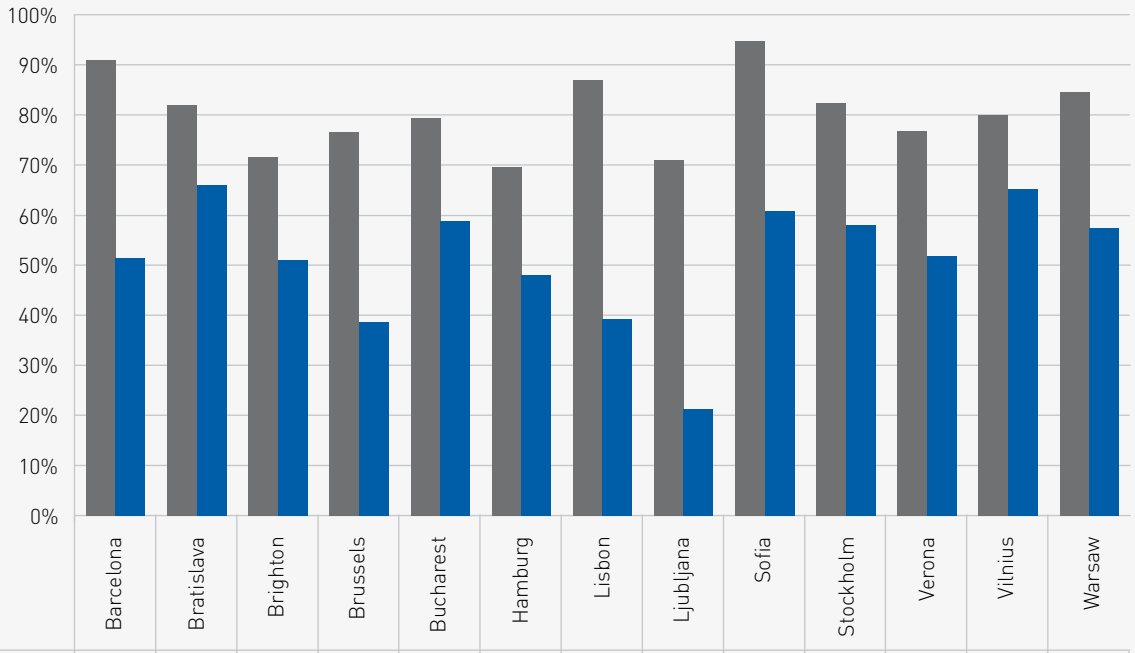
Anal intercourse and unprotected anal intercourse, by steady and non-steady partners

Among participants reporting anal sex with their partners, UAI was reported to be much more frequent with SPs (ranging from 70.0% in Hamburg to 95.3% in Sofia) than with NSPs (ranging from 21.4% Ljubljana to 66.3% in Bratislava). The proportion of participants using condoms consistently for AI with their SP was particularly low in the Southern European cities of Barcelona and Lisbon, as well as in Sofia (Figure 5.3.4).

Consistent condom use for AI with NSPs was highest in Ljubljana, Brussels and Lisbon and lowest in Bratislava, Vilnius, Sofia, and Bucharest (Figure 5.3.4).Thus, the proportion of respondents reporting UAI with SPs was higher than the proportion reporting UAI with NSP. This strongly suggests that knowing the partner better is associated with less condom use for AI. This may be due partly to a better HIV serostatus knowledge of the SP, and/or partly due to feeling less at risk for HIV infection when the partner is a SP.

Condom use with SP and NSPs varied considerably between age groups and between cities. In Brighton, Brussels, Hamburg, Ljubljana, and Sofia the proportion of respondents reporting UAI with NSPs increased with age. In Barcelona, Bratislava, Bucharest, and Warsaw the proportion decreased, and in Lisbon, Stockholm, Vilnius, and Verona there was not much difference. Since the proportion of participants less than 25 years of age recruited in the different cities varied considerably, these different trends may be confounded partly by sampling biases.

Figure 5.3.4 Unprotected anal intercourse with steady and non-steady partners (weighted)



	Barcelona	Bratislava	Brighton	Brussels	Bucharest	Hamburg	Lisbon	Ljubljana	Sofia	Stockholm	Verona	Vilnius	Warsaw
UAI with SP	91,5%	82,4%	71,9%	76,9%	79,9%	70,0%	87,5%	71,3%	95,3%	82,8%	77,2%	80,4%	85,0%
UAI with NSP	51,7%	66,3%	51,3%	38,9%	59,1%	48,1%	39,4%	21,4%	61,1%	58,3%	52,1%	65,5%	57,7%

Partner types in the last six months [1]

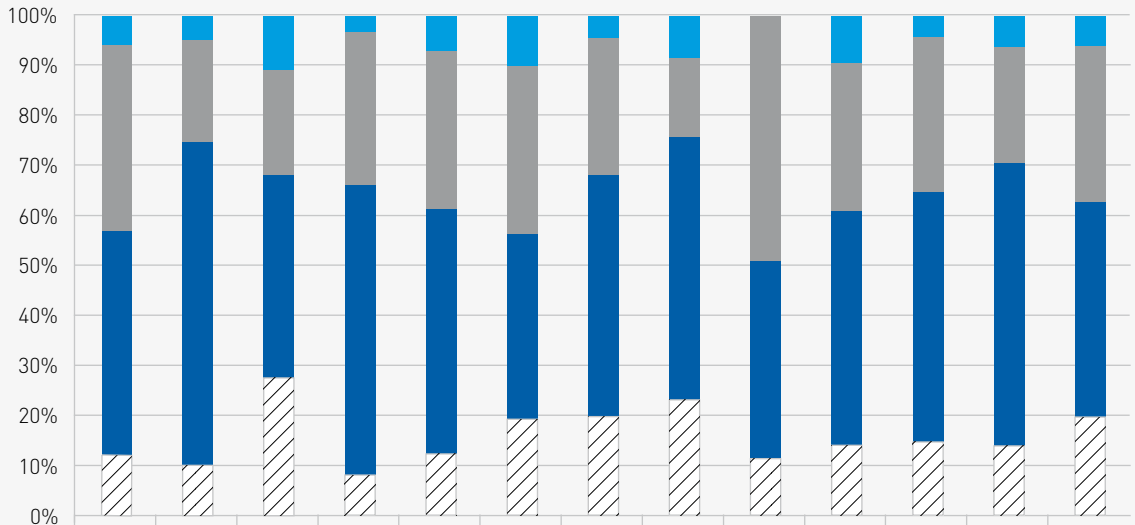
There were some differences between cities as well as between age groups regarding the different partner types reported for the previous six months. Overall the most frequently reported partner type category was a combination of SPs and NSPs, ranging from between 36.2% in Hamburg up to 64.7% in Bratislava (median 47.1%). The second most frequent category of partner type were NSPs only, ranging from 15.4% in Ljubljana up to 47.7% in Sofia (median 29.6%). Exclusively steady partners were reported in a range from 10.6% in Brussels up to 29.5% in Brighton (median 16.2%; Figure 5.3.5).

The exclusive SP category was higher for younger MSM (<25 years) in Brussels, Warsaw, Lisbon, and Brighton, and lower for younger men in Sofia, Hamburg, Barcelona, and Stockholm. In Ljubljana there was no real difference by age group. Having no partners was particularly common among young MSM in Brussels (14.2%), Brighton (21.7%), and Ljubljana (14.7%), but was not reported in Sofia and Barcelona (both 0%). These differences, particularly in the younger age group, are likely due to differences in the composition of the samples. The segments of young MSM reached by the study appear to be quite different in the different cities.

Condom use with SP, NSP, and female partners by known HIV status (unweighted) [2]

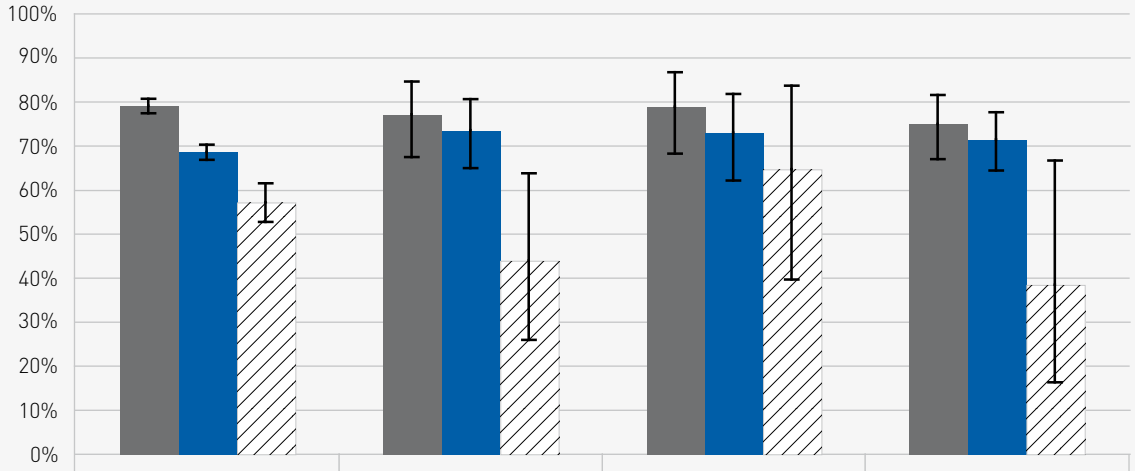
The impact of knowledge of HIV status (never tested/ previously tested negative; unaware of positive HIV status; aware of HIV-positive status) on condom use with the steady partner was small. Among respondents who were aware of being HIV positive, 75% (unweighted) reported UAI with their steady partner. Among respondents not suspecting an HIV infection and testing negative for HIV, the proportion using no condoms for AI with their SP was 79.1% (unweighted). Not reflected in this type of analysis are additional risk management tactics or strategies such as HIV serosorting (opting for UAI with partners who are presumed to have the same HIV serostatus), and decisions not to use condoms when the viral load becomes undetectable due to effective antiretroviral treatment. It would thus be misleading to assume that all respondents not reporting condom use with their SP are at risk for HIV infection or transmission because most of them are probably not at risk.

Figure 5.3.5 Partner types by city (weighted)



	Barcelona	Bratislava	Brighton	Brussels	Bucharest	Hamburg	Lisbon	Ljubljana	Sofia	Stockholm	Verona	Vilnius	Warsaw
No partner	5,5	4,6	10,4	3,1	6,8	9,6	4,3	8,1	0,0	9,0	4,0	6,1	5,7
Non-steady partner(s)	36,3	19,9	20,5	29,6	30,7	32,8	26,6	15,4	47,7	28,9	30,3	22,4	30,5
Steady&non-steady partner(s)	45,2	64,7	39,6	56,7	47,8	36,2	47,1	51,2	39,9	46,8	48,7	55,4	41,9
Steady partner(s)	13,0	10,8	29,5	10,6	14,8	21,4	22,0	25,3	12,4	15,3	17,1	16,2	21,9

Figure 5.3.6 Condomless anal/vaginal intercourse with steady, non-steady and female partners by HIV status (unweighted)



	Known or assumed HIV negative	As yet undiagnosed HIV positive	Indeterminate HIV positive	Known HIV positive
UAI with SP	79,1%	77,2%	78,9%	75,0%
UAI with NSP	68,6%	73,6%	73,1%	71,5%
UVAI female partner(s)	57,2%	44,0%	64,7%	38,5%

Knowledge of HIV status also had very little impact on condom use for anal sex with NSPs. Independent of knowledge about HIV status, any anal sex without condoms with NSPs was reported by about two thirds of the respondents. Again, these relatively minor differences regarding proportions reporting UAI cannot be interpreted as knowledge about HIV status not having an impact on risk or risk behaviour. As with SPs, for NSPs risks associated with UAI may be modified by HIV serosorting and reduced infectivity by effective antiretroviral treatment.

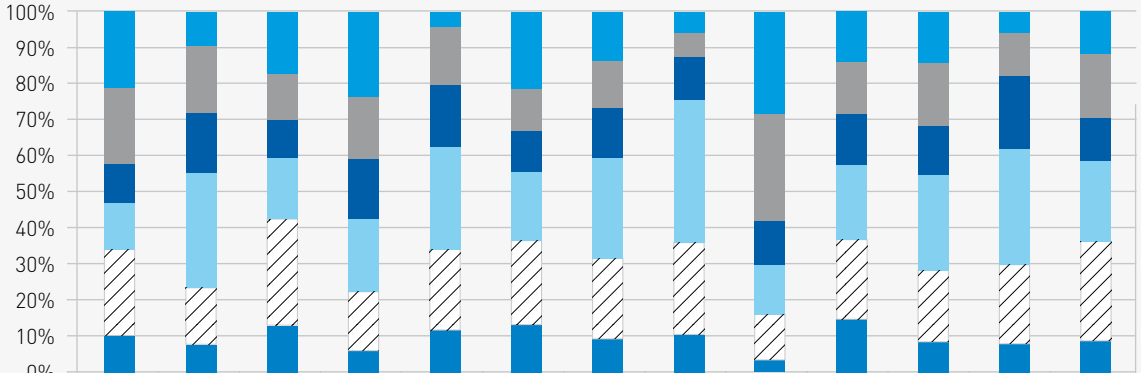
When comparing reported UAI with SP and NSPs by awareness of HIV status, the difference was statistically significant only for HIV negative respondents. However, not considered in this comparison is the number of partners with whom UAI was practiced.

In contrast, when looking at sex without condoms with female partners, a different association with HIV serostatus knowledge can be observed. 38.5% of respondents aware of being infected with HIV reported condomless sex with women, while 57.2% of HIV negative and unsuspecting respondents did so. However, due to the low numbers of HIV-positive MSM (either diagnosed in Sialon II or diagnosed previously) reporting sex with female partners, the confidence intervals are broad and the differences between male steady and non-steady partners are not statistically significant.

Partner numbers by city [1]

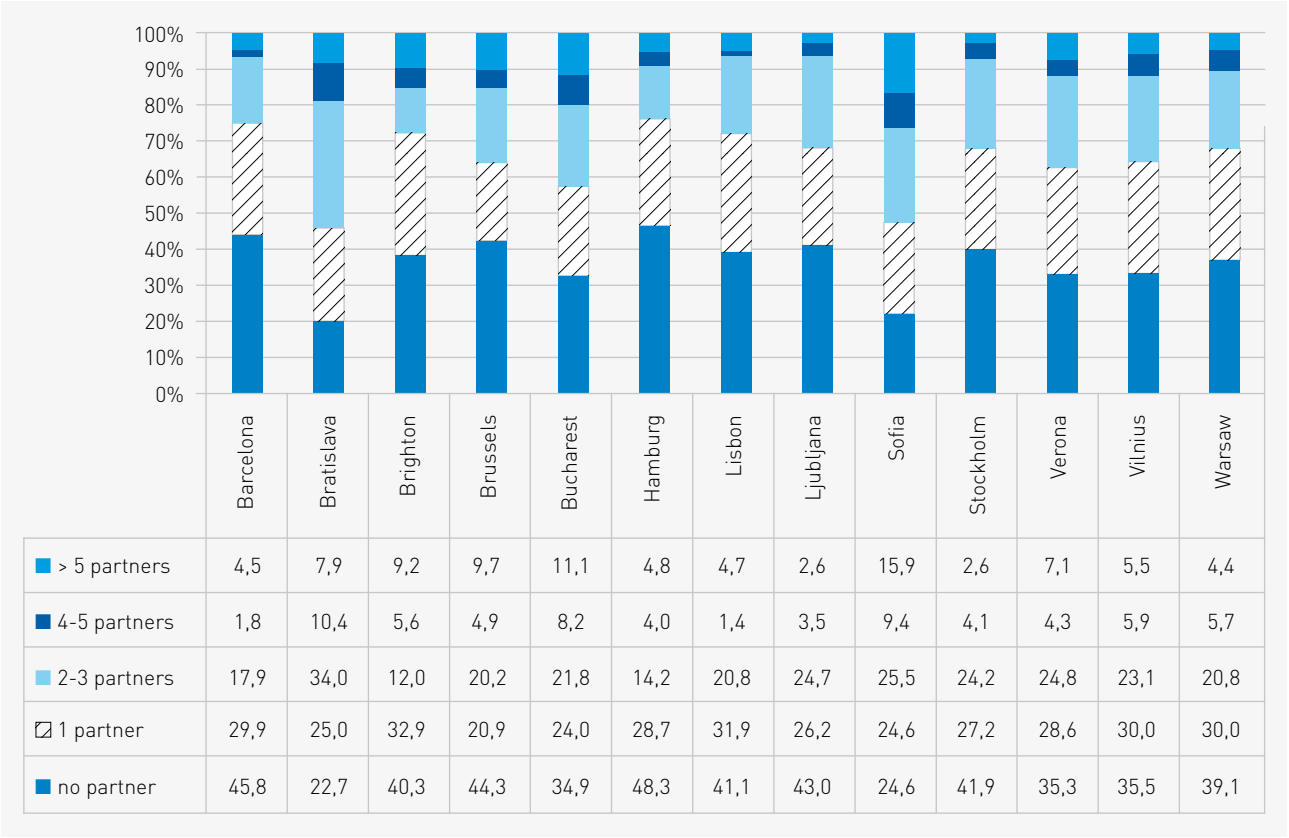
There was some variation in the numbers of sexual partners reported overall reported by participants between cities. 59.5% of respondents from Sofia reported six or more partners in the previous six months, while 12.9% in Ljubljana did so. In most cities the proportion was about one third (median 30.6%). The proportion of men reporting one or no sex partner in the previous six months was lowest in Sofia with 12.9% and highest in Brighton with 41.1% (median 32.4%; Figure 5.3.7).

Figure 5.3.7 Partner numbers in categories in the last six months by city (weighted)



	Barcelona	Bratislava	Brighton	Brussels	Bucharest	Hamburg	Lisbon	Ljubljana	Sofia	Stockholm	Verona	Vilnius	Warsaw
> 10 partners	21,7	9,5	17,5	24,1	4,3	21,8	13,8	5,8	29,1	14,2	14,4	5,8	12,0
6-10 partners	21,3	19,2	13,1	17,8	16,4	12,0	13,5	7,1	30,4	14,8	18,1	12,3	18,0
4-5 partners	11,2	17,1	11,0	16,9	17,8	11,8	14,2	12,1	12,7	14,4	13,9	20,7	12,4
2-3 partners	13,4	32,7	17,3	20,8	29,1	19,6	28,6	40,7	14,1	21,3	27,2	33,2	22,8
1 partner	24,5	16,1	30,2	16,8	23,0	23,8	22,9	26,1	13,0	22,7	20,4	22,5	28,4
no partner	7,9	5,4	10,9	3,6	9,5	11,1	7,0	8,2	0,7	12,5	6,2	5,5	6,4

Figure 5.3.8 Number of UAI partners during the last 6 months in categories by city (weighted)



	Barcelona	Bratislava	Brighton	Brussels	Bucharest	Hamburg	Lisbon	Ljubljana	Sofia	Stockholm	Verona	Vilnius	Warsaw
> 5 partners	4,5	7,9	9,2	9,7	11,1	4,8	4,7	2,6	15,9	2,6	7,1	5,5	4,4
4-5 partners	1,8	10,4	5,6	4,9	8,2	4,0	1,4	3,5	9,4	4,1	4,3	5,9	5,7
2-3 partners	17,9	34,0	12,0	20,2	21,8	14,2	20,8	24,7	25,5	24,2	24,8	23,1	20,8
1 partner	29,9	25,0	32,9	20,9	24,0	28,7	31,9	26,2	24,6	27,2	28,6	30,0	30,0
no partner	45,8	22,7	40,3	44,3	34,9	48,3	41,1	43,0	24,6	41,9	35,3	35,5	39,1

UAI partner numbers by city

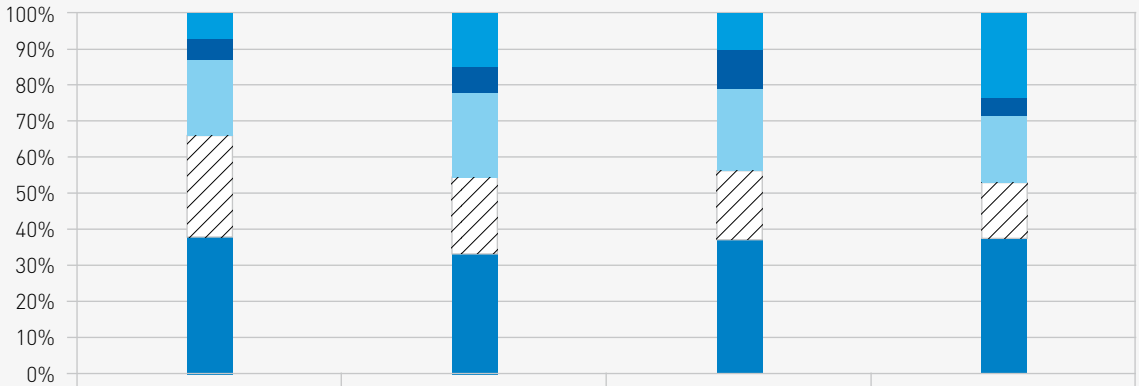
Between 22.7% (Bratislava) and 48.3% (Hamburg) of respondents reported no UAI with sex partners in the previous six months; the lowest partner numbers were reported from Bratislava and Sofia with less than 25%. Overall, UAI with not more than one partner was reported by 47.7% of the respondents from Bratislava; 49.2% from Sofia; up to 75.7% from Barcelona and 77% from Hamburg. UAI with five or more partners in the previous six months were reported by 2.6% in both Ljubljana and Stockholm of the respondents up to 15.9% in Sofia (median 5.5%; Figure 5.3.8).

UAI partner numbers and knowledge of HIV status (unweighted) [2]

Awareness of being HIV positive was associated with higher numbers of partners with whom no condoms were used during AI. Among respondents aware of being HIV-positive, 23.5% reported more than five UAI partners in the previous six months compared with just 7.0% among HIV negative respondents. Compared with HIV negative respondents, respondents unaware of their HIV positive status reported more UAI partners in the previous six months. Having had UAI with more than one partner was reported by 45.3% of as yet undiagnosed participants compared to 33.9% among those testing HIV negative (Figure 5.3.9).

On the other hand, it is notable that one third of the men with as yet unknown HIV infection reported no UAI partner in the previous six months. Whilst this relatively high proportion may be biased by underreporting of UAI, it does still suggest that a high proportion of the as yet undiagnosed HIV infections will be found in men with relatively low partner numbers. Low partner numbers may also be the reason why these men do not feel at risk for HIV and do not test for HIV more frequently. This represents a considerable challenge for avoiding late HIV diagnosis in this group.

Figure 5.3.9 HIV status knowledge and number of UAI partners (unweighted)

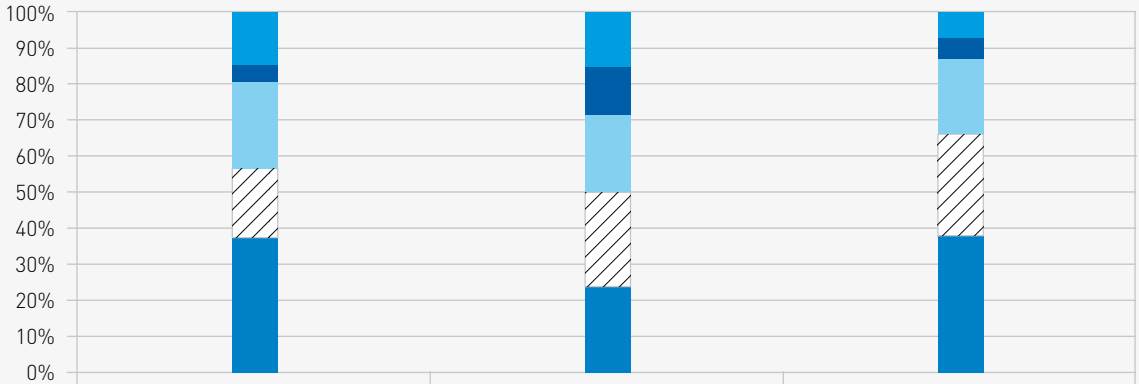


	Known or assumed HIV negative (n=3,810)	As yet undiagnosed HIV positive (n=150)	Indeterminate HIV positive (n=110)	Known HIV positive (n=226)
> 5 partners	7,0%	14,7%	10,0%	23,5%
4-5 partners	5,9%	7,3%	10,9%	4,9%
2-3 partners	21,0%	23,3%	22,7%	18,6%
1 partner	28,2%	21,3%	19,1%	15,5%
no partner	38,0%	33,3%	37,3%	37,6%

Number of UAI partners in the last 6 months and recency of as yet undiagnosed HIV [2]

Looking at the association between reported UAI partner numbers and as yet undiagnosed HIV infection, undiagnosed HIV infection is less prevalent among respondents reporting fewer than two UAI partners in the previous six months; it is more prevalent among respondents reporting more than one UAI partner in the previous six months (Figure 5.3.10). If the association is not biased by unreported risks in the group reporting low

Figure 5.3.10 Number of UAI partners in the last 6 months and newly diagnosed HIV (unweighted)



	Incident (n=104)	As yet undiagnosed (n=46)	HIV negative (n=3,810)
> 5 partners	14,4%	15,2%	7,0%
4-5 partners	4,8%	13,0%	5,9%
2-3 partners	24,0%	21,7%	21,0%
1 partner	19,2%	26,1%	28,2%
no partner	37,5%	23,9%	38,0%

numbers of UAI partners, this observation suggests that a large proportion (56.7% of incident HIV infections and 50% of as yet undiagnosed infections with unknown duration) of undiagnosed HIV infections could be found in men with relatively low levels of risky sexual behaviour (≤1 UAI partner in the previous six months); which may contribute to low testing rates in this group. On the other extreme, about 19% of incident (as yet undiagnosed infections in men who reported a preceding negative HIV test result within the previous 12 months) and 28% of other as yet undiagnosed HIV infections were found in a subgroup of men who report four or more UAI partners in the previous six months. Such an UAI frequency would make any effective HIV status knowledge-based risk management challenging even with extremely frequent testing.

If almost 20% of incident HIV infections are detected among men reporting four or more UAI partners in the previous six months, this suggests that the risk of acute phase forward transmission to other sex partners is high in this subgroup of participants.

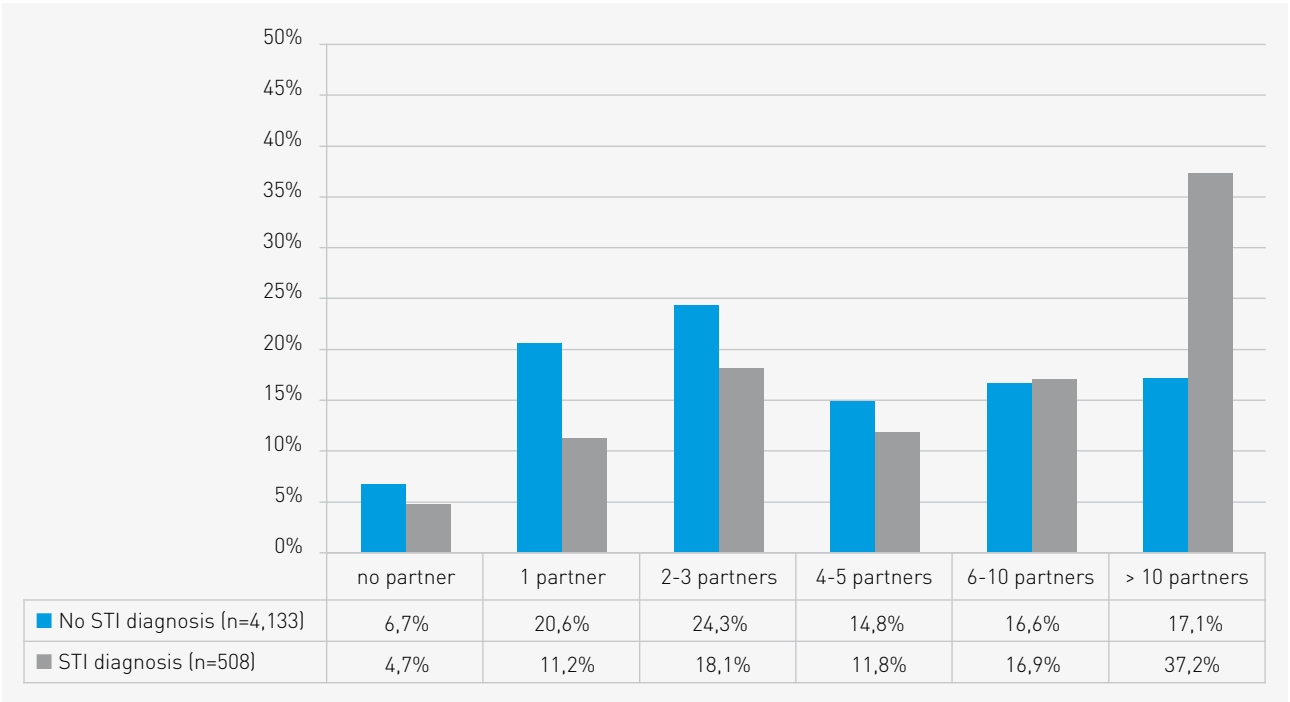
As yet undiagnosed and incident HIV and partner types in the previous six months [2]

Looking at the association between reported partner types (SP/NSP) and undiagnosed HIV infection, the prevalence of incident and as yet undiagnosed HIV was highest among men reporting SP as well as NSPs in the previous six months (4%). The proportions were only slightly lower (3.7%) among men reporting only NSPs, and was still 3.4% among men reporting only SPs in the previous six months. Prevalence was 2.8% among men reporting no partners in the previous six months.

Table 5.3.11 Partner types and undiagnosed HIV infection (unweighted)

	Steady partner(s) (n=652)	Non-steady partner(s) (n=1,294)	Steady and non-steady partner(s) (n=1,994)	No partner (n=216)
HIV negative	96.6%	96.3%	96.0%	97.2%
As yet undiagnosed	1.7%	1.2%	1.1%	0.5%
Incident	1.7%	2.5%	2.9%	2.3%

Figure 5.3.12 STI diagnosis and partner numbers (unweighted)



The prevalence of newly acquired as yet undiagnosed HIV infection (incident HIV) was 1.7% among respondents reporting only SPs, 2.5% among respondents reporting only NSPs, and 2.9% among those reporting SPs as well as NSPs in the previous six months. The prevalence of undiagnosed HIV infection in men without a negative pre-test in the previous 12 months (newly diagnosed but not incident HIV) was between 1.1% and 1.7% in all groups except those reporting no partner in the previous six months.

This suggests a less than optimal testing frequency in men with NSPs, and a relatively high risk of HIV transmission in steady partnerships in which condom use is stopped without previously ascertaining HIV status concordance.

STI diagnosis and partner numbers

Reporting an STI diagnosis in the previous 12 months was associated with a higher number of partners in the previous six months. 37.2% of all STIs reported were diagnosed in men reporting more than 10 partners in the previous six months, whilst among men without STIs, only 17.1% reported more than 10 partners in the previous six months.

Summary and conclusions

UAI in the previous six months was reported by approximately half of the study participants, slightly more often from men living in the Central European study cities. UAI was reported more frequently with steady compared to non-steady partners.

The association between age, condom use, and partner type was not consistent across the study cities. In most cities, condom use with a steady partner was lower for younger men than for men 25 years and older, but sample sizes for younger men living in steady relationships were small for several cities. Consequently, firm conclusions about the association between age and condom use with different types of partners are not possible, because associations particularly for the younger age group (<25 years) may be confounded by sampling biases. The most frequent partner type category was the combination of steady and non-steady partners, followed by non-steady partners only and steady partners only.

The effect of knowledge of HIV status on condom use differed by partner type: reported condom use was lowest among HIV negative respondents having AI with a SP and highest among HIV negative respondents having AI with a NSP. Among respondents aware of being infected with HIV, condom use with SPs was higher than among HIV negative men, however, condom use with NSPs was lower. Due to the lower number of men, the differences for respondents aware of being infected with HIV were statistically not significant. Men unaware of being infected with HIV reported the lowest condom use with NSPs. Knowledge of HIV status had a greater impact on unprotected vaginal or AI with female partners. Among men with a negative HIV test result 57.2% of those reporting female sex partners in the previous six months had unprotected intercourse with their female partners, whilst among men aware of being infected with HIV 38.5% had unprotected intercourse. With large confidence intervals due to small numbers, these findings must be interpreted cautiously (see also Section 5.5).

The proportion of participants reporting more than one UAI partner in the previous six months varied between 24.2% and 36.2% in most cities (median 30.9%). Higher proportions were reported from Bratislava, Sofia and Bucharest. High numbers of partners with whom UAI was practiced were reported most frequently by participants infected with HIV, regardless of whether they knew to be HIV infected. However, almost 55% of participants unaware of being infected with HIV reported only one or no UAI partner in the previous six months.

Reporting an STI diagnosis in the previous 12 months was associated with a higher number of sex partners in the previous six months: 37.2% of all STIs reported were diagnosed in men reporting more than 10 partners, while among men without STIs only 17.1% reported more than 10 partners.

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Endnotes

[1] The section on partner numbers in the Sialon II survey had the highest proportion of inconsistent answers. According to the sequence of questions, the number of partners reported in subsequent questions would be expected to stay equal or decline. An answer was therefore regarded as being inconsistent if an increasing number was given. If a number was reported following missing numbers in the respective sequence, this was not regarded as inconsistent. Similarly, due to possible confusion regarding partner categories, replies to non-steady partner questions were set to missing if the number of steady partners ranged from 4 to 6 and equal or less numbers of non -steady partners were given. Implausibly high numbers of reported SP/NSP were also regarded as inconsistent. We defined as 'implausible' a number of more than six SPs and more than 200 NSPs in the previous six months. Implausibly high numbers of SP/NSP in the previous six months were set to missing in the analyses.

[2] HIV status knowledge:

- **HIV negative**: negative saliva test result for anti-HIV antibodies (TLS) or negative serological test result for anti-HIV antibodies (RDS), no previous HIV test or negative previous HIV test reported;
- **HIV newly diagnosed**: positive saliva test result for anti-HIV antibodies (TLS) or positive serological test result for anti-HIV antibodies, no previous HIV test or negative previous HIV test reported (HIV=1, Q32=2/3);
- **HIV indeterminate**: positive HIV saliva test result (TLS), no clear information given on previous testing or test result, (HIV=1, Q32=4 did not get result/9 prefer not to answer/missing/Q31 not answered); reported previous HIV diagnosis (Q32=1/Q29o3=1) and no reactive test result; HIV = missing and Q32=1; HIV=2 or missing and Q29o3=1 and Q31>2011 (but not missing);
- **HIV-positive**: positive saliva test result (TLS) or serological test result (Elisa, Western Blot; RDS), report of a previous HIV diagnosis (HIV=1, Q32=1/Q29o3=1);
- **As yet undiagnosed HIV infection**;
- **HIV negative**: negative saliva test result for anti-HIV antibodies (TLS) or negative serological test result for anti-HIV antibodies (RDS), no previous HIV test or negative previous HIV test reported;
- **HIV incident**: positive saliva test result for anti-HIV antibodies (TLS) or positive serological test result for anti-HIV antibodies, negative HIV test within the previous 12 months reported;
- **HIV as yet undiagnosed**: positive saliva test result for anti-HIV antibodies (TLS) or positive serological test result for anti-HIV antibodies, no previous positive HIV test result and no negative HIV test result within the previous 12 months reported;
- **Known HIV-positive** or **indeterminate HIV status**.

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5.5 Sexual behaviour in the last six months with a female partner

Summary

Most MSM reported only having sex with male partners in the past six months. However, a minority of participants also reported sex with female partners (steady and non-steady) in the past six months. The percentage of behaviourally bi-sexual men varies considerably across cities but seems to be present in all study sites. This subgroup of MSM reported a high number of episodes of unprotected sex with women (almost half) leading to a possible bridging effect for the HIV transmission. The knowledge of HIV status had a greater impact on unprotected vaginal or anal intercourse with female partners.

Introduction

In Europe and elsewhere, it is widely accepted that a percentage of MSM also have sex with female partners irrespective of their sexual identity or orientation (e.g. ECDC, 2013; EMIS, 2010; Montgomery et al., 2003; Sekuler et al., 2014; Godbole et al., 2014). Indeed, findings from the EMIS Network (2010) study showed that whilst most respondents only had had sex with men (82%), 11% of MSM reported sex with both men and women. In Estonia for example, half of respondents to the survey reported that they had previously or were currently also having sex with women. Similarly, among heterosexually active Norwegian MSM, more than 80% stated that they had had unprotected vaginal or anal sex with a woman in the past year. Given that men who have sex with men *and* women have been reported to be less likely to disclose their behavioural bisexuality to partners of both sexes (e.g. Montgomery et al., 2003; see also Godbole et al., 2014), understanding such interactions is important in order to be able to develop specific interventions for this particularly hard to reach and often isolated (from other MSM) sub-population of MSM.

In this Section, data are presented on the percentages of participants who reported having had sexual intercourse with a female partner (steady and non-steady) in the last six months stratified by city. Sex with a female partner is then explored by 'outness' and sexual satisfaction. Finally, for those who reported having had sexual intercourse with a female partner, average numbers of female partners are presented along with the percentages of participants whose intercourse with a female partner was unprotected.

Variables

To explore sexual behaviour with a female partner in the last six months, for TLS cities, participants were asked two questions: 1) "In the last 6 months, how many female partners (steady and non-steady) have you had sex with?", and; 2) "In the last 6 months, did you have any unprotected (without condom) anal or vaginal intercourse with a woman?" Participants could respond by stating the number of female partners (or zero if applicable), or state 'I prefer not to answer'. For RDS cities separate questions were asked for steady and non-steady female partners using the same item and response structure as above.

Results

Sex with female partners

The percentage of MSM reporting sexual intercourse with a female partner (steady and non-steady) in the last six months varied considerably between the study sites (Figure 5.5.1). The highest percentage was reported by MSM in Bucharest (43.2) and the lowest in Brussels (2.3).

Figure 5.5.1 Percentage of MSM having had sexual intercourse with a female partner (steady and non-steady) in the last six months

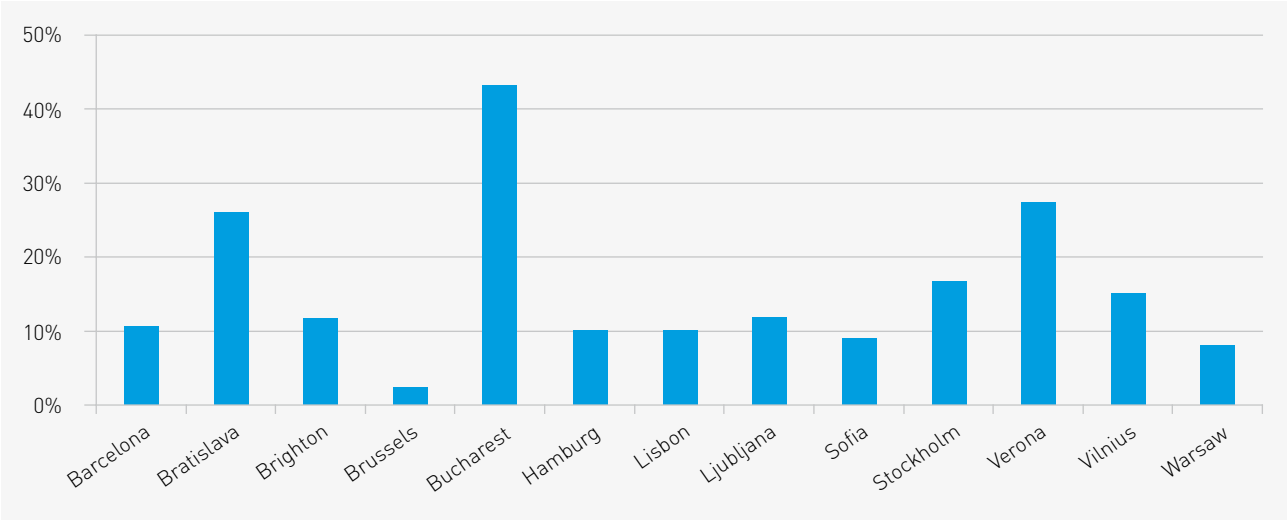


Table 5.5.1 Percentage of MSM having had sexual intercourse with a female partner (steady and non-steady) in the last six months

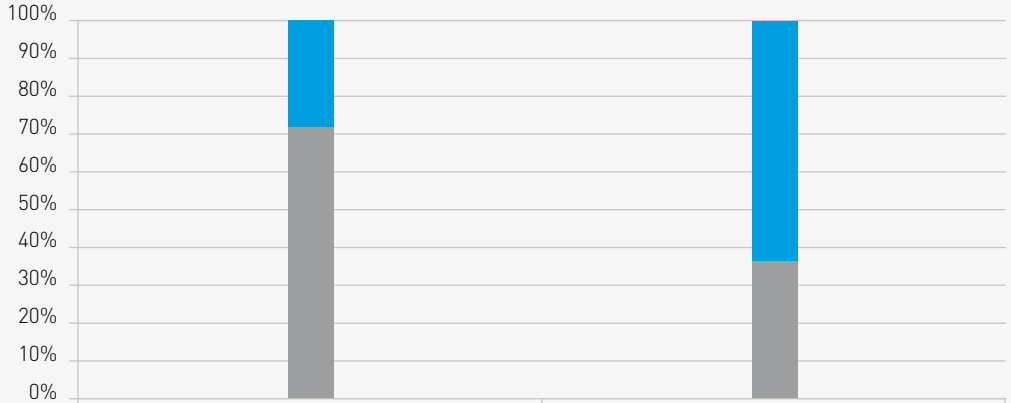
City	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Denominator
BARCELONA	**10.6**	5.2	16.0	1.7	391
BRATISLAVA	**26.1**	21.0	31.2	1.9	393
BRIGHTON	**11.6**	6.4	16.8	1.5	411
BRUSSELS	**2.3**	0.2	4.5	1.4	407
BUCHAREST	**43.2**	31.6	54.8	2.6	177
HAMBURG	**10.1**	5.8	14.4	1.4	402
LISBON	**10.1**	3.5	16.8	2.2	406
LJUBLJANA	**11.8**	7.7	15.9	1.3	408
SOFIA	**9.0**	1.4	16.7	2.4	366
STOCKHOLM	**16.8**	12.2	21.4	1.2	394
VERONA	**27.4**	19.3	35.5	3.7	360
VILNIUS	**15.1**	10.1	20.1	1.9	321
WARSAW	**8.0**	4.3	11.7	1.3	411

As can be seen with reference to Table 5.5.1, because the number of participants declaring sex with female partners is relatively low compared to other study variables, age categorisation is not used as a stratification variable in the present section. In addition to Bucharest, high percentages were reported in Bratislava (26.1%) and Verona (27.4%). On the contrary, low percentages were reported in Sofia (9.0%) Warsaw (8.0%) and – as mentioned – Brussels (2.3%). A significant variability was present in the design effects of each city, with design effect ranging from 1.2 to 3.7.

Sex with female partners by 'outness'

In Sialon II, 'outness' was defined as the degree to which people are open about their sexual attraction with others and asked: "Thinking about all the people who know you (including family, friends and work or study colleagues), what percentage know that you are attracted to men?" Five answers were possible including: 'All or almost all'; 'more than half'; 'less than half'; 'few' and 'none'. Reporting sex with female partners in the previous six months (steady and non-steady) was associated with a lower level of 'outness' regarding sexual attraction to men towards family, friends and co-workers compared with sex with only male partners. As can be seen from Figure 5.5.2, 70% of participants who reported having sex with both male and female partners in the last six months were 'out' to less than half of all the people who knew them; compared to just over 30% for participants with male partners only.

Figure 5.5.2 Sex with women by 'outness'

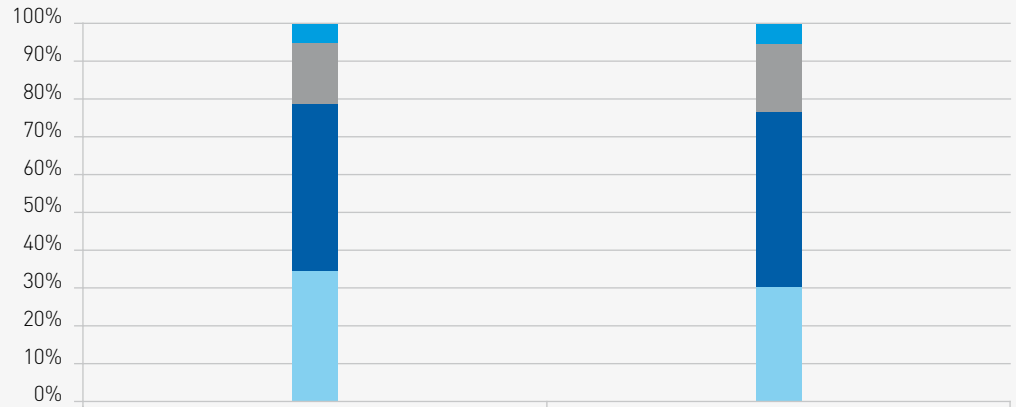


	Female and male partners (n=587)	Exclusively male partner(s) (n=3,809)
Out to majority	27,9%	62,6%
Out to less than half	72,1%	37,4%

Sex with female partners by sexual satisfaction

With reference to Figure 5.5.3, participants in both TLS and RDS cities were asked about their level of satisfaction with their sex lives (see also Section 5.11) in response to being asked: "How satisfied are you with your sex life?" (options provided were: 'very satisfied'; 'somewhat satisfied'; 'somewhat unsatisfied'; 'very unsatisfied', and; 'I prefer not to answer'). When stratifying sex with female partners by sexual satisfaction, there were no significant differences in reported sexual satisfaction between respondents reporting male sex partners only versus those men reporting male and female sex partners in the previous six months (Figure 5.5.3).

Figure 5.5.3 Sex with male and female partners and sexual satisfaction



	Female and male partners	Male partner only
Unsatisfied	4,8%	5,2%
Somewhat unsatisfied	16,4%	18,1%
Somewhat satisfied	44,2%	46,6%
Very satisfied	34,6%	30,2%

Average number of female partners

In terms of the average number of female partners (steady and non-steady) in the last six months as declared by MSM respondents, the highest averages were in Bratislava (11.4), Bucharest (7.3) and Hamburg and Verona (both 6.9). The lowest average number of female partners was declared by participants from Brussels (1.8). However, with the exception of Bratislava, Bucharest, and Verona, median values suggest a more similar distribution between the cities with values of <3.5 for the majority of the cities (Table 5.5.2). Nevertheless, in some cases confidence intervals are relatively wide and with small sample sizes for some cities, variable estimates must be interpreted cautiously.

Unprotected sex with female partners

Of those participants who reported having had sexual intercourse with a female partner (steady and non-steady) in the last six months, there was some variation in those who also reported that this sex had been unprotected (Table 5.5.3). The highest percentages of unprotected anal or vaginal intercourse were reported by participants from Brighton (76.9%), Verona (73.1%), and Vilnius (63.0%), and the lowest in Ljubljana (25.1%). However, once again the estimates must be interpreted cautiously given that sample sizes are small and in many cases, confidence intervals wide.

Unprotected sex with female partners by HIV status

Given the above, of particular interest is to explore the percentage of participants reporting unprotected intercourse (anal or vaginal) with a steady and/or non-steady female partner in the last six months who are also HIV-positive as indicated by laboratory analysis (OF for TLS cities and serum for RDS cities). However, as the sample size calculation and the study design were done in order to estimate the HIV prevalence, considering the low subsample size due when stratifying by HIV serostatus among those declaring sex with women, analysis revealed that the point estimates were not meaningful and thus are not presented here.

Table 5.5.2 Average number of female partners (steady and non-steady) in the last six months

City	Mean	Median	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Denominator
BARCELONA	**4.7**	1	0.7	8.7	1.8	31
BRATISLAVA	**11.4**	10	6.7	16.2	1.5	35
BRIGHTON	**2.7**	2	1.8	3.6	1.0	55
BRUSSELS	**1.8**	1	1.0	2.5	1.2	18
BUCHAREST	**7.3**	5	4.9	9.7	1.2	51
HAMBURG	**6.9**	2	0.0	16.7	1.5	46
LISBON	**2.0**	2	1.2	2.8	1.1	54
LJUBLJANA	**5.7**	1	4.0	7.4	1.3	41
SOFIA	**3.7**	1	1.2	6.2	2.0	32
STOCKHOLM	**2.1**	2	1.3	2.9	1.6	58
VERONA	**6.9**	4	4.4	9.4	1.2	42
VILNIUS	**5.9**	3.5	2.5	9.4	1.3	20
WARSAW	**2.6**	1	1.6	3.6	1.3	28

Table 5.5.3 Percentage of MSM having had an unprotected intercourse with a female partner (steady and non -steady) in the last six months

City	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Denominator
BARCELONA	**37.7**	2.4	73.0	2.0	35
BRATISLAVA	**51.2**	37.8	64.6	1.3	67
BRIGHTON	**76.9**	61.5	92.3	1.2	56
BRUSSELS	**36.6**	9.9	63.4	1.1	21
BUCHAREST	**55.8**	40.6	71.0	1.7	70
HAMBURG	**52.7**	25.9	79.5	1.2	48
LISBON	**35.7**	18.9	52.5	1.3	62
LJUBLJANA	**25.1**	4.7	45.6	1.4	40
SOFIA	**57.3**	9.2	105.5	2.7	38
STOCKHOLM	**49.4**	33.5	65.3	1.2	66
VERONA	**73.1**	56.5	89.7	2.5	67
VILNIUS	**63.0**	60.0	66.1	0.0	36
WARSAW	**41.1**	20.8	61.4	1.0	29

Summary and conclusions

- Most MSM who participated in this study reported having sex with only male partners in the past six months. However, a minority of participants also reported sex with female partners (steady and non-steady) in the past six months. It is possible that these behaviourally bisexual MSM who also have sex with women may constitute a subgroup that differs from the study's larger group of participants who report male-only partners; for example, in terms of percentages by country, age distribution, 'outness', sexual behaviours, and other variables. However, as an in-depth analysis of this subgroup and these differences was not a main focus of the Sialon II survey, only a very basic analysis was conducted to estimate sex with women stratified by few variables.
- Relatively high percentages of participants reporting sex with women reported that this sex was unprotected; biological data (not reported here) suggest a possible risk of HIV transmission to female partners (e.g. due to undiagnosed HIV infection).
- Overall, the findings suggest that there are important HIV prevention opportunities for tailored programmes in order to capture MSM who have sex with both men and women, particularly in those cases where MSM do not disclose their behavioural bisexuality to both their male or female partner.

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5.6 Sexual behaviour during last episode

Summary

The last episode of anal sex is an important indicator suggested to estimate the sexual behaviour and its associated risk. This was reported almost equally as often with a steady and a non-steady partner. Sexual roles during this last anal intercourse were found to be distributed equally between insertive, receptive, and both, with only minor variations between cities. The HIV serostatus concordance with the last steady anal sex partner was almost always assumed and also the HIV seroconcordance with non-steady anal sex partners was rarely established. Not knowing one's own HIV status or the steady partner's HIV status was most frequent in Central European cities. Condomless AI was considerably more frequent when the last anal sex partner was a steady partner compared to a non-steady partner.

Introduction

In order to understand more about condom use and HIV serostatus communication (two of the most frequently employed risk management tactics/strategies), participants in the survey were asked to report details regarding their last episode of anal sex.

Assuming that, on a population level, sexual behaviours and practices with the last anal sex partner represent behaviour patterns, an analysis of serostatus communication and sexual risks with the last anal sex partner in the context of HIV test results (from biological samples) may provide information on current risk management tactics/strategies and may provide evidence for improving and better targeting prevention messages.

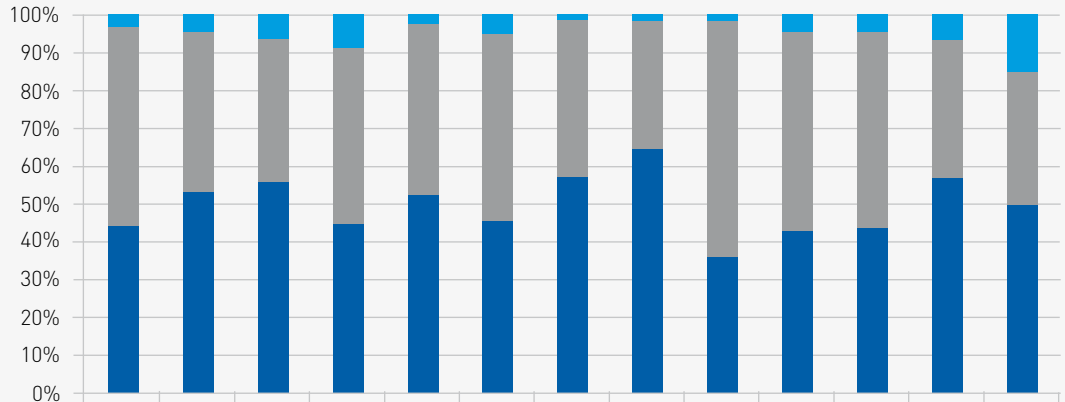
This section therefore presents findings from a series of questions around the last time participants had anal sex including the partner type, which role was assumed (insertive, receptive, versatile), condom use, and communication regarding HIV serostatus.

Results

Last anal intercourse by partner type and city

Participants were asked: "The last time you had anal intercourse with a male partner, who did you have it with?" Possible responses were: 'one steady partner', 'one non-steady partner', 'more partners at once', 'I never had anal intercourse', and' I prefer not to answer' [1]. Approximately half of the last anal intercourse (AI) episodes were reported to be with a steady partner (SP) ranging from 37.4% in Sofia to 65.4% in Ljubljana. Half were reported to be with a non-steady partner (NSP) ranging from 33.0% in Ljubljana to 61.0% in Sofia. A low proportion of participants ranging from 1.4% in Lisbon to 14.7% in Warsaw were with more than one partner (Figure.5.6.1).

Figure 5.6.1 Last anal intercourse by partner type and city (weighted)

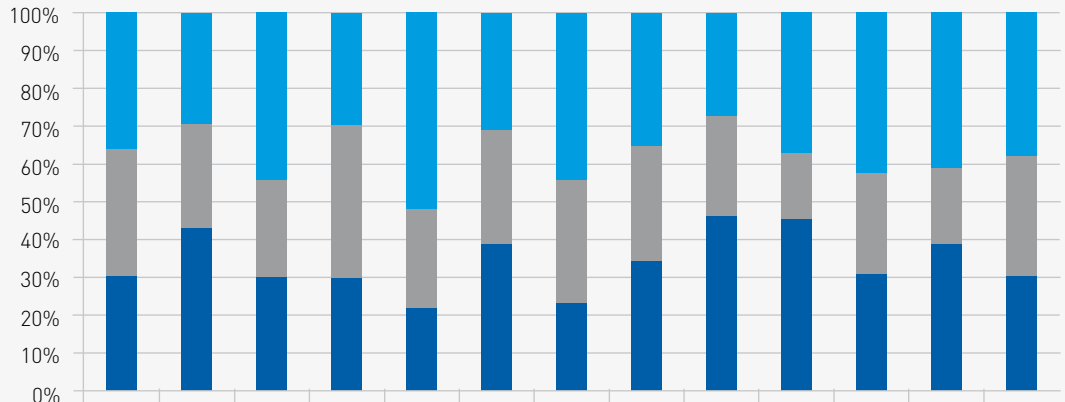


	Barcelona	Bratislava	Brighton	Brussels	Bucharest	Hamburg	Lisbon	Ljubljana	Sofia	Stockholm	Verona	Vilnius	Warsaw
More than one partner	3,3	4,5	6,1	8,6	2,5	5,2	1,4	1,6	1,6	4,4	4,5	6,4	14,7
Non-steady partner	50,9	41,1	36,7	44,9	43,6	47,9	40,3	33,0	61,0	51,0	50,3	35,6	34,0
Steady partner	45,8	54,4	57,2	46,4	53,9	46,9	58,3	65,4	37,4	44,6	45,3	58,1	51,3

Sexual roles (insertive, receptive, versatile) by city [3]

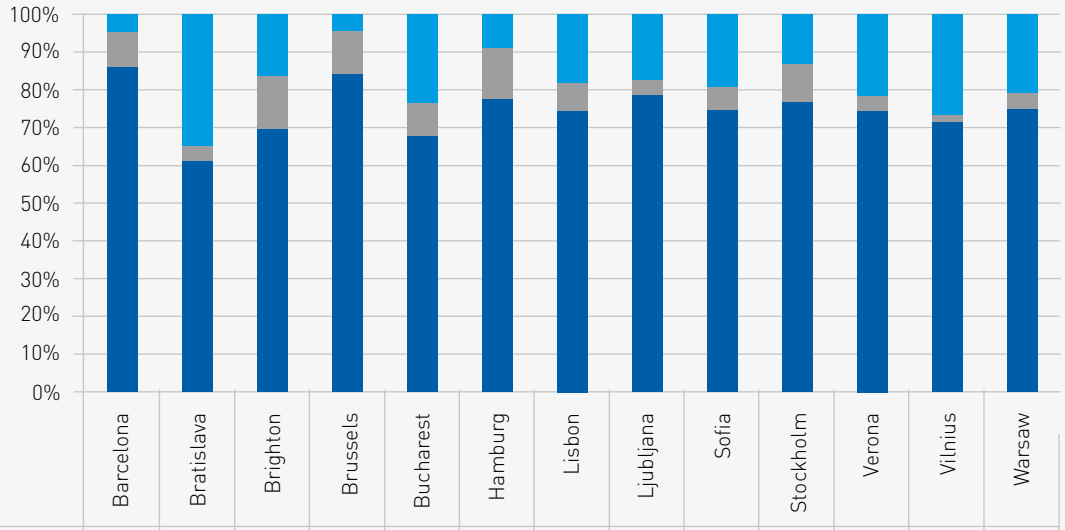
Participants were asked whether they assumed the insertive or receptive role or both, and whether condoms were used by themselves or their partners. The item stated: "Last time you had anal intercourse, were you..." and respondents could answer 'yes' or 'no' (or 'I prefer not to answer') to four items: 'penetrated (fucked) with a condom?', 'penetrating (fucking) with a condom?', 'penetrated (fucked) without a condom?', 'penetrating (fucking) without a condom?'

Figure 5.6.2 Sexual role during last anal intercourse by city (weighted)



	Barcelona	Bratislava	Brighton	Brussels	Bucharest	Hamburg	Lisbon	Ljubljana	Sofia	Stockholm	Verona	Vilnius	Warsaw
Insertive	35,6	29,0	43,7	29,2	51,4	30,6	43,7	34,8	26,9	36,8	41,9	40,7	37,4
Versatile	33,1	27,5	25,5	40,2	25,7	30,0	32,3	30,2	26,2	17,1	26,3	19,7	31,3
Receptive	31,3	43,6	30,7	30,6	22,9	39,4	24,0	35,1	46,9	46,1	31,8	39,6	31,3

Figure 5.6.3 Concordance with steady partner during last anal intercourse by city



	Barcelona	Bratislava	Brighton	Brussels	Bucharest	Hamburg	Lisbon	Ljubljana	Sofia	Stockholm	Verona	Vilnius	Warsaw
Non-concordant	4,7	35,0	16,2	4,5	23,7	8,8	18,1	17,3	19,3	13,3	21,5	26,7	20,9
Discordant	9,3	4,0	14,1	11,3	8,4	13,7	7,7	4,0	5,9	9,8	4,1	1,8	4,1
Concordant	86,0	61,0	69,7	84,2	67,9	77,5	74,3	78,8	74,8	76,9	74,4	71,4	75,0

Sexual roles were almost equally distributed between insertive, receptive or versatile. The proportion of men engaging only in receptive AI was particularly high in Sofia (46.9%) and Stockholm (46.1%). The proportion of men engaging only in insertive AI was particularly high in Bucharest (51.4%), followed by Brighton and Lisbon (both 43.7%); while Brussels had the highest proportion of versatile respondents (40.2%; Figure 5.6.2).

Knowledge of HIV serostatus concordance with last steady anal sex partner by city [2] [3]

If the last AI was with a SP, reported knowledge of partners' HIV serostatus was generally very high. In Barcelona and Brighton 95.5% of the respondents with a SP reported knowing their partners' HIV serostatus. The lowest knowledge was reported from respondents from Central European cities (Bratislava 35.0% not knowing, Bucharest 31.0%, Vilnius 26.7%, Bucharest 23.7%, Warsaw 20.9%, and Sofia 19.3%). This suggests lower overall testing rates.

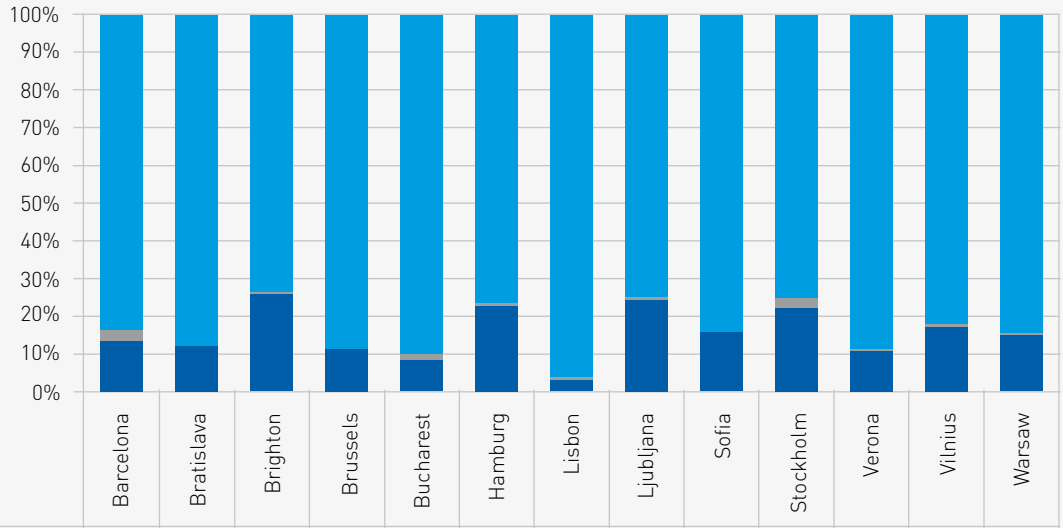
Reported HIV discordance with the steady partner was higher in the Western European cities (7.7% to 14.1%, minimum value in Verona with 4.1%) than in the Central European cities (1.8% to 5.9%, maximum value in Bucharest with 8.4%), (see Figure 5.6.3).

HIV serostatus concordance with last non-steady anal sex partner by study site [2] [3]

In contrast, the HIV serostatus of the last non-steady anal sex partner was usually unknown (range 72.2% in Brighton to 94.5% in Lisbon). Known HIV serodiscordance with a NSP was very rarely reported (see Figure 5.6.4). This suggests that HIV serostatus communication with non-steady partners is infrequent.

Of note is that the large difference in serostatus knowledge and concordance between SP and NSPs is due partly to a less restrictive definition of concordance with the SP (also including 'assumed' seroconcordance). The rationale for using this less restrictive definition is that serostatus communication was queried only for the last AI. However, in most cases the relationship with the SP will have existed for a longer time period than the survey encompasses. Thus, serostatus knowledge may exist although it was not specifically communicated during the last AI event.

Figure 5.6.4 Concordance with last non-steady partner during last anal intercourse by city (weighted)



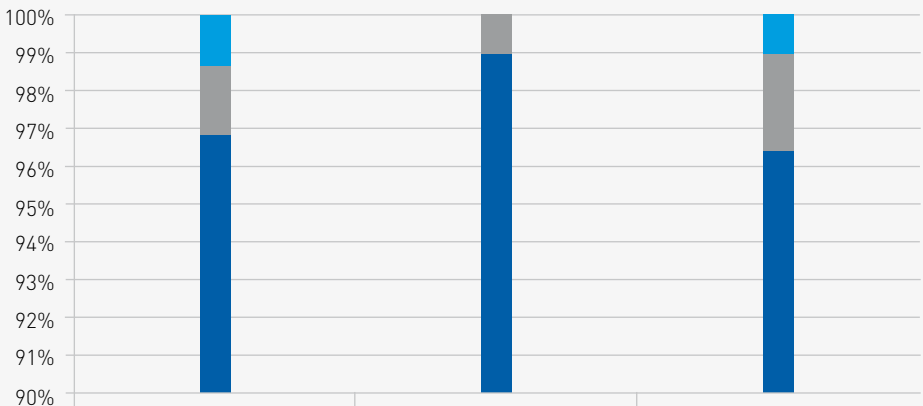
	Barcelona	Bratislava	Brighton	Brussels	Bucharest	Hamburg	Lisbon	Ljubljana	Sofia	Stockholm	Verona	Vilnius	Warsaw
Non-concordant	82,1	86,3	72,2	87,1	88,3	74,9	94,5	73,5	82,6	73,9	87,0	80,4	83,0
Discordant	3,0	0,0	0,5	0,0	1,8	0,9	0,4	0,5	0,0	2,3	0,5	0,6	0,1
Concordant	14,9	13,7	27,3	12,9	9,9	24,2	5,1	26,0	17,4	23,8	12,5	18,9	16,9

HIV seroconcordance with last anal sex partner and as yet undiagnosed HIV [3]

Looking at reported HIV concordance with the last anal sex partner and the prevalence of undiagnosed HIV infection, assumed serostatus concordance and non-concordance were associated with a prevalence of 3.1% and 3.6% undiagnosed HIV infections. Known discordance of partners' HIV status was associated with a prevalence of 1.1% undiagnosed infections (see Figure 5.6.5).

The lower prevalence of undiagnosed HIV in men reporting a discordant last anal intercourse partner may be explained by higher frequency of condom use with known HIV status discordance, low infectiousness of HIV-positive men disclosing their HIV status due to effective antiretroviral treatment, and by more frequent HIV

Figure 5.6.5 Assumed concordance during last anal intercourse and undiagnosed HIV infection (unweighted)



	concordant (n=1,415)	discordant (n=95)	non-concordant (n=1,638)
As yet undiagnosed (but not incident)	1,3%	0,0%	1,0%
Incident	1,8%	1,1%	2,6%
HIV negative	96,8%	98,9%	96,4%

testing of HIV negative men aware of having had anal sex with a discordant partner. It should be noted anyway that the numbers in the "discordant" group are small, therefore data should be interpreted with caution.

Prevalence of recently acquired and as yet undiagnosed HIV infection (incident HIV) was highest (2.6%) among respondents reporting no knowledge or no discussion about HIV serostatus (non-concordance). This was not statistically different from the 1.8% prevalence when the partners' HIV serostatus was assumed to be concordant with the serostatus of the respondent.

Undiagnosed HIV infections of unknown duration (as yet undiagnosed but not incident HIV) were most prevalent among men reporting serostatus concordance with their last anal sex partner, slightly less prevalent among men reporting no knowledge or discussion about HIV serostatus with their last anal sex partner, and absent among men reporting assumed HIV-serostatus discordance with their last anal sex partner.

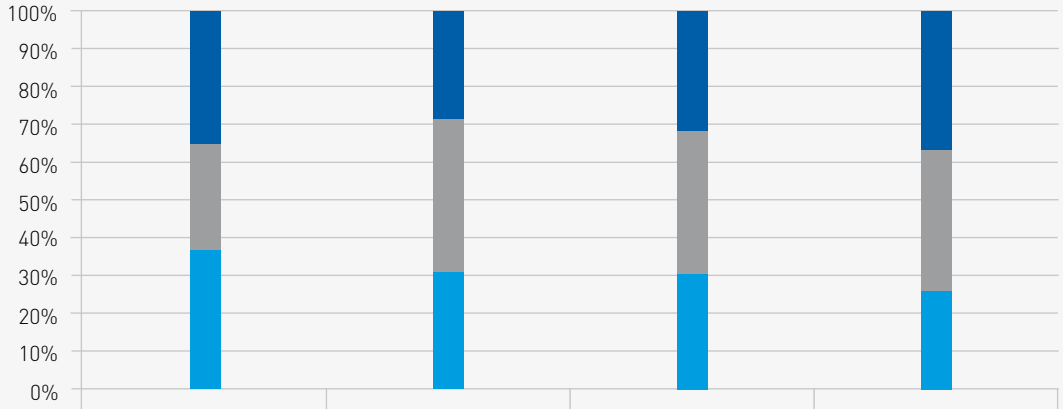
Sexual roles (insertive, receptive, versatile) by knowledge of HIV status [3]

Reported sexual roles during the last AI varied due to HIV serostatus knowledge (see previous sub-section on sexual roles for the item wording and response options). Whilst the proportion of respondents reporting to have been 'insertive' was largest among men assuming to be HIV negative, men who were aware of being infected with HIV most often reported having been receptive or versatile during the last AI (Figure 5.6.6). This difference may be at least partly due to intentional decisions associated with different perceived HIV transmission probabilities during insertive and receptive AI and has been described as 'strategic positioning'.

Condom use during last anal sex partner by city (GARPR 1.12) [3]

Condom use during last AI (consistent, inconsistent, none) with a male sex partner is one of the indicators collected for the Global AIDS response progress monitoring (GARPR 1.12). Condom use in the Sialon II cities ranged between 68.7% in Barcelona and 45.2% in Bratislava. In most cities higher proportions of condom use were reported from younger participants (<25 years). Exceptions were Bratislava, Bucharest, Lisbon, Verona, and Warsaw. Variability was also larger in younger participants; condom use was reported by 84.6% of young MSM in Barcelona and 34.6% in Bucharest. In the older age group (≥25 years) proportions varied between 72.0%

Figure 5.6.6 Sexual role by HIV status (unweighted)



	Known or assumed HIV negative (n=3,472)	As yet undiagnosed HIV positive (n=144)	Indeterminate knowledge HIV positive (n=98)	Known HIV positive (n=219)
Insertive	36,7%	31,3%	30,6%	26,0%
Versatile	28,1%	40,3%	37,8%	37,4%
Receptive	35,1%	28,5%	31,6%	36,5%

Table 5.6.1 Condom use during last anal intercourse with a male partner (GARPR 1.12)

City	Age	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Sample Size
BARCELONA	< 25	84.6	70.5	92.7	1.05	36
	⩾ 25	65.7	56.5	73.9	2.26	267
	total	68.7	59.1	77.0	2.95	303
BRATISLAVA	< 25	41.7	27.2	53.1	1.96	88
	⩾ 25	46.7	38.5	54.8	1.74	202
	total	45.2	38.1	51.4	1.67	290
BRIGHTON	< 25	56.8	34.9	76.3	1.88	46
	⩾ 25	51.7	40.9	62.4	2.81	222
	total	52.4	41.3	63.4	3.48	268
BRUSSELS	< 25	83.7	67.3	92.8	0.95	39
	⩾ 25	57.6	44.5	69.8	4.51	253
	total	60.7	47.7	72.3	4.97	292
BUCHAREST	< 25	34.6	11.8	56.9	1.84	31
	⩾ 25	62.3	47.8	76.8	2.00	85
	total	56.6	43.7	69.5	2.06	116
HAMBURG	< 25	74.9	44.0	91.9	2.90	29
	⩾ 25	49.1	38.8	59.6	2.80	252
	total	52.5	42.6	62.1	2.84	281
LISBON	< 25	53.1	28.5	76.3	2.65	30
	⩾ 25	72.0	65.2	77.9	1.45	294
	total	69.6	64.5	74.3	0.95	324
LJUBLJANA	< 25	57.6	35.8	76.8	3.35	91
	⩾ 25	47.1	37.7	56.6	2.13	204
	total	49.5	42.6	56.5	1.50	295
SOFIA	< 25	80.0	71.7	86.2	0.85	114
	⩾ 25	59.3	54.5	64.0	0.72	278
	total	64.7	60.6	68.5	0.70	392
STOCKHOLM	< 25	62.6	44.2	78.0	1.71	38
	⩾ 25	56.9	43.9	69.0	2.47	160
	total	58.4	47.0	69.0	2.61	198
VERONA	< 25	55.7	39.5	71.1	2.62	87
	⩾ 25	63.9	55.2	73.9	2.70	235
	total	61.6	53.9	70.1	2.70	324
VILNIUS	< 25	59.6	45.2	74.3	1.77	67
	⩾ 25	55.3	46.0	65.5	2.02	177
	total	56.6	48.9	65.0	1.91	244
WARSAW	< 25	51.4	37.3	65.3	1.70	67
	⩾ 25	57.0	47.9	65.7	1.70	215
	total	55.4	48.2	62.4	1.50	282

in Lisbon and 46.7% in Bratislava (Table.5.6.1). However, the small sample sizes for the younger age group in many of the study cities should be considered when interpreting these findings.

Differences between cities can be explained partly by different proportions of men having their last AI with a SP. As shown in Figures 5.6.7 and 5.6.8, condom use was much lower when the last anal sex partner was a SP compared to a NSP. Condom use during the last anal sex when the partner was the SP and the respondent was younger than 25 years, was high in Brussels (60.0%), Sofia (63.0%) and Barcelona (69.0%), and low in Hamburg (26.0%) and Ljubljana (25.0%). Among older respondents (≥25 years) with SPs, condom use increased among men from Warsaw, Lisbon, Ljubljana, and Stockholm. Condom use declined in older men from Brussels, Sofia, Hamburg, Barcelona, and Brighton.

When the last anal sex partner was a NSP, condom use during the last anal sex episode was generally high. Condom use with NSPs was usually higher among younger participants (< 25 years) compared to older participants (≥25 years).

Figure 5.6.7 No condom use during last anal intercourse with steady partner by age group and city (weighted)

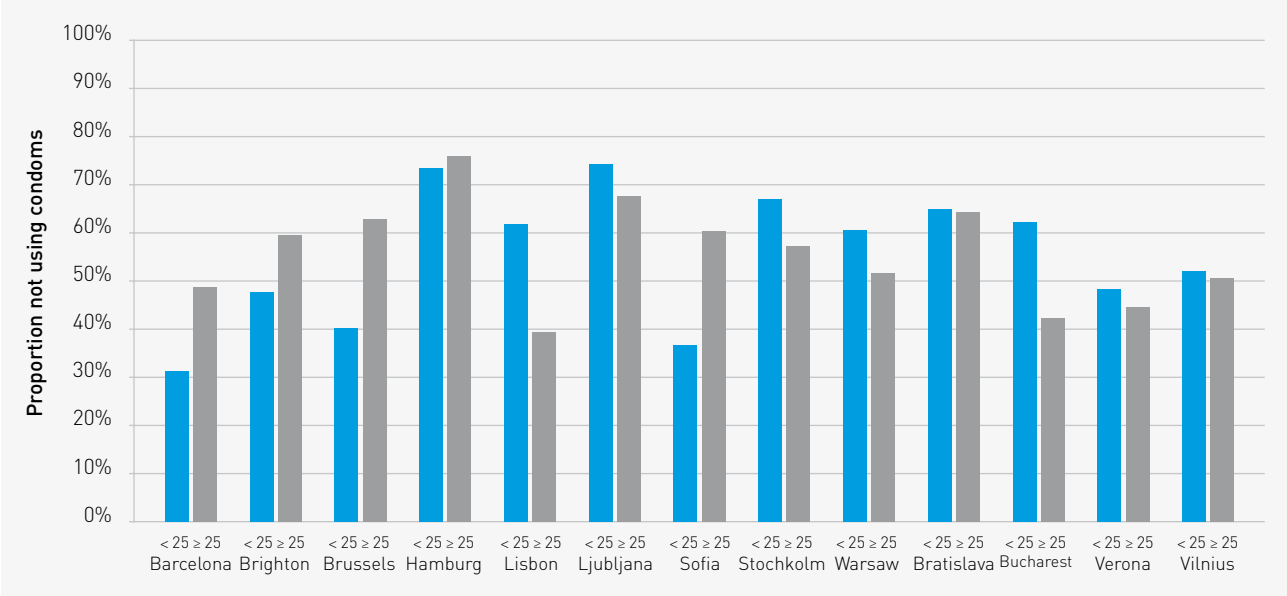
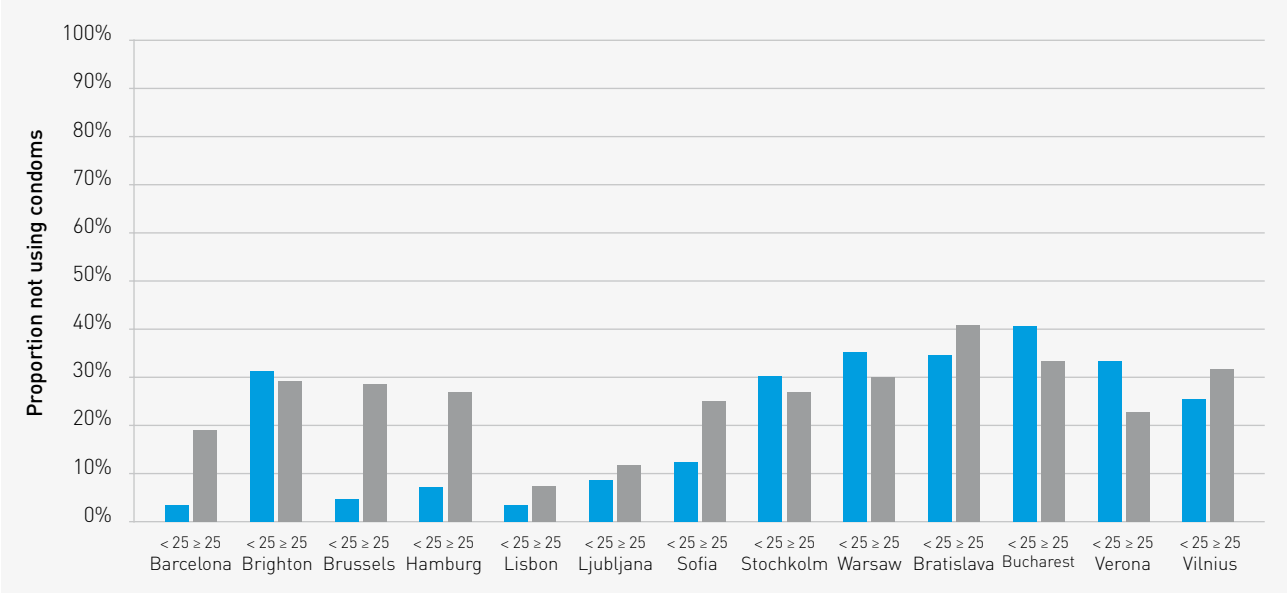


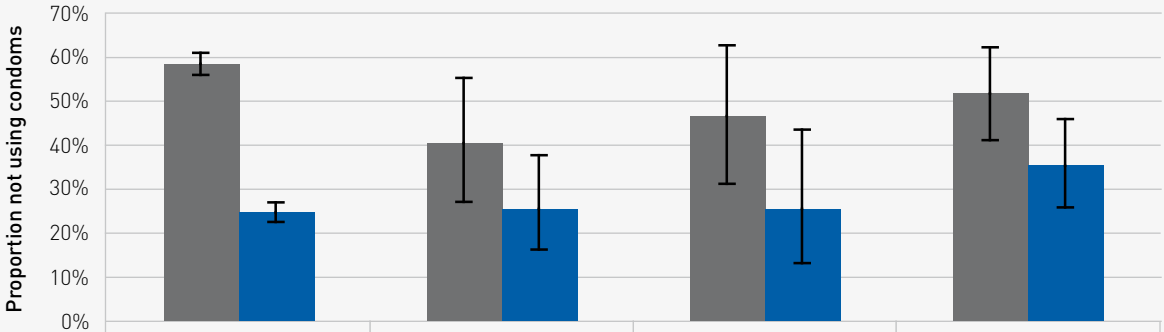
Figure 5.6.8 No condom use during last anal intercourse with non-steady partner by age group and city (weighted)



Condom use with last non-steady anal sex partner by knowledge of HIV status (unweighted) [3]

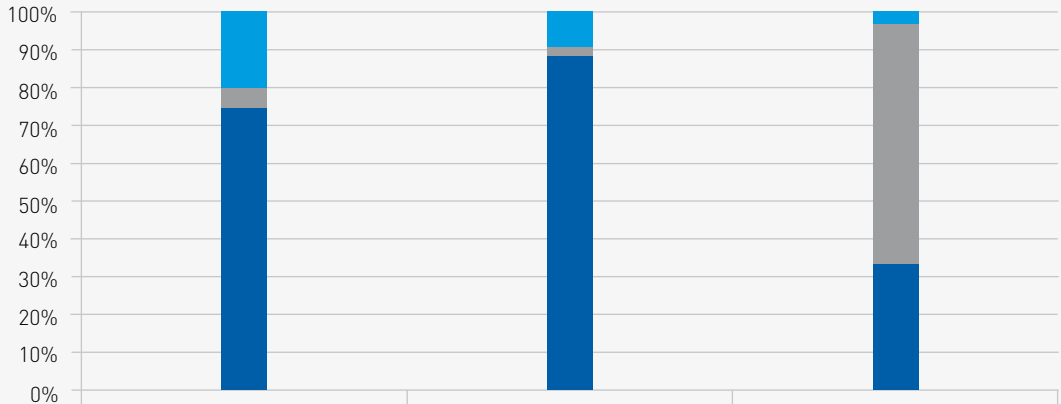
If the last anal sex partner was a SP, the percentage of UAI was slightly lower when the respondent was aware of being infected with HIV compared to men assuming to be HIV negative. Compared with HIV negative respondents, reported proportion of UAI with the last non-steady anal sex partner was higher among respondents aware of being HIV-positive (see Figure 5.6.9). This is likely partly due to reported or assumed HIV-positive seroconcordance with the partner, partly due to a perception of reduced infectiousness under effective antiretroviral treatment, and partly due to a reduced sense of personal responsibility in specific settings such as sex clubs (O'Leary et al., 2013).

Figure 5.6.9 No condom use with steady and non-steady partner during last anal intercourse by HIV status knowledge (n_{SP}=1,617; n_{NSP}=1,596)



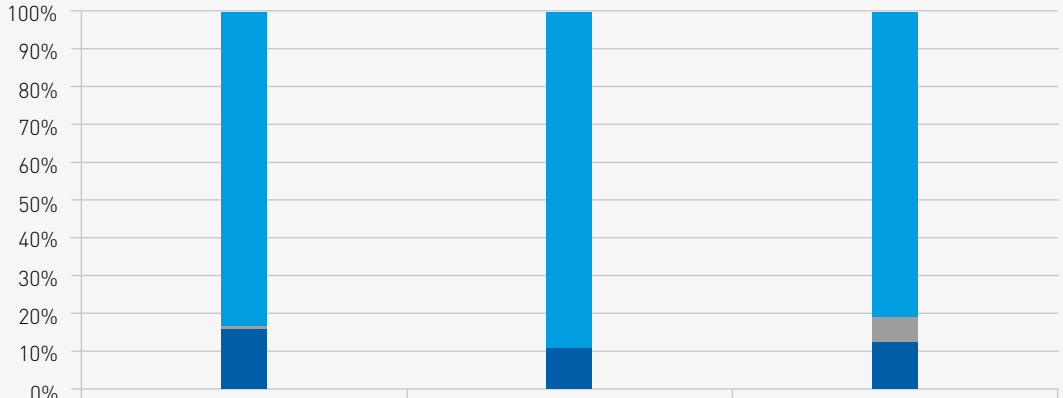
	Known or assumed HIV negative (n=2,874)	As yet undiagnosed HIV positive (n=106)	Indeterminate HIV positive (n=67)	Known HIV positive (n=166)
UAI with SP	59,2%	40,9%	47,2%	52,4%
UAI with NSP	24,9%	25,8%	25,8%	35,7%

Figure 5.6.10 Concordance with last steady partner (unweighted) (n=1,641)



	Known or assumed HIV negative (n=1,511)	As yet undiagnosed HIV positive (n=43)	Indeterminate knownledge HIV positive (n=87)
Non-concordant	20,3%	9,3%	3,4%
Discordant	5,3%	2,3%	63,2%
Concordant	74,5%	88,4%	33,3%

Figure 5.6.11 Concordance with last non-steady partner (n=1,690)



	Known or assumed HIV negative (n=1,532)	As yet undiagnosed HIV positive (n=62)	Known HIV positive (n=88)
Non-concordant	83,1%	88,7%	80,7%
Discordant	0,9%	0,0%	6,8%
Concordant	16,0%	11,3%	12,5%

HIV serostatus knowledge of last steady anal sex partner by HIV status (unweighted) [3]

Knowledge (or assumed knowledge) of the HIV serostatus of the last steady anal sex partner was high. Awareness of last steady anal sex partners' HIV status was highest among men diagnosed with HIV. Assumed negative concordance with the last steady anal sex partner was highest among men unaware of being infected with HIV, pointing to the high risk associated with incorrect assumptions about the steady partners' HIV serostatus (Figure 5.6.10).

Communication of HIV serostatus with last non-steady anal sex partner by HIV status (unweighted) [2] [3]

When the last anal sex partner was a NSP, usually the respondents had no reliable information on the HIV serostatus of their partners. The men unaware of being infected with HIV was the group with the lowest level of serostatus communication with the last non-steady anal sex partner (Figure 5.6.11). This suggests that transmission risks with NSPs are mostly associated with lack of condom use combined with absence of serostatus disclosure or knowledge.

Summary and conclusions

- The last episode of anal sex was reported almost equally as often with a steady and a non-steady partner. Sexual roles during this last AI were distributed equally between insertive, receptive, and versatile, with only minor variations between cities.
- Assumed HIV serostatus concordance was very high with the last steady anal sex partner.
- Not knowing the own or the steady partner's HIV status was most frequent in Central European cities.
- HIV seroconcordance with non-steady anal sex partners was rarely established.
- UAI was considerably more frequent when the last anal sex partner was a SP compared to a NSP.
- The proportion of UAI was relevant among known HIV-positive participants with both steady and non-steady partners.

- The proportion of as yet undiagnosed HIV infections was approximately 3-3.5%, independent of assumed HIV seroconcordance with the last anal sex partner.
- If the last anal sex partner was a SP, those with as yet undiagnosed HIV infection reported the highest level of (wrongly) assumed HIV seroconcordance with their partner.
- If the last anal sex partner was a NSP, those with as yet undiagnosed HIV infection reported the lowest level of HIV status knowledge of their sex partner.

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Endnotes

[1] For participants who answered 'I never had anal sex', all subsequent answers to questions Q27-Q29 were set to missing. Since one possible answer to Q26 was 'multiple partners', participants were instructed to tick all options which applied in Q27-Q29. However, many participants who indicated only one steady or non-steady partner in Q26 indicated more than one response options in Q28 and Q29. Closer analysis revealed that almost all of these multiple responses could not be regarded as inconsistent. E.g., several participants indicated: 'I thought my partner was HIV negative', 'I knew my partner was HIV negative', 'I was not interested in his HIV status'. Thus, only the answers of six participants, who had checked all available response options, were set to missing.

[2] To examine participants' knowledge of their partners' HIV serostatus at last AI, respondents were asked: "Last time you had anal intercourse, what did you think about your partner/s HIV status before having sex?" Possible responses included: 'I thought he was HIV negative', 'I knew he was HIV negative', 'I thought he was HIV-positive', 'I knew he was HIV-positive', 'I knew he was unsure about his HIV status', 'I didn't have any thoughts about his HIV status', 'I do not remember', and 'I prefer not to answer'. Similarly, participants were also asked about what they had disclosed about their HIV status to their partner at last AI: "Last time you had anal intercourse, what did you tell your partners/s about your HIV status before having sex?" Possible responses included: 'I told him I didn't know my HIV status'; 'I told him I was HIV negative', 'I told him I was HIV-positive', 'I said nothing about my HIV status', 'I told him I was unsure about my HIV status', 'I do not remember', and 'I prefer not to answer'.

[3] Secondary variables computed included:

- Sexual role during last anal intercourse (insertive [top]; receptive [bottom]; versatile);
- Condom use during last anal intercourse (consistent; inconsistent/ none);
- Serostatus concordance with steady partner (concordance defined as respondent reporting the same HIV serostatus as the reported *or* assumed serostatus of the steady partner);
- Serostatus concordance with non-steady partner (concordance defined as respondent reporting the same HIV serostatus as the reported – *but not the assumed* – serostatus of the non-steady partner);
- Not knowing the own HIV serostatus or the serostatus of the last anal sex partner or not communicating about HIV status was defined as non-concordant.

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5.7 Commercial sex

Summary

The majority of study participants in the RDS samples reported low levels of involvement in commercial sex with the exception of Bucharest. Among those who had been paid for sex, a high percentage reported that they had used a condom during anal sex the last time they were paid. Finally, the commercial sex with female partners was infrequent among RDS study participants.

Introduction

Commercial sex is thought to be associated with an increased vulnerability to HIV. Current research indicates that men who engage in commercial sex may have differential HIV risk compared to MSM who do not engage in commercial sex. However, there is conflicting evidence as to whether engagement in commercial sex is associated with increased risk-taking behaviour or a higher HIV prevalence.

A systematic review showed that worldwide regions in which the HIV epidemic is largely driven by sexual transmission and concentrated among MSM had also the largest disparities in the burden of HIV among men who engage in commercial sex. In Latin America, North America, and Europe, regions in which the HIV epidemic is concentrated among MSM, both absolute and relative measures of HIV burden among men engaging in commercial sex were high (Oldenburg, Perez-Brumer, Reisner, Mattie, Bärnighausen et al. 2014). Another systematic review confirms that HIV prevalence is elevated among MSM who engage in commercial sex as compared to MSM who do not. This supports existing literature that suggests that this subpopulation of MSM has different and increased risks associated with HIV vulnerability, and that there are geographic differences in these associations globally (Oldenburg, Perez-Brumer, Reisner, Mimiaga, 2015).

Finally, MSM who engage in commercial sex are a highly heterogeneous group, and a large percentage may identify as heterosexual or bisexual or may be married to women or have female primary and/or casual sexual partners (Landers, Closson, Oldenburg, Holcomb, Spurlock, Mimiaga 2014; Wong, Huang, He, Smith, Ding, et al. 2008; Prado Cortez, Boer, Baltieri 2011). This may not only act as an HIV transmission 'bridge' to the general population but means that MSM who engage in commercial sex may not be responsive to HIV prevention services that are designed specifically for gay-identified MSM.

In this current Section data are presented from the RDS cities only[1]. Specifically, findings on the percentages of men who have paid or been paid for sex in the last six months are reported. In addition, findings on the percentages of men who have paid or been paid for sex in the last six months with a woman are also reported.

Findings

Commercial sex

Commercial sex can be interpreted broadly as the exchange of sex for money, goods, drugs, or other items of value (including protection, housing, or food). In Sialon II, items in the RDS questionnaire were operationalised simply as either 'having paid' or 'having been paid' for sex. Moreover, in order to collect relevant data independently by self-identification as a 'sex worker', no distinction was made between individuals who self-identify as sex workers and engage in commercial sex regularly, and those who engage in commercial sex occasionally

and may not identify as such. Overall, the findings from the four RDS cities show that the vast majority of participants did not report commercial sex with the exception of Bucharest. Stratification by age for this variable was not possible due to the low numbers of participants who declared engaging in commercial sex activities. Instead, findings are presented aggregating all those who reported they either paid or were paid for sex at least once in the last six months.

MSM having *paid* for sex

Looking at the percentages of men who reported having paid for sex in the last six months, there was a variation between the cities which increased when the question was about having been paid. Participants were asked: *"In the last 6 months have you ever paid to have sex with men?"*, and; *"In the last 6 months have you ever been paid to have sex with men?"* Respondents could answer with the number of times this happened or write a zero if applicable. The percentages of men who reported *having paid* to have sex with a man in the last six months were higher in Bucharest (6.7%) and Bratislava (3.0%) and lower in Verona and Vilnius with similar figures (0.9%; see Table 5.7.1).

Table 5.7.1 Percentage of MSM having *paid* to have sex *with a man* in the last six months

City	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Sample Size
BRATISLAVA	**3.0**	1.4	4.1	0.9	16
BUCHAREST	**6.7**	3.3	10.1	0.9	12
VERONA	**0.9**	0.0	1.8	1.0	5
VILNIUS	**0.9**	0.1	1.7	0.7	5

MSM having *been paid* for sex

When participants were asked about having *been paid* for sex in the last six months, percentages were generally higher than for those who had paid for sex. For instance, the highest percentage was again found in Bucharest with 27.5% of participants reporting that they had been paid for sex; this is almost ten times lower than the percentage found in Vilnius (2.8%; Table 5.7.2). In general, the percentages of people reporting that they had been paid were much higher compared to those participants reporting that they had paid; with the only exception of Bratislava where the two figures were very similar.

Table 5.7.2 Percentage of MSM having *been paid* to have sex *with a man* in the last six months

City	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Sample Size
BRATISLAVA	**3.0**	1.3	4.6	1.3	13
BUCHAREST	**27.5**	19.0	36.0	1.7	48
VERONA	**6.1**	2.9	9.5	2.0	21
VILNIUS	**2.8**	0.7	4.9	1.6	9

Condom use by MSM *having been paid* to have sex

With regard to the use of a condom the last time participants reported having *been paid* to have anal intercourse, estimates varied from country to country (Table 5.7.3). Participants were asked: "*Last time you were paid to have anal intercourse, were you…*" and respondents could answer 'yes' or 'no' (or 'I prefer not to answer') to four items[2]: *'penetrated (fucked) with a condom?', 'penetrating (fucking) with a condom?', 'penetrated (fucked) without a condom?', 'penetrating (fucking) without a condom?'*[3]. In Bratislava, Bucharest, and Vilnius the majority of participants reported having used a condom during paid anal intercourse (64.3%, 58.0% and 78.4% respectively); whilst in Verona the large majority of participants reported unprotected anal intercourse the last time they had been paid for anal intercourse (69.5%).

Table 5.7.3 Use of a condom among MSM having *been paid* to have sex *with a man* the last time they were paid to have anal intercourse in the last six months

City	Use of condom	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Sample Size
BRATISLAVA	With	**64.3**	27.2	100	1.2	4
	Without	**35.7**	0	72.8	1.2	3
BUCHAREST	With	**58.0**	37.2	78.7	1.8	23
	Without	**42.0**	21.3	62.8	1.8	16
VERONA	With	**30.5**	29.7	29.7	0	10
	Without	**69.5**	70.3	70.3	0	8
VILNIUS	With	**78.4**	60.8	98.9	0.4	4
	Without	**21.7**	1.1	39.2	0.4	3

MSM having paid or been paid to have sex with a woman

In order to be able to explore the percentage of commercial sex with both men and women, and its significance in terms of a 'bridging' factor for possible HIV transmission to female partners , participants were asked: "*In the last 6 months have you ever paid or been paid to have sex with a woman?*" Respondents could state the number of times this happened respectively if they paid *("I have paid roughly ….")* or if they were paid ("*I have been paid roughly…*") or write zero if applicable. Commercial sex with women in the last six months (either paying or having been paid) was much less frequent than for commercial sex with men (Table 5.7.4). The highest percentage was found in Bucharest with 3.4% of respondents reporting commercial sex with women. In Vilnius nobody reported this behaviour.

Table 5.7.4 Percentage of MSM having paid or been paid to have sex with a woman in the last six months

City	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Sample Size
BRATISLAVA	**1.3**	-0.5	3.4	4.0	2
BUCHAREST	**3.4**	0.7	6.2	0.9	5
VERONA	**1.9**	-0.2	4.0	2.3	5
VILNIUS	**-**	-	-	-	-

Summary and conclusions

ìThe Sialon II RDS survey assessed a limited number of commercial sex related indicators. However, some indicators collected (such as the number of times respondents paid or were paid for sex) were collected, but were difficult to interpret particularly by city level due to the limited numbers of those reporting commercial sex. Nevertheless it was still possible to draw some key conclusions from our analysis of the data:

- The large majority of study participants reported low levels of involvement in commercial sex with the exception of Bucharest where 27.5% of respondents reported they had been paid in the last six months and 6.7% reported that they had paid for sex;
- The majority of those who had been paid for sex reported that they had used a condom during anal sex the last time they were paid; with the only exception of respondents in Verona where almost 70% reported not using a condom;
- Commercial sex with female partners was infrequent. The highest percentage was found in Bucharest (3.4%) in line with the highest percentages found for commercial sex with male partners.

This high number of MSM having *been paid* for sex in Bucharest, also much higher than the percentage of buying sex, could be due to lack of convergence of the recruitment chains for the drug use variable. In effect the samples contained a high proportion of people who use drugs, higher that could be expected in the source population.

Although there may be large differences in the definition of commercial sex which may influence how it affects HIV risk, this Section has only presented a first basic and descriptive analysis of the HIV risk measured as condom use in anal intercourse related to commercial sex. Future analysis should analyse whether: there are differences between MSM who engage in commercial sex compared with the broader general MSM population; whether reported commercial sex is a stable or occasional activity using 'number of times' as a proxy indicator, and; for behaviourally bisexual MSM who engage in commercial sex activities, whether there is a potential 'bridging' factor for possible HIV transmission to female partners.

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Endnotes

[1] Due to the practical constraints of data collection at the TLS venues which required a short as possible questionnaire, questions about commercial sex and condom use were only included for RDS sites.

[2] The use of an explicit description of the behaviour via a slang expression (e.g. fucked) was meant to clarify the question and to avoid potential misunderstandings. A preliminary qualitative piloting of the item (including translation to local languages) was carried out in order to ensure a correct understanding of the items related to commercial sex.

[3] Insertive or receptive anal intercourse was aggregated into a general 'anal intercourse' variable.

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5.8 High risk sex behaviour (fisting)

Summary

Despite some variations between the RDS cities, fisting was a relatively common practice among participants, at least once in their lifetime. Higher percentages of older participants (>40 years) reported ever having engaged in fisting behaviours compared to younger participants.

Introduction

Brachioproctic insertion or 'fisting' is a sexual practice involving the insertion of a hand, fist, or arm into a partner's rectum. Some research suggests that the practice can be a high risk behaviour for lesions and some STIs (Donovan, 1986; Fernández-Dávila, 2014; Fletcher, 2003). Although fisting or fingering the rectum carries a negligible risk of HIV transmission for the insertive or active partner (unless there is an open cut, sore or other wound or skin lesion on the hand), it can present a high risk for rectal tissue trauma for the receptive/passive partner (Cohen, 2004; De Bakker, 2012); increasing the probability of contracting blood borne diseases (Browne, 2004; Haar, 2013) and STIs such as Hepatitis B and C (Macdonald, 2014; McFaul, 2014; Rönn, 2011; Turner et al., 2006). For instance, whilst there have been few reported cases of HIV as a consequence of fisting, since 2000 there has been growing evidence of the Hepatitis C virus (HCV) infection spread among HIV-positive MSM associated with this practice (Urbanus, 2010; Va De Laar, 2010). Reported increases in HCV seroconversion among HIV-positive MSM in association with high risk sexual behaviours (including unprotected anal sex, fisting, and rimming) suggest an interaction between HIV and sexual practice. Fisting has consequently been identified as a possible risk factor for HCV acquisition for both the insertive and receptive partner (Van Kamseke, 2009; Ward, 2014).

In this Section, behavioural and biological data from the RDS cities on fisting and HIV (serum testing) are presented (in TLS cities, as HBV/HCV testing was not planned along with the need for questionnaires to be as short as possible given they were administered in gay venues, items on fisting were not included). For RDS cities, point estimates on fisting behaviours are provided (with Confidence Intervals and Estimated Design Effect) from two questionnaire items which differentiated between active fisting, passive fisting, and ever having engaged in fisting behaviour (i.e. lifetime; active, and/or passive). Findings are also stratified by age and by HIV status.

Unfortunately despite the relevance, comparison of fisting behaviour with biological data on HBV and HCV infections (from serum testing) are not presented due to very small sample sizes for those indicators (i.e. small numbers of positive cases). This is because sample sizes for the RDS cities were calculated on the basis of estimated HIV prevalence levels (from the former Sialon I project and other available data) rather than on estimated Hepatitis prevalence. However, full details of HBV and HCV prevalence can be found in Section 5.9.

Results

Fisting lifetime (active and/or passive) [1]

In general, engaging in fisting behaviour at least once in their lifetime (active and/or, passive) was fairly common among MSM in all RDS cities although there were some variations between cities (see Table 5.8.1). Percentages of participants who reported having ever engaged in fisting behaviours ranged from 10.5% in Vilnius to the highest of 34.1% in Verona. In Bratislava, the percentage of participants who reported fisting was

15.4%, whilst in Bucharest over one quarter of participants (27.5%) reported having practiced active or passive fisting at some point in their lifetimes.

Table 5.8.1 Percentage of MSM who reported having practiced fisting – lifetime (active and/or passive)

City	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Denominator
BRATISLAVA	**15.4**	10.9	19.6	1.88	377
BUCHAREST	**27.5**	21.2	33.8	0.887	171
VERONA	**34.1**	26.5	41.7	2.6	385
VILNIUS	**10.5**	6.1	14.4	1.73	314

Active fisting

The numbers of participants who reported active fisting (lifetime) were relatively low. Table 5.8.2 presents point estimates of active fisting behaviour, that is, the percentage of participants who replied 'yes' (in the last six months and/or lifetime) to the item "did you insert your hand into a man's rectum (fist-fucked him)?"[2]. The highest percentages of active lifetime fisting were reported by participants from Verona (29.5%) and Bucharest (23.7%). Lower percentages were reported by Vilnius (10.2%) and in Bratislava (13.3%) respectively.

Table 5.8.2 Percentage of MSM who reported having practiced active fisting – lifetime

City	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Denominator
BRATISLAVA	**13.3**	9.3	17.0	1.66	375
BUCHAREST	**23.7**	17.8	29.6	0.84	168
VERONA	**29.5**	22.3	36.7	2.50	379
VILNIUS	**10.2**	6.0	14.0	1.62	313

Passive fisting

The numbers of participants who reported passive fisting (lifetime) were relatively low although variations were observed between RDS cities. Table 5.8.3 presents point estimates of passive fisting behaviour, that is, the percentage of participants who replied 'yes' (in the last six months and/or lifetime) to the item "have you had a man's hand inserted into your rectum (got fist-fucked)?" The highest percentages of engaging in passive lifetime fisting were reported by participants from Verona (19.1%) and Bucharest (18.5%). Relatively lower percentages were reported by participants from Bratislava (11.4%), and even lower by participants from Vilnius (4.0%).

Fisting by city and age (active and/or passive) – lifetime

Some variations in lifetime fisting behaviour (active and/or passive) were evident when stratified by age (<30 years, 30-39 years, >40 years; see Table 5.8.4) although findings must be interpreted cautiously given the very small sample sizes in some cases. In Bratislava and Vilnius, higher percentages of older participants (>40 years) reported ever having engaged in fisting behaviours compared to younger participants. For instance, in Bratislava, younger participants (<30 years) reported fisting in 13.1% of the cases, whilst the percentage

Table 5.8.3 Percentage of MSM who reported having practiced passive fisting – lifetime

City	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Denominator
BRATISLAVA	**11.4**	7.4	15.6	2.20	377
BUCHAREST	**18.5**	13.2	23.8	0.81	168
VERONA	**19.1**	13.0	25.2	2.42	382
VILNIUS	**4.0**	1.3	6.7	1.73	310

Table 5.8.4 Percentage of MSM reported having practiced fisting (active or passive) lifetime by age

City	Age	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Denominator
BRATISLAVA	**<30**	**13.1**	8.1	17.5	2.09	207
	30-39	**17.8**	12.0	23.7	2.52	130
	>=40	**21.7**	12.0	23.3	1.09	40
BUCHAREST	**<30**	**23.3**	14.0	32.6	1.12	89
	30-39	**34.9**	23.2	46.7	0.907	57
	>=40	**27.0**	5.9	48.2	1.39	23
VERONA	**<30**	**36.3**	27.1	45.9	2.19	191
	30-39	**31.5**	19.6	44.3	2.68	108
	>=40	**31.0**	18.9	41.9	1.86	84
VILNIUS	**<30**	**8.2**	3.1	13.1	2.05	176
	30-39	**14.4**	5.8	20.8	2.28	98
	>=40	**18.2**	6.2	18.3	1.15	40

increased to 21.7% for older participants (>40 years). In Vilnius, the same pattern was observed; for younger participants (<30 years) only 8.2% of respondents reported ever having engaged in fisting behaviours whilst in older participants (>40), the percentage increased to 18.2%.

There were small variations in fisting behaviour by age reported by participants from Verona with percentages ranging from 31% (30-39 years, >40) to 36.3% (<30 years).

Finally, in Bucharest in the middle age category (30-39), the highest percentage of participants reporting fisting was observed (34.9%).

Fisting by city and HIV status

According to the literature, fisting behaviour may be associated with HIV status. However, the estimates presented here are limited by small numbers (both for HIV-positive participants and for those participants declaring fisting) so the results should be interpreted with caution.

Nevertheless, some differences were evident when fisting was stratified by HIV status (based on serum). Higher percentages of HIV-positive participants from Bratislava and Verona, reported engaging in fisting behaviours compared to HIV-negative participants. In Bratislava for example, the percentage of HIV-positive participants who reported fisting was 35.0% which dropped to 14.4% for HIV-negative participants. Similarly in

Verona, 53.6% of HIV-positive participants reported fisting compared to only 32.1% of HIV negative participants. However, in Bucharest no substantial differences were found between HIV negative (28.6%) and HIV-positive (23.2%) men in terms of fisting behaviour point estimates. Finally, in Vilnius (and in contrast to Bratislava and Verona), engaging in fisting was reported more often by HIV negative participants (10.6%) compared to just 3.0% by HIV-positive participants (although this finding is probably due to the small number of HIV-positive respondents). These point estimates are not precise due to the limited sample size, as can be seen by the wide confidence intervals. However, the use of weighted estimates provides a clear indication of its limitations.

Table 5.8.5 Percentage of MSM who reported having practiced fisting – lifetime (active and/or passive) by HIV status

City	HIV status	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Denominator
BRATISLAVA	HIV –	**14.4**	9.7	18.9	2.12	357
	HIV +	**35.0**	12.2	59.9	1.88	20
BUCHAREST	HIV –	**28.6**	20.9	36.3	1.04	137
	HIV +	**23.2**	11.2	35.2	0.72	34
VERONA	HIV –	**32.1**	25.2	39.1	2.2	353
	HIV +	**53.6**	27.7	79.5	2.4	32
VILNIUS	HIV –	**10.6**	5.8	15.2	1.88	306
	HIV +	**3.0**	0.0	8.9	0.261	8

Summary and conclusions

- Given the literature proposes links between high risk sexual behaviours including fisting and Hepatitis and HIV infection, in the RDS questionnaire (only) two behavioural items were included on active/passive, and lifetime fisting which could then in principle, be compared with participants' biological data on HIV, Hepatitis B, and Hepatitis C, from serum testing.
- CI and estimated DE demonstrate that the point estimates on fisting prevalence are robust. Despite some variations between the RDS cities, fisting was a relatively common practice among participants, at least once in their lifetime. The percentages of participants ever engaging in fisting (active and/or passive) ranged from 10.5% in Vilnius to 34.1% in Verona. In Bratislava, the percentage of participants who reported fisting was 15.4%, whilst in Bucharest over one quarter of participants declared to have practiced active or passive fisting in their life (27.5%).
- A limitation of the findings in this section is that despite the established link in the literature between fisting practices and Hepatitis infection, it was unfortunately not possible to compare fisting and tested HBV/HBC status due to limited sample sizes. This is because sample sizes for the RDS cities were calculated on the basis of estimated HIV prevalence levels rather than estimated Hepatitis prevalence. However, full details of HBV and HCV prevalence can be found in Section 5.9.

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Endnotes

[1] Fisting behaviour in RDS cities was assessed through two items focusing on the last six months representing active and passive behaviours respectively: In the last 6 months, did you insert your hand into a man's rectum (fist-fucked him)?; In the last 6 months, have you had a man's hand inserted into your rectum (got fist-fucked)? Respondents had the possibility to choose one of the following options: 'Yes'; 'No, I did it more than 6 months ago'; 'No, I have never done it'; and 'I prefer not to answer'. The second and third options were included to differentiate between participants who had never practiced fisting *vs.* those participants who had practiced it at least once in their life.

[2] The use of an explicit slang expression for fisting in the question items (fist-fucked) was deliberate to disambiguate the question and avoid potential misunderstanding (as for instance between fisting and fingering). Piloting of these items was carried out in order to ensure understanding of the questions.

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5.9 HIV and other STIs

Summary

In terms of HIV prevalence, data suggested that this varies between 2% and 20%, with higher rates among individuals older than 25 years of age. A relevant proportion (ranging between 12% and 88%) of participants were unaware of being HIV-positive. These findings are particularly alarming in terms of potential for new HIV outbreaks.

Introduction

HIV infection remains of major public health importance in Europe. The most recent surveillance data show that, despite significant efforts dedicated to the prevention and control of HIV, the rate of new HIV diagnoses has not declined in the EU/EEA and has increased substantially over the last decade in the European Region. HIV is mainly concentrated in key populations at higher risk of HIV infection. Specifically MSM show a persistent increase in new HIV diagnoses across Europe in the last decade (ECDC/WHO, 2014; ECDC, 2014), suggesting that current prevention and control efforts are not yet being delivered with sufficient effect and would need to be significantly strengthened.

Although populations most at risk vary across countries, it is recognised that in the countries of the European Union and the European Economic Area (EU/EEA) MSM are disproportionately affected by HIV and other sexually transmitted infections (STI). Despite numerous interventions targeting behaviour, knowledge and attitudes of MSM, increases of STI and HIV have been recently observed. Outbreaks of syphilis, lymphogranuloma venereum (LGV), hepatitis C viral infection (HCV) and other STI have been reported in multiple European cities suggesting high-risk sexual behaviour and extensive sexual networking (ECDC, 2013.)

Variables

Variables used for the present analysis are the following: city, age, country of origin, HIV status, syphilis status, hepatitis B serostatus, hepatitis C serostatus, HIV serostatus, and HIV serostatus knowledge.

HIV serostatus knowledge was based on HIV serostatus and answers to the questionnaire in the following mode:

- Known HIV-positive: positive anti-HIV test performed in Sialon II (on blood or saliva) and previous HIV positive test self-reported in the questionnaire;
- Newly diagnosed HIV-positive: positive anti-HIV test performed in Sialon II (on blood or saliva) and either no previous HIV test result or negative previous HIV test self-reported in the questionnaire;
- Indeterminate knowledge HIV-positive: positive HIV test result and contradicting or missing information on HIV serostatus, such as: self-reported positive but saliva test negative, no information on previous test result but previous test reported, or missing information on HIV serostatus.

Laboratory case definition

For the present analysis, we used laboratory results obtained from the laboratories working in 13 EU countries involved in Sialon II project, using the standard procedures reported in the "Handbook for HIV and STI testing in Sialon II study using RDS" and "Manual for HIV-testing from oral fluids in TLS study".

HIV:

- TLS arm: HIV serostatus was based on saliva sample. Oral fluid (OF) was collected with Oral Specimen Collection Devices ORACOLE at room temperature in gay venues. The quality of the OF samples found HIV-negative in HIV-testing was established by total IgG measurement using Human IgG ELISA kit (Immunology Consultants Laboratory, Inc.). Linked anonymous testing of HIV-antibodies from OF (with informed consent) was provided according to testing strategy recommended by WHO (WHO, 2009) using the following commercial ELISA diagnostic kits: Genscreen HIV ½ version 2 (BIO-RAD) and Vironostika HIV Ag/Ab (Biomerieux). An individual was defined HIV-positive when reactive to both ELISA tests.
- RDS arm: HIV serostatus was based on serum sample. Anti-HIV antibodies were assayed using a CE marked commercial fourth generation ELISA (detecting both Ag and Ab); an individual was defined HIV-positive when reactive to the ELISA Ag/Ab test and confirmed with Western Blot.

Syphilis: Syphilis serostatus was investigated in the RDS arm only and based on blood testing using a battery of serological tests. Treponemal tests included Treponema pallidum Haemoagglutination (TPHA), Treponema Pallidum Particle Agglutination (TPPA), Chemiluminescent Microparticle Immunoassay (CMIA). Non-treponemal test included Rapid Plasma Reagin (RPR). Overall seropositivity for syphilis was calculated including individuals reactive to a treponemal test having either a positive or a negative non-treponemal test. Seropositivity to both treponemal and at least one non-treponemal test suggested a probable active syphilis.

HBV: Hepatitis B serostatus was investigated in the RDS arm only and was based on the following serological markers: HBsAg, HBsAb, and HBcAb tested form serum using commercial CE marked diagnostic kits and following usual testing guidelines for these infections. The combinations of these markers (see box below) were used to identify different phases of HBV infection. An individual reactive to HBcAb and to either HBsAg or HBsAb was defined as 'exposed to HBV'.

HBV serological markers	Results	Interpretation of HBV serostatus
HBsAg HBsAb HBcAb	negative negative negative	Susceptible
HBsAg HBsAb HBcAb	negative positive negative	Immune due to hepatitis B vaccination (a)
HBsAg HBsAb HBcAb	positive negative positive	Acute or chronic infection (b)
HBsAg HBsAb HBcAb	negative positive positive	Immune due to natural infection (c)

Source: "Interpretation of Hepatitis B Serologic Test Results", Centers for Disease Control and Prevention (CDC), http://www.cdc.gov/hepatitis/HBV.

HCV: Hepatitis C serostatus was investigated in the RDS arm only and was based on serological test results for anti-HCV antibodies in the blood using commercial CE marked diagnostic kit. An individual reactive to both anti-HCV ELISA and LIA assays was defined as positive for HCV.

GARPR indicators

GARPR indicators are a set of core indicators to be used among different countries in order to monitor the HIV epidemic and the 2011 United Nations Political Declaration on HIV and AIDS (UNAIDS, 2014). In this paragraph, data referring to GARPR 1.14 indicator are provided.

The GARPR 1.14 refers to the HIV prevalence in MSM population. The prevalence was calculated from OF for TLS method (9 cities) and from serum samples for the RDS method (4 cities). As shown in Table 5.9.1, HIV prevalence estimates are different by city ranging from a minimum of 2.4% in Stockholm to a maximum of 18.0% in Bucharest.

Five cities had an HIV prevalence in the range 10-20% (Brussels, Barcelona, Lisbon, Brighton, Bucharest), four cities in the range 5-10% (Hamburg, Warsaw, Verona, Sofia), and four cities below 5% (Stockholm, Vilnius, Ljubljana, Bratislava). The highest prevalence was observed in Bucharest (18%); however, 37.7% of participants in this city reported having used injecting drugs. As mentioned in the introduction and methodology, this was due to the recruitment process occurred in Bucharest, where a sub-population of IDU-MSM was enrolled.

Table 5.9.1 HIV weighted prevalence among MSM, 95% confidence intervals, design effect and number of participants, by city (GARPR 1.14)

City	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Denominator
BARCELONA	**14.2**	10.1	19.5	1.2	400
BRATISLAVA	**4.3**	2.2	6.2	1.4	400
BRIGHTON	**17.6**	13.8	22.3	0.9	402
BRUSSELS	**12.3**	7.6	19.4	4.9	379
BUCHAREST	**18.0**	9.1	27.0	2.6	183
HAMBURG	**7.5**	3.9	13.8	3.6	390
LISBON	**17.1**	12.4	23.0	2.6	371
LJUBLJANA	**4.4**	2.1	8.9	1.8	347
SOFIA	**3.0**	0.9	9.1	0.8	361
STOCKHOLM	**2.4**	1.1	5.2	2.2	356
VERONA	**9.6**	4.5	14.9	3.5	400
VILNIUS	**3.4**	0.0	6.9	3.6	322
WARSAW	**7.2**	4.3	11.9	2.0	405

The prevalence according to age group is reported in Table 5.9.2. The sample size varied when stratified by age and city. Individuals younger than 25 years accounted for 10% to 30% of the participants included in the survey; the proportion of younger MSM was higher in Central/Eastern Europe than in Western Europe. The small number of HIV-positive participants younger than 25 years prevalence in Bratislava, Sofia and Verona hampered the calculation of confidence intervals for HIV prevalence. The highest prevalence among individuals younger than 25 years was observed in Bucharest: about 10% of individuals in this subgroup and 38% of HIV positive individuals reported injecting drugs.

Table 5.9.2 HIV weighted prevalence among MSM, 95% confidence intervals, design effect and number of participants, by city and age group. (GARPR 1.14)

City	Age	Point Estimate	95% Lower Bound	95% UpperBound	Estimated Design Effect	Denominator
BARCELONA	<25	**0.8**	0.1	6.6	0.5	42
	25+	**16.4**	12.4	21.5	1.2	358
BRATISLAVA	<25	**2.1**	0.0	4.7	1.5	118
	25+	**5.3**	1.8	8.4	2.2	282
BRIGHTON	<25	**2.9**	0.5	15.5	1.5	65
	25+	**20.7**	15.7	26.8	1.4	337
BRUSSELS	<25	**0.5**	0.1	4.3	0.3	49
	25+	**14.4**	8.6	23.0	3.1	330
BUCHAREST	<25	**11.6**	2.1	21.0	1.1	47
	25+	**18.5**	8.4	28.7	2.4	134
HAMBURG	<25	**1.9**	0.3	9.9	0.6	37
	25+	**8.1**	4.1	15.4	3.3	353
LISBON	<25	**1.2**	0.1	9.2	0.5	33
	25+	**18.9**	14.2	24.8	1.4	338
LJUBLJANA	<25	**1.4**	0.2	11.1	1.1	107
	25+	**5.3**	2.2	12.2	2.6	240
SOFIA	<25	**0.1**	0.0	16.1	0.1	99
	25+	**3.9**	1.0	14.0	4.1	262
STOCKHOLM	<25	**0.0**	0.0	0.0	-	73
	25+	**3.4**	1.5	7.4	1.3	283
VERONA	<25	**3.8**	0.0	9.6	3.0	104
	25+	**12.2**	3.8	20.8	5.6	293
VILNIUS	<25	**0.0**	0.0	0.0	-	83
	25+	**4.6**	0.4	9.2	3.3	239
WARSAW	<25	**1.6**	0.7	3.7	0.3	92
	25+	**9.7**	5.7	15.9	1.9	313

In most cities, HIV prevalence was higher among individuals older than 25 years compared to those youngerthan 25 years, except in Bucharest where it was similar in both groups. The highest prevalence among individuals younger than 25 years (excluding Bucharest) was observed in Sofia.

In all cities, HIV prevalence was higher among individuals older than 25 years compared to those younger than 25 years, except in Bucharest where it was similar in both groups (18.5% vs. 11.6%, respectively).

Similar prevalence estimates were reported in Sialon I for four out of five cities that were included also in Sialon II i.e. Barcelona, Bratislava, Ljubljana, and Verona. In Barcelona and Ljubljana, the same sampling method was used and similar HIV prevalence estimates were observed when comparing Sialon II with Sialon I: 14% vs. 17% in Barcelona, 4% vs. 5% in Ljubljana, respectively. In Bratislava and Verona the sampling method was different in Sialon II compared to Sialon I. Nevertheless, the HIV prevalence estimates were similar: in Bratislava 4% vs. 6%, in Verona 10% vs. 12%, respectively. Only in Bucharest, a higher prevalence was observed in Sialon II, which, as mentioned above, may be attributed to the high proportion of injecting drug user MSM

included in the sample (Mirandola et al., 2009). Explosive spread of HIV among intravenous drug users has been reported repeatedly in various countries and has occurred in southeast Europe in the context of economic crisis since 2010.

Table 5.9.3 shows the distribution of HIV positive MSM by HIV status knowledge: known HIV-positive, newly diagnosed HIV-positive, indeterminate knowledge HIV-positive.

Among HIV-positive individuals, the highest percentage of MSM aware of their serostatus was observed in Hamburg (75%), whereas the highest percentage of newly diagnosed was observed in cities of previous socialist countries, such as Sofia, Vilnius, and Bratislava (88,4%, 59.2%, 51.8%, respectively). Bucharest showed the highest percentage of MSM with indeterminate knowledge of their HIV-positive.

Table 5.9.3 Distribution (weighted percentage) of HIV-positive MSM by HIV status knowledge and city

City	Known HIV positive (%)	Newly diagnosed HIV positive (%)	Indeterminate knowledge HIV positive (%)	Denominator (N. of HIV positive individuals)
BARCELONA	50.9	28.9	20.2	62
BRATISLAVA	34.1	51.8	14.0	20
BRIGHTON	64.6	23.7	11.7	68
BRUSSELS	69.9	12.3	17.8	47
BUCHAREST	27.1	28.6	44.2	36
HAMBURG	74.5	18.3	7.3	50
LISBON	17.9	47.7	34.4	69
LJUBLJANA	31.6	35.9	32.5	16
SOFIA	4.0	88.4	7.6	17
STOCKHOLM	28.8	44.2	26.9	18
VERONA	57.8	33.1	9.1	32
VILNIUS	16.7	59.2	24.1	8
WARSAW	21.8	37.9	40.3	54

HIV prevalence among native-born and foreigner is shown in Table 5.9.4. Most cities showed a higher prevalence among native-born participants, being such difference quite relevant in a few cities such as Barcelona, Bratislava and Bucharest. In some cities (Brussels, Hamburg, Ljubljana, Sofia) the prevalence was similar in both groups, whereas in Lisbon and Vilnius a higher prevalence was found among foreign participants. The highest prevalence among foreigners was reported in Lisbon and among native-born in Barcelona.

Table 5.9.4 HIV weighted prevalence among MSM, 95% confidence intervals, design effect and number of participants, by city and origin. (GARPR 1.14)

City	Origin	Point Estimate	95% Lower Bound	95% UpperBound	Estimated Design Effect	Denominator
BARCELONA	Native-born	**18.9**	11.8	26.1	1.8	268
	Foreigner	**7.6**	1.4	13.7	1.3	130
BRATISLAVA	Native-born	**4.5**	2.1	6.6	1.6	386
	Foreigner	**0.0**	0.0	0.0	-	14

City	Origin	Point Estimate	95% Lower Bound	95% UpperBound	Estimated Design Effect	Denominator
BRIGHTON	Native-born	**18.5**	13.6	23.4	1.2	339
	Foreigner	**14.7**	2.4	27.0	2.0	60
BRUSSELS	Native-born	**12.6**	3.4	21.9	3.2	229
	Foreigner	**12.1**	4.1	20.0	2.9	150
BUCHAREST	Native-born	**18.6**	9.6	27.5	2.5	178
	Foreigner	**0.0**	0.0	0.0	-	5
HAMBURG	Native-born	**6.4**	2.5	10.3	2.2	338
	Foreigner	**7.0**	0.6	13.5	0.4	49
LISBON	Native-born	**16.0**	6.8	25.1	2.8	216
	Foreigner	**18.2**	9.8	26.5	2.1	155
LJUBLJANA	Native-born	**4.4**	0.4	8.3	2.6	303
	Foreigner	**5.1**	0.0	12.4	0.9	40
SOFIA	Native-born	**3.0**	0.0	6.8	3.7	351
	Foreigner	**2.0**	0.0	7.6	0.3	10
STOCKHOLM	Native-born	**2.5**	0.2	4.8	1.3	242
	Foreigner	**2.4**	0.0	5.6	1.0	114
VERONA	Native-born	**10.1**	1.1	19.4	9.7	334
	Foreigner	**6.4**	0.0	14.9	2.3	66
VILNIUS	Native-born	**3.3**	0.0	8.3	7.1	301
	Foreigner	**4.8**	0.0	13.5	1.0	21

Lab results for other Sexually Transmitted Infections (syphilis, HBV,HCV)

Serological tests for other STI were performed only in the four cities that used RDS (i.e. Bratislava, Bucharest, Verona, and Vilnius) because only in the RDS study design were blood samples taken.

Syphilis

Seropositivity for syphilis showing at least one positive treponemal test was similar to that reported for HIV in Bratislava and Bucharest, whereas in Verona and Vilnius was higher compared to HIV prevalence; the highest percentage was observed in Bucharest. Similarly to what observed for HIV prevalence, syphilis seropositivity showing at least one positive treponemal test was higher among individuals older than 25 years compared to those younger than 25 years, probably reflecting the increasing exposure to sexually transmitted agents with increasing age. This difference was lowest in Bucharest, where seropositivity among individuals younger than 25 years was the highest compared to other cities.

Table 5.9.5 Syphilis seropositivity[a] among MSM, 95% confidence intervals, design effect and number of participants, by city

City	Point Estimate	95% Lower Bound	95% UpperBound	Estimated Design Effect	Denominator
BRATISLAVA	**4.7**	2.2	7.2	1.9	400
BUCHAREST	**16.4**	9.0	23.8	1.9	183
VERONA	**12.7**	7.1	18.2	3.5	400
VILNIUS	**10.6**	5.5	16.1	3.0	322

[a] positive for TPHA or TPPA or CMIA

Table 5.9.6 Syphilis seropositivity[a] among MSM, 95% confidence intervals, design effect and number of participants, by city and age

City	Age	Point Estimate	95% Lower Bound	95% UpperBound	Estimated Design Effect	Denominator
BRATISLAVA	<25	**2.4**	0.0	5.4	1.8	118
	25+	**5.6**	2.5	9.0	1.9	282
BUCHAREST	<25	**12.5**	1.0	23.8	1.5	47
	25+	**17.4**	8.8	26.0	1.8	134
VERONA	<25	**0.4**	0.0	0.7	0.2	104
	25+	**17.9**	11.0	25.0	3.1	293
VILNIUS	<25	**4.6**	0.0	10.3	2.0	83
	25+	**12.8**	6.7	19.3	2.7	239

[a] positive for TPHA or TPPA or CMIA

Table 5.9.7 Syphilis seropositivity (probable active syphilis[a]) among MSM, 95% confidence intervals, design effect and number of participants, by city.

City	Point Estimate	95% Lower Bound	95% UpperBound	Estimated Design Effect	Denominator
BRATISLAVA	**1.4**	0.2	2.8	1.8	400
BUCHAREST	**9.7**	3.8	15.4	1.9	183
VERONA	**5.1**	2.0	8.3	2.5	400
VILNIUS	**0.1**	0.0	0.1	0.1	322

[a] positive for both TPHA or TPPA or CMIA and RPR

Seropositivity suggesting a probable active syphilis (positivity of both a treponemal and non-treponemal tests) was highest in Bucharest and lowest in Vilnius.

Table 5.9.8 Syphilis seropositivity among MSM, splitted by type of serological test and city

City	Seropositivity [a] (treponemal+ AND nontreponemal+ or nontreponemal-)	Splitted seropositivity		Denominator
BRATISLAVA	4.7	treponemal+ and nontreponemal+ [b] **(probable active syphilis)**	1.4	400
		treponemal+ and nontreponemal- [c]	3.3	
BUCHAREST	16.4	treponemal+ and nontreponemal+ [b] **(probable active syphilis)**	9.7	183
		treponemal+ and nontreponemal- [c]	6.7	
VERONA	12.7	treponemal+ and nontreponemal+ [b] **(probable active syphilis)**	5.1	400
		treponemal+ and nontreponemal- [c]	7.6	
VILNIUS	10.6	treponemal+ and nontreponemal+ [b] **(probable active syphilis)**	0.1	322
		treponemal+ and nontreponemal- [c]	10.5	

[a] positive for treponemal test (TPHA or TPPA or CMIA) and either positive or negative for RPR
[b] positive for treponemal test (TPHA or TPPA or CMIA) and positive for RPR
[c] positive for treponemal test (TPHA or TPPA or CMIA) and negative for RPR

Table 5.9.8 provides a summary of serological results for syphilis: overall, the highest proportion of MSM with positive serology for syphilis (i.e., reactive to a treponemal test and either a positive or a negative non-treponemal test) was observed in Bucharest (16.4%) and the lowest in Bratislava (4.7%) (confidence intervals and estimated design effect are not shown here because they are already presented in previous tables).

HBV vaccinated participants

Verona showed the highest proportion of participants immune to HBV probably due to HBV vaccination, as expected according to the age distribution of participants and the vaccination policy that started earlier in Italy compared to other European countries. This is also in line with the information available on the vaccination policies in the different countries.

Table 5.9.9 Percentage of MSM Immune due to hepatitis B vaccination[a], 95% confidence intervals, design effect and number of participants, by city.

City	Point Estimate	95% Lower Bound	95% UpperBound	Estimated Design Effect	Denominator
BRATISLAVA	**26.0**	20.8	30.6	1.7	400
BUCHAREST	**23.7**	13.9	33.4	2.6	183
VERONA	**44.9**	37.6	52.2	2.4	400
VILNIUS	**22.4**	16.6	28.1	1.9	322

[a] HBsAb positive, HBsAg negative, HBcAb negative

HBV infection

Among non-vaccinated individuals, Bucharest showed the highest and Bratislava the lowest HBV prevalence. The highest proportion of participants with an acute or chronic infection was observed in Bucharest. The

high prevalence of those exposed to HBV in Bucharest is probably associated with the high proportion of injecting drug users among participants.

Table 5.9.10 Positivity for hepatitis B[a] (HBV exposure, Immune due to natural infection, and acute or chronic infection) among MSM, 95% confidence intervals, design effect and number of participants, by city

City	Point Estimate		95% Lower Bound	95% UpperBound	Estimated Design Effect	Denominator
BRATISLAVA	**HBV exposure[a]**	**8.2**	4.2	11.9	1.8	289
	Immune due to natural infection[b]	**5.9**	2.7	8.9	1.6	289
	Acute or chronic infection[c]	**2.2**	0.0	4.7	2.5	289
BUCHAREST	**HBV exposure[a]**	**49.7**	36.9	62.5	2.4	141
	Immune due to natural infection[b]	**42.9**	29.5	56.3	2.7	141
	Acute or chronic infection[c]	**6.8**	0.2	13.4	2.5	141
VERONA	**HBV exposure[a]**	**30.4**	21.3	39.4	2.3	213
	Immune due to natural infection[b]	**27.6**	18.1	37.1	2.6	213
	Acute or chronic infection[c]	**2.8**	0.0	5.6	1.7	213
VILNIUS	**HBV exposure[a]**	**9.2**	8.7	9.5	1.2	250
	Immune due to natural infection[b]	**5.7**	2.9	8.1	1.0	250
	Acute or chronic infection[c]	**3.6**	0.7	6.5	1.8	250

[a] HBcAb positive and either HBsAg or HBsAb positive; point estimate calculated using the number of non-vaccinated individuals as denominator;
[b] HBcAb positive, HBsAg negative, HBsAb positive
[c] HBcAb positive, HBsAg positive, HBsAb negative

In all cities, the prevalence of those exposed to HBV was higher among individuals older than 25 years compared to those younger than 25 years.

Table 5.9.11 HBV exposure[a] among MSM, 95% confidence intervals, design effect and number of participants, by city and age

City	Age	Point Estimate	95% Lower Bound	95% UpperBound	Estimated Design Effect	Denominator
BRATISLAVA	**<25**	**2.6**	0.0	4.4	0.5	78
	25+	**10.2**	4.5	16.0	2.5	211
BUCHAREST	**<25**	**12.3**	0.0	25.7	1.2	26
	25+	**54.2**	40.2	68.1	2.3	113
VERONA	**<25**	**14.2**	3.8	24.2	1.2	52
	25+	**37.0**	25.3	49.2	2.6	158
VILNIUS	**<25**	**2.0**	0.0	5.0	0.5	35
	25+	**10.4**	5.7	14.9	1.5	215

[a] HBcAb positive and either HBsAg or HBsAb positive; point estimate calculated using the number of non-vaccinated individuals as denominator;

HCV

The prevalence of anti-HCV antibodies which reflects lifetime exposure to HCV infection, was the highest in Bucharest and the lowest in Vilnius. The high anti-HCV prevalence found in Bucharest is probably associated with the high proportion of injecting drug users among participants enrolled in the RDS study for this site.

Table 5.9.12 Positivity for antibodies against hepatitis C[a] among MSM, 95% confidence intervals, design effect and number of participants, by city.

City	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Denominator
BRATISLAVA	**1.4**	0.0	3.2	2.9	400
BUCHAREST	**22.8**	6.4	39.2	7.3	181
VERONA	**5.3**	0.0	11.7	9.1	400
VILNIUS	**0.9**	0.0	2.1	1.7	322

[a] anti-HCV positive

In Bratislava and Vilnius, no anti-HCV-positive participants were reported among individuals younger than 25 years. In Bucharest and Verona, individuals older than 25 years showed a higher anti-HCV prevalence compared to those younger than 25 years.

Table 5.9.12 Positivity for hepatitis C[a] among MSM, 95% confidence intervals, design effect and number of participants, by city and age.

City	Age	Point Estimate	95% Lower Bound	95% UpperBound	Estimated Design Effect	Denominator
BRATISLAVA	**<25**	0.0	0.0	0.0	0.0	118
	25+	2.1	0.0	4.3	2.4	282
BUCHAREST	**<25**	11.8	0.8	22.5	1.4	46
	25+	25.5	11.7	39.3	3.5	133
VERONA	**<25**	1.4	0.0	3.2	0.8	104
	25+	7.0	0.0	15.0	8.0	293
VILNIUS	**<25**	0.0	0.0	0.0	0.0	83
	25+	**1.2**	0.0	2.6	1.3	239

[a] anti-HCV positive

Co-infections

Co-infections of sexually transmitted infections are frequent due to the same transmission routes, which may facilitate the transmission of other STIs. Sexually transmitted co-infections are associated with atypical and generally more severe clinical features, more complications, resistency to treatment, unfavourable outcome, and worse prognosis. STIs may increase the likelihood of acquiring and the transmission of HIV infection (ECDC, 2013). Although populations most at risk vary across countries, it is recognised that in the countries of the European Union and the European Economic Areas MSM are disproportionately affected by HIV and other

STIs. Despite numerous interventions which targeted behaviour, knowledge and attitudes of MSM, increases in STIs and HIV have been recently observed. Outbreaks of syphilis, lymphogranuloma venereum (LGV), HCV infection and other STIs have been reported in various European cities suggesting high-risk sexual behaviour and extensive sexual networking. In addition, overall deficit of outcome evaluation has been observed in HIV/STI prevention interventions targeted at MSM (ECDC, 2013).

Overall, 14 participants with HIV-syphilis co-infection, 44 participants with HIV-HBV co-infection, and 29 participants with HIV-HCV co-infection were reported. However, the tests used to identify positivity for HCV are not markers of current infection but rather of exposure to the respective infectious agent. In syphilis it is also important to distinguish between primary or secondary and latent co-infection, and perhaps between current and past HIV infection and co-infections.

The number of co-infected HIV-positive individuals was low in all cities except in Bucharest where a high prevalence of HIV-HBV and HIV-HCV co-infections was observed; however, this high prevalence was probably associated with the high proportion of injecting drug users among participants in this city. The prevalence of HIV and syphilis co-infection was similar in Bucharest and Verona whereas no such cases were reported in Vilnius.

Table 5.9.13 Number of co-infected individuals, number of tested and weighted prevalence of HIV-syphilis[a], HIV-HBV[b], and HIV-HCV[c] co-infection, by city

City	HIV and syphilis		HIV and HBV		HIV and HCV	
	N. of co-infected / N. tested for syphilis and HIV	Prevalence (%)	N. of co-infected / N. tested for HBV and HIV	Prevalence (%)	N. of co-infected / N. tested for HCV and HIV	Prevalence (%)
BRATISLAVA	1/400	1.2	4/289	1.9	0/400	0.0
BUCHAREST	7/181	7.5	25/141	18.5	22/181	8.6
VERONA	6/400	5.9	13/213	7.1	7/400	2.7
VILNIUS	0/322	0.0	2/250	0.8	0/322	0.0

[a] HIV positive and TPHA or TPPA or CMIA positive
[b] HIV positive and HBcAb positive and either HBsAg or HBsAb positive
[c] HIV positive and anti-HCV positive

Summary and conclusions

HIV prevalence among MSM varies between 2% and 20%, with higher rates among individuals older than 25 years of age.

A relevant proportion (ranging between 12% and 88%) of participants was unaware of being HIV-positive.

Periodical serological testing for HIV, syphilis, HBV, and HCV should be actively offered to MSM.

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5.10 Treatment and viral load

Summary

In terms of viral load and treatment, consistent differences were reported across participating cities. In general, unsatisfactory treatment coverage and treatment adherence were reported in the Eastern European cities. In terms of HIV-positive MSM who had been diagnosed with HIV prior to the Sialon II study (known positives or 'aware') the percentage of participants on treatment was high with a median of 95.1%, whilst it should be noted that the continuum of care was quite different across cities.

Introduction

Viral load (VL) is the most important indicator of initial and sustained response to antiretroviral treatment (ART). As such, VL should be measured in all HIV-infected patients at initiation of therapy, and on a regular basis thereafter. Pre-treatment VL level is also an important factor in the selection of initial antiretroviral (ARV) regimens because several currently approved ARV drugs or regimens have been associated with poorer responses in patients with a high baseline viral load (Panel on Antiretroviral Guidelines for Adults and Adolescents, 2014).

Clinical trials have found that a decrease in VL following initiation of ART is associated with reduced risk of disease progression or death (Marschner et al., 1998; Murray, Elashoff, Iacono-Connors, Cvetkovich, and Struble, 1999; Thiébaut et al., 2000). Thus, VL testing is established as an essential marker to monitor treatment response ("Human immunodeficiency virus type 1 RNA level and CD4 count as prognostic markers and surrogate end points," 2000). Optimal viral suppression is defined generally as a VL persistently below the level of detection (HIV RNA <50 copies/mL). Isolated and temporary VL fluctuations, typically with HIV RNA <400 copies/mL, may occur in successfully treated patients and are not predictive of virological failure (Human immunodeficiency virus type 1 RNA level and CD4 count as prognostic markers and surrogate end points: a meta-analysis. HIV Surrogate Marker Collaborative Group, 2000). Furthermore, data on the association between persistent low but quantifiable viremia (HIV RNA <200 copies / mL) and virological failure should be taken into account (Laprise, de Pokomandy, Baril, Dufresne, and Trottier, 2013).

In addition to the benefit of therapy for patients with HIV, ART can play an important role in preventing HIV transmission (Das et al., 2010; Montaner et al., 2010). Lower levels of plasma HIV RNA have been associated with decreases in the concentration of the virus in genital secretions (Baeten et al., 2011; Graham et al., 2007; Sheth et al., 2009; Vernazza et al., 2000). Observational studies have revealed an association between low serum or genital HIV RNA and a decreased rate of HIV transmission among heterosexual serodiscordant couples (Baeten et al., 2011; Hughes et al., 2012; Quinn et al., 2000). A lack of virus transmission has also been confirmed for homosexual HIV serodiscordant couples, if the infected partner was on antiretroviral treatment and had a VL below the limit of detection (Baeten et al., 2011; Hughes et al., 2012; Quinn et al., 2000).

Effectively the coverage of successful treatment in different settings depends on the availability and uptake of testing, linkage to care and then retention in care and adherence to treatment. Analysis of continuum of care data shows that in many countries the percentage of HIV-positive people who are appropriately treated is far from optimal. Furthermore, there are different break points in the cascade, where the greatest loss occurs in different countries (Marcus et al., 2015; Raymond, Hill, and Pozniak, 2014) and between population subgroups (Millett et al., 2012; Singh et al., 2014).

In this Section, findings relating to treatment coverage and VL suppression are presented. Specifically, data are provided on the percentages of HIV-positive participants on ART (including those who are aware and not

aware of their serostatus), percentages of diagnosed HIV-positive participants on ART (i.e. known positives), as well as data on HIV-positive MSM who have undetectable VL and those on ART who have undetectable VL. The Section goes on to present data on continuum of care indicators for HIV-positive participants by city. In the final part of the Section, data are first presented on the percentages of HIV-positive participants with undetectable VL, by age and sampling method (TLS/RDS), and then on the percentage of HIV-positive MSM who used a condom at the last anal intercourse by VL status and sampling method.

Results

Treatment coverage and viral load suppression

To explore the extent of ART coverage and levels of VL suppression among MSM in TLS and RDS cities, participants were asked two questions: 1) "In case you are living with HIV: are you currently taking drugs for treatment for HIV (known as antiretroviral, ART, HAART)?" Possible responses included: 'yes', 'no' and 'I prefer

Table 5.10.1 Percentage of HIV-positive MSM on ART [1]

City	Residence*	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Sample Size
BARCELONA	Study city or <100km	**49.6%**	34.7%	64.5%	1.06	50
	Total	**47.3%**	31.9%	62.7%	1.12	52
BRATISLAVA	Total	**20.1%**	0.0%	50.0%	1.90	13
BRIGHTON	Study city or <100km	**65.0%**	30.9%	99.2%	2.60	54
	Total	**65.1%**	33.5%	96.7%	2.51	56
BRUSSELS	Study city or <100km	**82.9%**	61.4%	100.0%	1.70	33
	Total	**84.7%**	65.3%	100.0%	1.69	39
BUCHAREST	Total	**8.7%**	0.0%	27.6%	2.49	21
HAMBURG	Study city or <100km	**79.5%**	51.0%	100.0%	1.99	36
	Total	**78.9%**	54.3%	100.0%	1.95	41
LISBON	Study city or <100km	**14.7%**	1.5%	27.9%	0.76	36
	Total	**12.3%**	4.0%	20.5%	0.95	55
LJUBLJANA	Study city or <100km	**44.9%**	0.0%	91.1%	1.40	10
	Total	**36.9%**	0.0%	85.6%	1.71	12
SOFIA	Study city or <100km	**4.4%**	0.0%	13.8%	0.83	13
	Total	**4.3%**	0.0%	13.5%	0.83	14
STOCKHOLM	Study city or <100km	**21.8%**	0.0%	50.6%	1.06	10
	Total	**37.1%**	0.0%	77.4%	1.41	12
VERONA	Study city or <100km	**55.1%**	30.5%	79.7%	1.61	25
	Total	**51.5%**	27.8%	75.2%	1.66	28
VILNIUS	Total	-				7
WARSAW	Study city or <100km	**35.2%**	10.8%	59.6%	1.32	34
	Total	**36.5%**	14.9%	58.1%	1.41	39

* Only one estimate is provided if all respondents included in the table resided in the study city or within the 100 km (namely, participants from Bucharest, Bratislava, and Vilnius).

not to answer'; 2) To collect information on VL participants were asked: "In case you are living with HIV: what was your last viral load?" Possible responses included: 'undetectable', 'detectable', 'I do not remember / I don't know / I didn't get the result of the test' and, 'I prefer not to answer'.

HIV-positive MSM (aware and not aware) on ART

Given that testing and treatment coverage may vary in different geographical areas, in addition to the provision of an overall estimate of HIV-positive MSM on ART, estimates are also provided for those residing in the study city or within 100 km of their city (Table 5.10.1). The percentage of HIV-positive MSM (including those aware and not aware of their serostatus) who reported being on ART varied greatly across cities. The highest percentage was found in Brussels (84.7%) and Hamburg (78.9%) and the lowest in Sofia (4.3%) and Bucharest (8.7%) with a median of 37% across all cities (Table 5.10.1). However, the confidence intervals are wide and thus these estimates should be interpreted with caution.

ART coverage of MSM already diagnosed with HIV

Among MSM who had been diagnosed with HIV prior to the Sialon II study (known positives or 'aware') the percentage of participants on treatment was high with a median of 95.1% (Table. 5.10.2). Slightly lower estimates (but still high) were noted in Barcelona (77.3%), Ljubljana (78.6%), and Verona (80.5%). The second lowest point estimate (45.8% in Lisbon) was associated with very wide confidence intervals and should thus be interpreted cautiously. When excluding tourists the estimate in Lisbon exceeded 90%. The lowest estimate (although again with wide confidence intervals) was noted in Bucharest (18.0%), and may be influenced by the specific characteristics of the recruited sample (a large percentage of drug users). Due to very small sample sizes, estimates are not provided for Bratislava, Vilnius, and Sofia.

Table 5.10.2 Percentage of MSM diagnosed with HIV who receive ART

City**	Residence*	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Sample Size
BARCELONA	Total	77.3%	59.0%	95.6%	1.22	31
BRIGHTON	Study city or <100km	90.7%	77.6%	100.0%	1.39	40
	Total	91.4%	79.4%	100.0%	1.38	41
BRUSSELS	Study city or <100km	99.5%	98.5%	100.0%	0.42	26
	Total	99.6%	98.7%	100.0%	0.42	32
BUCHAREST	Total	18%	0.0%	57.2%	2.98	11
HAMBURG	Study city or <100km	98.4%	94.9%	100.0%	0.62	22
	Total	98.8%	96.3%	100.0%	0.56	25
LISBON	Study city or <100km	91.1%	77.8%	100.0%	0.35	16
	Total	45.8%	0.0%	96.2%	2.58	26
LJUBLJANA	Total	78.6%	43.5%	100.0%	0.87	5
STOCKHOLM	Study city or <100km	100.0%	-	-	-	7
	Total	100.0%	-	-	-	9
VERONA	Study country	79.3%	51.1%	100.0%	2.29	18
	Total	80.5%	54.7%	100.0%	2.24	20
WARSAW	Study city or <100km	100.0%	-	-	-	14
	Total	100.0%	-	-	-	17

* Only one estimate was provided if all respondents included in the table resided in the study city or within the 100 km (namely, Barcelona,

Bucharest, and Ljubljana).
** The table was reduced to exclude cities where the sample size was < 5: Bratislava (3), Sofia (2), and Vilnius (2).

MSM infected with HIV with undetectable viral load

The percentages of MSM infected with HIV with undetectable viral load (VL) were highly variable across TLS and RDS cities. In Bucharest, Sofia, and Vilnius, all HIV-infected participants, including those who had been diagnosed with HIV before the Sialon study already, and more than 90% of men infected with HIV in Bratislava and Lisbon, had detectable VLs (Table 5.10.3). This indicates problems regarding the quality of treatment in some of the study cities, an increased risk of rapid disease progression, and an increased probability of onward transmission.

Table 5.10.3 Percentage of MSM infected with HIV with undetectable VL

City	Residence*	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Sample Size
BARCELONA	Study city or <100km	**48.7%**	33.7%	63.7%	1.07	50
	Total	**46.5%**	31.0%	62.0%	1.13	52
BRATISLAVA	Total	**9.9%**	0.0%	25.5%	1.31	12
BRIGHTON	Study city or <100km	**68.0%**	34.6%	100.0%	2.56	53
	Total	**67.8%**	37.1%	98.5%	2.46	55
BRUSSELS	Study city or <100km	**78.5%**	59.2%	97.8%	1.42	34
	Total	**78.3%**	58.1%	98.4%	1.56	40
BUCHAREST	Total	**0.0%**	-	-	-	20
HAMBURG	Study city or <100km	**77.9%**	47.6%	100.0%	2.08	37
	Total	**76.3%**	49.8%	100.0%	2.06	43
LISBON	Study city or <100km	**7.8%**	0.0%	16.3%	0.79	37
	Total	**7.0%**	0.6%	13.4%	0.95	56
LJUBLJANA	Study city or <100km	**51.2%**	6.2%	96.3%	1.36	10
	Total	**42.1%**	0.0%	90.5%	1.66	12
SOFIA	Study city or <100km	**0.0%**	-	-	-	12
	Total	**0.0%**	-	-	-	13
STOCKHOLM	Study city or <100km	**22.7%**	0.0 %	51.7%	1.10	11
	Total	**37.7%**	0.0%	77.2%	1.44	13
VERONA	Study country	**49.1%**	3.3%	94.9%	5.07	23
	Total	**46.2%**	0.0%	100.0%	8.76	26
VILNIUS	Total	**0.0%**	-	-	-	6
WARSAW	Study city or <100km	**32.0%**	10.6%	53.4%	1.20	35
	Total	**33.6%**	14.1%	53.1%	1.31	40

* Only one estimate was provided if all respondents included in the table resided in the study city or within the 100 km (namely, Bratislava, Bucharest, and Vilnius).

Viral load in MSM diagnosed with HIV and receiving ART

In all cities the percentage of participants diagnosed with HIV and already receiving ART with undetectable VL exceeded 90% (see Table 5.10.4), with the exception of Lisbon where a greater percentage of participants reported high VLs. Due to very small sample sizes, estimates are not provided for Vilnius, Bratislava, Bucharest, Sofia, and Ljubljana.

Table 5.10.4 Percentage of MSM diagnosed with HIV and receiving ART with undetectable VL.

City	Residence	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Sample Size
BARCELONA	**Total**	**92.1%**	81.7%	100.0%	0.93	23
BRIGHTON	**Study city or <100km**	**99.6%**	98.6%	100.0%	0.40	32
	Total	**99.6%**	98.7%	100.0%	0.40	33
BRUSSELS	**Study city or <100km**	**96.6%**	91.0%	100.0%	0.80	24
	Total	**94.0%**	87.3%	100.0%	0.78	30
HAMBURG	**Study city or <100km**	**98.2%**	94.2%	100.0%	0.64	20
	Total	**98.6%**	95.8%	100.0%	0.57	23
LISBON	**Study city or <100km**	**100.0%**	-	-	-	14
	Total	**71.9%**	32.4%	100.0%	2.10	23
STOCKHOLM	**Study city or <100km**	**100.0%**	-	-	-	7
	Total	**100.0%**	-	-	-	9
VERONA	**Study country**	**98.0%**	96.4%	99.6%	0.04	13
	Total	**98.2%**	97.5%	98.9%	0.01	15
WARSAW	**Study city or <100km**	**93.3%**	84.3%	100.0%	0.51	14
	Total	**94.3%**	85.5%	100.0%	0.77	17

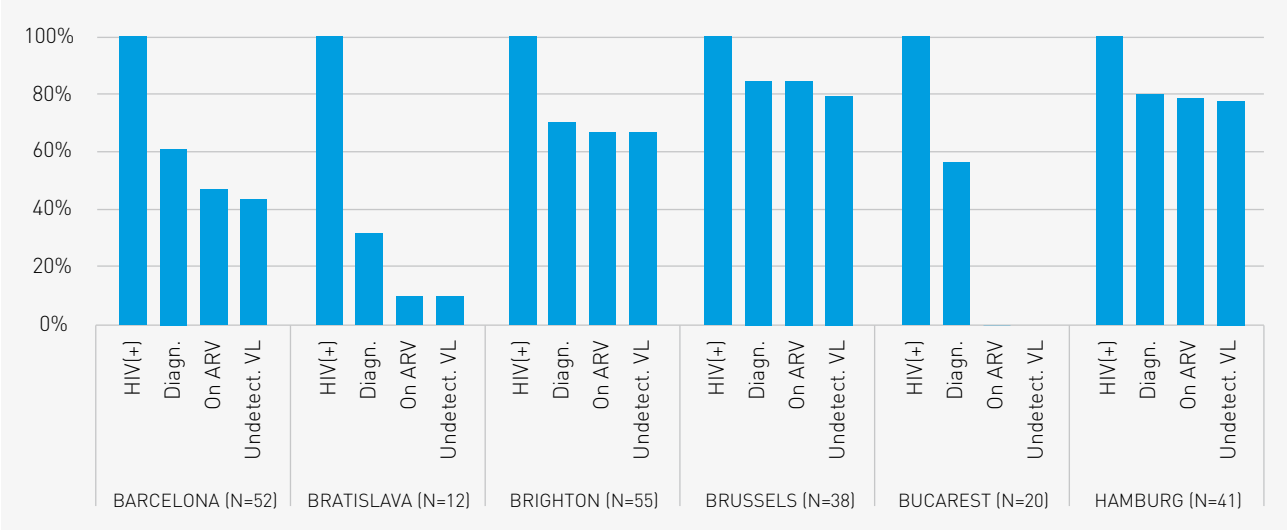
* Only one estimate was provided if all respondents included in the table resided in the study city or within the 100 km.
** The table was reduced to exclude cities where the sample size was < 5: Vilnius (1), Bratislava (1), Bucharest (1), Sofia (1), Ljubljana (3).

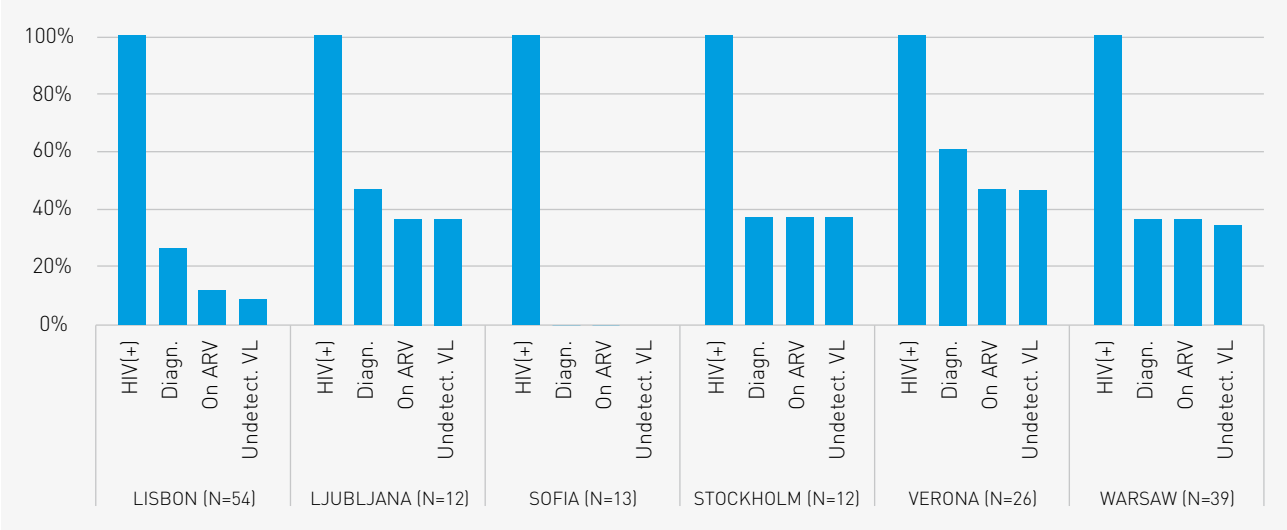
Continuum of care

Continuum of care was assessed on a subgroup of HIV-positive participants who provided valid data for all relevant elements (i.e. whether they were: diagnosed prior to participating in the Sialon II survey; on ART; and whether their VL was suppressed). In TLS cities 21.2% of HIV-infected participants (or 85 of 401) and 33.3% (or 32 of 96) of HIV-infected participants in RDS cities, were excluded due to missing values in one or more continuum of care indicators.

Due to small sample sizes when stratifying continuum of care by city, estimates are imprecise and should be interpreted cautiously. Keeping these limitations in mind, a fairly consistent feature across all the city-specific graphs is a substantial drop between the total of HIV-infected MSM and those diagnosed with HIV (Figure 5.10.1). These drops exceed 60% in Bratislava, Lisbon, Sofia, Stockholm and Warsaw. Drops at the level of linkage to care (between the diagnosed and those on treatment) are smaller with the exception of Bucharest. It can be concluded that a lack of diagnosis remains the main reason for which the percentages of MSM living with HIV, who have undetectable VL, are low. Linkage to care may represent an additional problem.

Figure 5.10.1 Continuum of care for HIV-positive MSM, by city (excluding Vilnius)





Viral load, age, and condom use

Once again, due to limited sample sizes disaggregated estimations for VL by age and condom use were not feasible by city. For this subsection, data are therefore presented without city disaggregation and hence estimates are un-weighted. However, separate estimates are presented for data arising from TLS and RDS sampling methods.

In terms of age, the percentage of HIV-infected participants with undetectable VL was higher among older MSM exceeding half among those aged 45 or more. In the younger age groups this percentage was much lower, especially in the RDS cities (Figure 5.10.2). In several RDS cities, estimates of treatment coverage were generally low.

Figure 5.10.2 Percentage of HIV-infected MSM with undetectable VL, by age, and sampling method (unweighted)

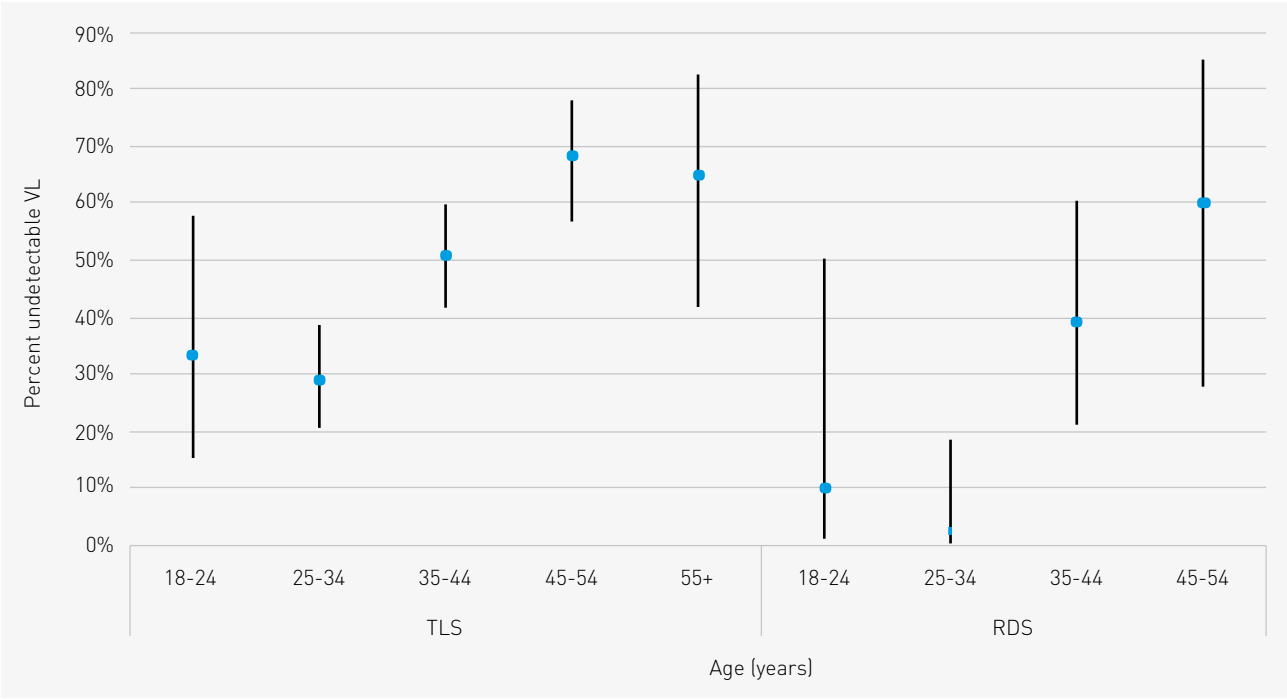
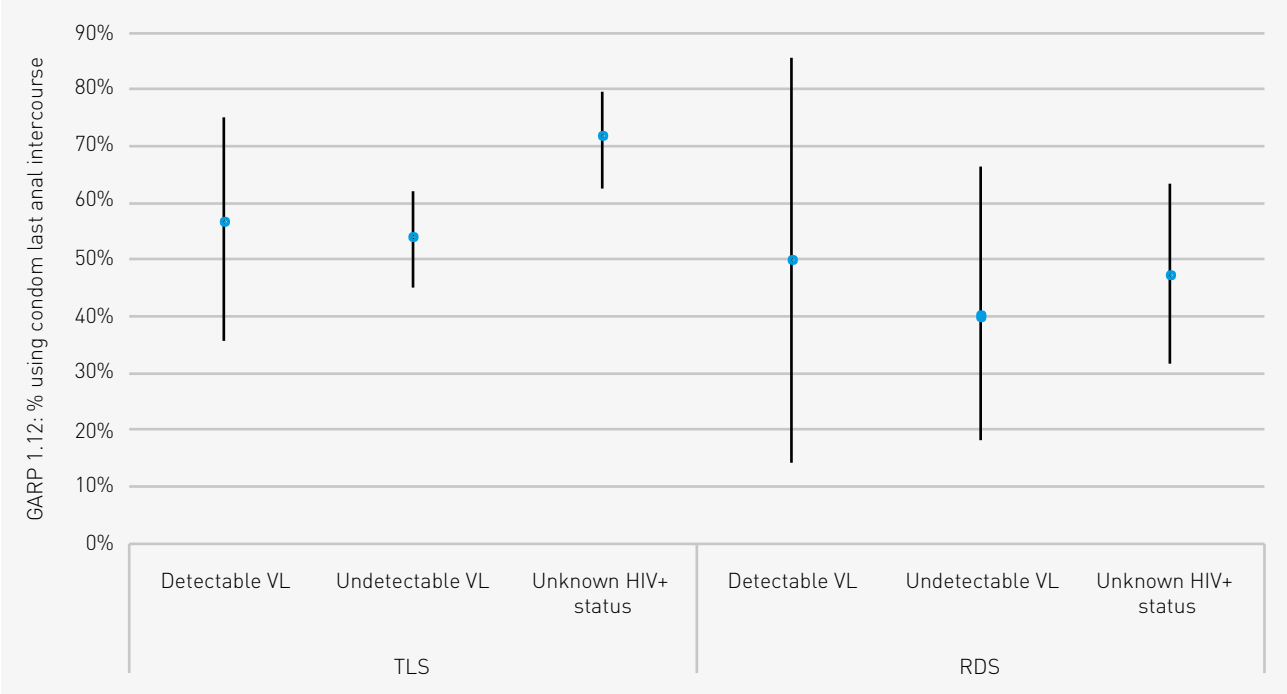


Figure 5.10.3 depicts the differences in condom use during last anal intercourse (GARPR 1.12) by awareness of HIV status and VL. In TLS cities those who did not know their HIV status were significantly more likely to use a condom although no significant differences were observed in RDS cities. In addition, no significant differences in condom use were found among HIV-positive MSM with self-reported detectable VL compared to individuals with self-reported undetectable VL.

Figure 5.10.3 Percentage of HIV-positive MSM who used a condom at last anal intercourse (GARPR 1.12), not aware of HIV status and aware of HIV status by VL, by sampling method (un-weighted)



Summary and conclusions

- By using the VL as a marker for the coverage with and the quality and success of treatment, significant differences were found across different European cities. In general, unsatisfactory indicators were reported in most Central and Eastern European cities (Sofia, Bucharest and Vilnius), but also in Lisbon.
- Much higher treatment coverage and, consequently, a higher percentage of HIV-positive MSM who had undetectable VL was attained in Western European cities (Brussels, Hamburg, Brighton and Verona).
- The break points in the continuum of care were different in different cities. However, the lack or delay in diagnosis is a crucial factor in all areas.
- In several cities, the treatment coverage may be less than optimal even among the individuals who have been diagnosed with HIV, indicating potential challenges in linkage to care and retention in care. This subject merits further research since due to limited sample sizes it was not possible to obtain precise estimates.
- Among HIV-diagnosed participants on ART the percentage of persons with undetectable VL was high, indicating good adherence and appropriate quality of treatment across the participating cities.
- Age of the participants was found to be related to effective suppression of viral replication, which is consistent with previous studies. More attention should be paid to ensuring the continuum of care for younger MSM.
- Finally, it should be noted that condom use is poorly reported even among persons with diagnosed HIV infection who knew that their VL was high. However, these observations may be limited by the type of partner (steady/non-steady) in conjunction with the perception of the respondents whether the intercourse was serodiscordant or seroconcordant. Although small sample sizes limited the possibility of stratified analysis, it is nonetheless clear that counselling for HIV-positive MSM should be strengthened.

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Endnotes

[1] The **first indicator** is referring to the percentage of HIV-positive MSM (positive OF or blood test), who are on ART. Numerator: number of MSM living with HIV and taking ART drugs (answered 'Yes' to Question 33). Denominator: number of MSM, who were positive in their OF/blood test and who either did not know earlier that they were positive (answered to Question 32 'HIV negative', 'Indeterminate', 'Did not get the results' or answered 'Never tested' to Question 31) or knew that they were HIV-positive and reported their treatment status (answered 'Yes' or 'No' to Question 33).

[2] The **second indicator** is the percentage of MSM already diagnosed with HIV who are on ART. Numerator: number of MSM living with HIV

and taking ART drugs (answered 'Yes' to Question 33), who were positive in their OF/blood test. Denominator: number of MSM living with HIV, who reported their treatment (answered 'Yes' or No' to Question 33), who were positive in their OF test. Inconsistent answers were excluded.

[3] The **third indicator** is the percentage of HIV-positive MSM, who have suppressed VL

Numerator: number of MSM living with HIV and having undetectable VL (answered 'Undetectable' to Question 34), who were positive in their OF/blood test. Denominator: number of MSM, who were positive in their OF/blood test and who either did not know earlier that they were positive (answered to Question 32 'HIV negative', 'Indeterminate'. 'Did not get the results' or answered 'Never tested to Question 31) or knew that they were HIV-positive and reported their VL (answered 'Detectable' or 'Undetectable' to Question 34).

[4] The **forth indicator** is the percentage of HIV-positive MSM *on treatment*, who have suppressed VL. Numerator: number of MSM living with HIV and having undetectable VL (answered "Undetectable" to Question 34), who were positive in their OF/blood test and reported being on treatment (answered 'Yes to Question 33). Denominator: number of MSM, who were positive in their OF/blood test and reported being on treatment (answered 'Yes' to Question 33), and reported their VL (answered 'Detectable' or 'Undetectable to Question 34).

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5.11 Sexual health

Summary

The level of satisfaction with one's sexual life was generally high with three quarters or more of all participants reporting being satisfied. The percentage of MSM who reported being unsatisfied with their sex lives was generally lower than 25% across all cities.

The level of "outness" and the perceived "homonegativity" differed substantially between the study areas. In Eastern European cities where homosexuality has been decriminalised relatively recently, men were less likely to be out regarding their sexual attraction to men. In this type of scenario, the use of the RDS method seemed to be very efficient in reaching more hidden MSM populations, particularly for MSM who had never tested for HIV/STIs.

Introduction

In this Section a brief analysis of the sexual health indicators included in the Sialon II TLS survey are presented. Three sexual health indicators were measured including: sexual satisfaction; sexual safety, and; sexual autonomy. 'Sexual satisfaction' is presented by city, and then stratified by age and sexual practices, as these factors may potentially influence how MSM perceive their sexual satisfaction. This analysis was done in order to understand reasons for sexual dissatisfaction, which in turn may help to understand in which groups or at which level to intervene to reduce sexual dissatisfaction. A potential association with HIV-status would be interesting to look at but was difficult to interpret meaningfully in the current sample due to very low numbers of HIV-positive men at the city level. The Section concludes by presenting the sexual health indicators on perceived 'sexual safety' and 'sexual autonomy' which were only assessed in the RDS cities.

The indicators used were developed based on a comprehensive conceptual framework which sets out recommendations for sexual health indicators (Toskin et al. 2013). This framework acknowledges that human sexuality is underpinned by core concepts of autonomy, well-being, and the fulfilment, promotion, and protection of human rights; emphasising individual autonomy in relation to sexuality. It also refers to individuals' rights to self-determination in sexual health. The framework recognises that concepts including sexual pleasure, intimacy, and social values in relation to sexuality, as well as a diverse range of gender identities are often overlooked in the design and implementation of programmes and policies (Hawkes et al. 2014). In line with these principles, HIV/STI prevention should aim at the promotion of safe, satisfying, responsible and autonomous sexual lives.

The relationship between sexual well-being and sexual risk taking is complex. For instance, partner-related factors and sexual satisfaction have been found to be associated with gay male couples engaging in UAI (Davidovich et al. 2006). Sexual risk behaviour (such as intentional condom-less sex among gay men in HIV risk contexts; Bauermeister et al. 2009) has been understood as an expression of sexual intimacy. However, other sexual health-related aspects such as how much people feel in control over their sexual health, operationalised as perceived sexual safety, may potentially contribute to less sexual risk taking (Robinson et al. 2002).

Previously, sexual satisfaction has been operationalised as being happy with one's sex life, and thus increasing sexual happiness becomes a goal in itself for sexual health programmes (EMIS, 2013). The EMIS survey conducted among MSM found that sexual unhappiness is widespread among MSM, with the median value of the percentage of men being unhappy with their sex lives across the countries at 47%. Determinants of sexual unhappiness included: concealment of sexual identity; living in small settlements; having never been tested for HIV; having a medium level of education, and; being in the younger and older age groups. A majority of men also

reported that a reason for their sexual unhappiness included lacking a regular sexual partner (typically, 25% in each participating country stated being single as the reason for being unhappy; EMIS 2013). Against this background, assessing sexual satisfaction, safety and autonomy may thus provide a better understanding of HIV/STI prevention and risk behaviour in the current study population.

Results

Sexual satisfaction

In both TLS and RDS cities, most participants reported high levels of satisfaction with their sex lives with little variation between cities (Table 5.11.1) in response to being asked: "How satisfied are you with your sex life?" (options provided were: "very satisfied; satisfied; somewhat unsatisfied; very unsatisfied; I prefer not to

Table 5.11.1 Percentages of MSM reporting sexual satisfaction

City	Sexual satisfaction	Point Estimate (%)	95% Lower Bound	95% Upper Bound	Estimated Design Effect	SE (%)	Denominator
BARCELONA	Satisfied	**82.9**	77.9	87	0.9	2.3	312
	Unsatisfied	**17.1**	13	22.1	0.9	2.3	74
BRATISLAVA	Satisfied	**75.8**	70.6	81.3	2	2.7	278
	Unsatisfied	**24.2**	18.7	29.4	2	2.7	91
BRIGHTON	Satisfied	**77.7**	69.4	84.2	2.4	3.8	305
	Unsatisfied	**22.3**	15.8	30.6	2.4	3.8	96
BRUSSELS	Satisfied	**82.9**	74	89.2	6.4	3.8	306
	Unsatisfied	**17.1**	10.8	26	6.4	3.8	75
BUCHAREST	Satisfied	**84.6**	77	92.2	1.8	3.9	127
	Unsatisfied	**15.4**	7.8	23	1.8	3.9	31
HAMBURG	Satisfied	**76.2**	68.1	82.7	3.3	3.7	284
	Unsatisfied	**23.8**	17.3	31.9	3.3	3.7	109
LISBON	Satisfied	**85.2**	81.3	88.4	1.6	1.8	336
	Unsatisfied	**14.8**	11.6	18.7	1.6	1.8	62
LJUBLJANA	Satisfied	**73.3**	67.4	78.4	1.3	2.8	281
	Unsatisfied	**26.7**	21.6	32.6	1.3	2.8	103
SOFIA	Satisfied	**60.2**	53.3	66.7	0.4	3.4	212
	Unsatisfied	**39.8**	33.3	46.7	0.4	3.4	198
STOCKHOLM	Satisfied	**74.6**	66.7	81.1	3.9	3.7	253
	Unsatisfied	**25.4**	18.9	33.3	3.9	3.7	92
VERONA	Satisfied	**75.6**	68.1	82.9	3.5	3.8	288
	Unsatisfied	**24.4**	17.1	32	3.5	3.8	84
VILNIUS	Satisfied	**77.8**	71.8	83.4	1.8	3	239
	Unsatisfied	**22.2**	16.7	28.3	1.8	3	59
WARSAW	Satisfied	**71.1**	65.2	76.3	1.4	2.8	281
	Unsatisfied	**28.9**	23.7	34.8	1.4	2.8	104

answer"). Across most cities, percentages of men reporting satisfaction with their sex lives ranged around 75% or above, except for Ljubljana and Warsaw (where 73.3% and 71.1% respectively reported satisfaction). The highest percentages of men being satisfied with their sex lives in TLS cities were found in Lisbon with 85.2% followed by both Barcelona and Brussels with 82.9%, and in RDS cities in Bucharest with 84.6%.

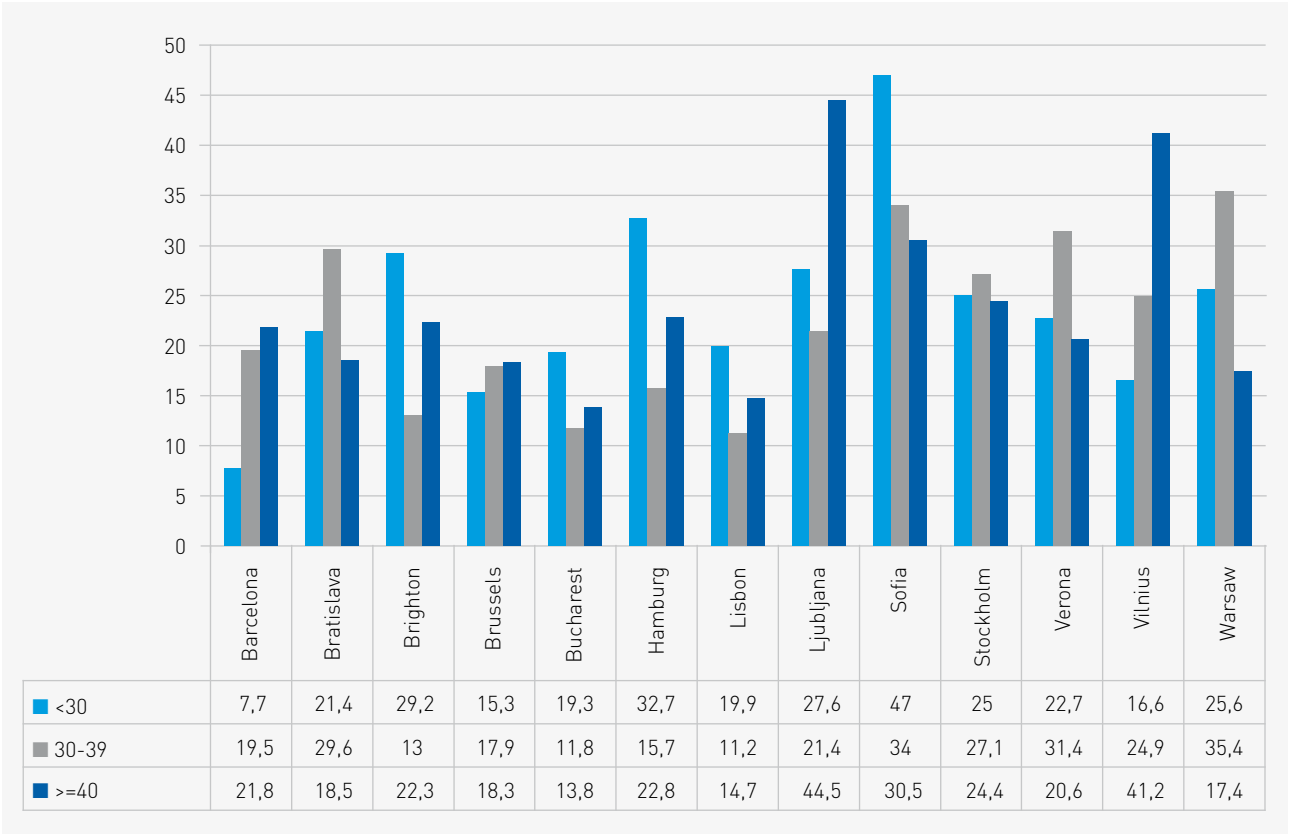
When looking at the percentages of men who reported being unsatisfied with their sex lives, there were considerable differences between the cities. In TLS cities, the percentages of men reporting being unsatisfied with their sex lives ranged from as low as 14.8% in Lisbon and 17.1% in both Brussels and Barcelona, to a high of 39.8% in Sofia. With the exemption of the latter, fewer than one in four of all MSM included in the study reported being unsatisfied with their sex lives. No clear differential pattern was evident between TLS cities and RDS cities. For RDS, percentages of MSM unsatisfied with their sex lives ranged from 15.4% in Bucharest to 24.4% in Verona.

To aid visualisation, in the sub-sections that follow, data are presented as percentages of MSM who reported to be unsatisfied with their sex lives stratified by the respective variables (i.e. age and sexual practices).

Sexual dissatisfaction by age group

Increasing age has been identified as one of the important factors associated with being sexually unsatisfied in gay and heterosexual men alongside other factors such as psychological health, and expectations towards sexual relationships (Herdt et al. 2004). To stratify sexual dissatisfaction by age group the following age categorisations were used: younger than 30 years of age, 30-39 years of age, and above 40. Figure 5.11.1 shows the percentage of respondents in each city who reported being unsatisfied with their sex lives stratified by age. Among those who were unsatisfied with their sexual lives, MSM younger than 40 years reported the highest levels of sexual dissatisfaction in cities such as Sofia and Hamburg (47% and 32.7% respectively[1]). In contrast,

Figure 5.11.1 Percentages of MSM reporting sexual dissatisfaction by age groups (%)



	Barcelona	Bratislava	Brighton	Brussels	Bucharest	Hamburg	Lisbon	Ljubljana	Sofia	Stockholm	Verona	Vilnius	Warsaw
<30	7,7	21,4	29,2	15,3	19,3	32,7	19,9	27,6	47	25	22,7	16,6	25,6
30-39	19,5	29,6	13	17,9	11,8	15,7	11,2	21,4	34	27,1	31,4	24,9	35,4
>=40	21,8	18,5	22,3	18,3	13,8	22,8	14,7	44,5	30,5	24,4	20,6	41,2	17,4

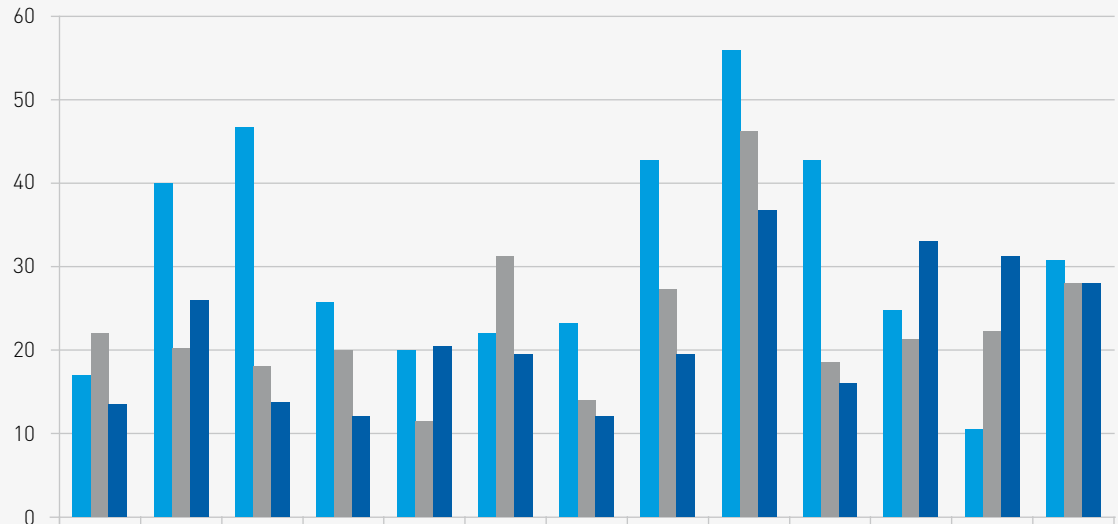
1 However, the smaller sample sizes have to be taken into account when interpreting the data.

in cities such as Ljubljana and Vilnius (44.5% and 41.2% respectively) it was older participants (40≥ years) who reported to be unsatisfied with their sexual lives.

Sexual dissatisfaction by type of sexual practice

In this sub-section, the percentages of respondents who reported to be unsatisfied with their sex lives are stratified by city and by type of sexual practice (no anal intercourse=no AI; protected anal intercourse=PAI, and; unprotected anal intercourse=UAI; Figure 5.11.2). In many cities, the highest percentages of participants who were unsatisfied with their sex lives were also those who reported having had no AI. In cities including Bratislava, Brighton, Ljubljana, and Stockholm percentages were all about 40% for this sub-group with the highest in Sofia (56.9%). No clear trends were evident from the data with respect to a potential difference between participants who reported PAI (red bars) versus those who reported UAI (green bars). In Sofia, participants generally reported higher levels of sexual dissatisfaction than in other cities, although this is likely to be due to a smaller sample size.

Figure 5.11.2 Percentages of MSM reporting sexual dissatisfaction by type of sexual practice (in %)



	Barcelona	Bratislava	Brighton	Brussels	Bucharest	Hamburg	Lisbon	Ljubljana	Sofia	Stockholm	Verona	Vilnius	Warsaw
No AI	17,4	40,8	47,6	26,2	20,4	22,5	23,6	43,5	56,9	43,6	25,2	10,8	31,2
PAI	22,3	20,5	18,2	20,4	11,8	31,8	14,2	27,6	47	18,8	21,7	22,7	28,4
UAI	13,8	26,5	14,1	12,2	20,8	19,8	12,1	19,8	37,5	16,2	33,5	31,9	28,5

Perception of sexual safety and sexual autonomy (RDS only)

Due to the practical constraints of administering questionnaires in TLS venues, which required questionnaires to be as short as possible, only in RDS sites were questions on 'sexual safety' and 'autonomy' included. The item on sexual safety was operationalised as the ability to use condoms and asked for participants to indicate their agreement to the following statement: "In the last 12 months, I have been able to use condoms as often as I wanted to." Similarly, sexual autonomy was measured by agreement to: "In the last 12 months, I have been able to refuse sexual intercourse and practices, I don't want". Participants rated both items on a four point-Likert scale ranging from "strongly disagree; rather disagree; rather agree; to strongly agree". [1]

With regards to perceived sexual autonomy (see Table 5.11.2), more than 85% of participants from all cities reported that they had always been able to refuse a condom as often as they wanted to. 86.5% of respondents from Bratislava, 91% from Bucharest, 87% from Verona, and 91.6% from Vilnius either strongly agreed or agreed to the given statement, suggesting that they perceived themselves to be in control of consensual sex. However, approximately 1 in 5 of participants from Verona and Bratislava reported not being able to refuse unwanted sexual activity.

Table 5.11.2 Perception of sexual autonomy (RDS cities only)

City	Perception of sexual autonomy	Point Estimate (%)	95% Lower Bound	95% Upper Bound	Estimated Design Effect	SE (%)	Denominator
BRATISLAVA	High	**86.5**	82.2	91	1.8	2.2	290
	Low	**13.5**	9.1	17.8	1.8	2.2	44
BUCHAREST	High	**91.0**	83.7	98.4	2.5	3.8	131
	Low	**9.0**	1.6	16.3	2.5	3.8	12
VERONA	High	**87.0**	82.2	91.9	2	2.5	273
	Low	**13.0**	8.1	17.8	2	2.5	43
VILNIUS	High	**91.6**	88.1	95.4	1.6	1.9	266
	Low	**8.4**	4.6	11.9	1.6	1.9	27

In terms of sexual safety (see Table 5.11.3), the percentages of participants who reported that they either strongly agreed or agreed that they had always been able to refuse sexual activity as often as they wanted to were high; ranging from 79.7% in Bratislava to 93.7% in Vilnius suggesting that more than three out of four men feel in control of their sexual behaviour.

Table 5.11.3 Perception of sexual safety (RDS cities only)

City	Perception of sexual safety	Point Estimate (%)	95% Lower Bound	95% Upper Bound	Estimated Design Effect	SE (%)	Denominator
BRATISLAVA	High	**79.7**	74.7	84.7	1.8	2.6	278
	Low	**20.3**	15.3	25.3	1.8	2.6	70
BUCHAREST	High	**89.2**	82.5	96	1.8	3.4	127
	Low	**15.4**	4	17.5	1.8	3.4	17
VERONA	High	**80.3**	74	86.7	2.4	3.2	253
	Low	**19.8**	13.3	26	2.4	3.2	66
VILNIUS	High	**93.7**	91	96.7	1.3	1.5	284
	Low	**6.3**	3.3	9	1.3	1.5	22

Summary and conclusions

- Sialon II assessed a limited number of sexual health indicators guided by a comprehensive conceptual framework for sexual health. The only indicator assessed at *all* data collection sites was sexual satisfaction; sexual safety and sexual autonomy were only assessed at in RDS cities. While sexual satisfaction has been concep-

tualised as a complex construct consisting of emotional, relational, physical, and cultural dimensions (Štulhofer et al., 2014), the survey could not address all these aspects. Such an objective was beyond the scope of SIALON II. However, in the context of this study, sexual satisfaction (as well as sexual safety and sexual autonomy for the RDS population) served as feasible and acceptable proxy measures for sexual well-being.

- Reported levels of sexual satisfaction were generally high with three quarters or more of all participants generally reporting being satisfied with their sex lives (with the exception of Sofia, where six out of ten men reported to be sexually satisfied). The percentage of MSM who reported being unsatisfied with their sex lives was generally lower than 25% across all cities. Such levels are markedly lower when compared to findings of the EMIS study, which found a median value of 47% of study participants being 'unhappy' about their sex lives. This could reflect a difference in wording as well as the influence of different data collection methods, for instance in settings where people socialise for seeking sex.
- The current findings are limited in that it was not possible to correlate the sexual satisfaction measured in TLS and RDS cities with context dependent variables (e.g. local social and/or sexual norms, availability of sexual health services, existing sexual health policies, legal contexts etc.) that may influence how freely MSM can live their sexual lives. Consequently, the current data should be subject to further secondary and more in-depth analysis that is impossible to present here. It could also be interesting with respect to a composite sexual health indicator (i.e. the three variables combined, currently only available for the RDS population), which may serve as a proxy measure of general sexual well-being in the target population.
- While the overall sample size for the study was large, disaggregating sexual satisfaction by age and sexual practice at the city-level resulted in small numbers making it difficult to draw general conclusions. Therefore, these findings have to be interpreted with caution and certainly cannot be generalised. Similarly, although associations by HIV-status could be theoretically interesting to look at, the numbers were too small for further interpretation.
- Looking at associations with age, the findings trends showed that participants tended to be more satisfied with their sexual lives when they were in the middle age group (30-40 years) compared to either the younger or the older age groups. This finding is consistent with EMIS findings.
- With respect to associations with sexual practice, the results showed a potential impact of having had no anal intercourse and being unsatisfied. The findings are less clear with respect to protected *vs.* unprotected anal intercourse.
- While perceptions of sexual autonomy generally were high across the RDS data collection sites, approximately 1 in 5 of the men in Verona and Bratislava reported not being able to refuse unwanted sexual activity. It has been suggested that not being in control of consensual sexual activity could be used as a proxy for coerced sex. Forced sex is known to increase vulnerability to numerous adverse health outcomes, including drug use, psychological morbidities, HIV, and other STIs (Bartholow et al. 1994). For comparison, prevalence for sexual assault has been estimated to be 2-3% for men, and 12-54% for gay and bisexual men in the US population (Rothman et al. 2011).
- Taken together, the findings on sexual satisfaction and sexual safety suggest that the majority of MSM who participated in the RDS study are currently enjoying safe sexual experiences, free of coercion and violence.
- Future analysis should look at possible correlations between sexual well-being and actual STI/HIV prevalence, as well sexual risk-taking versus adoption of prevention behaviour.
- In order to reduce the percentages of MSM who are unsatisfied with their sex lives, sexual health promotion and HIV/STI prevention programmes targeting MSM should integrate sexual well-being into their objectives. Such programmes should be developed in participation with MSM concerned and should use attractive and appealing communication channels to adequately meet their needs. The role of internet-based interventions including mobile phone applications in this respect should certainly be evaluated (ECDC 2015).
- In conclusion, the three sexual health indicators together (sexual satisfaction, perceived sexual safety, and autonomy) reflect a picture of MSM enjoying safe sexual experiences and being largely in control of their sexual lives. This could represent a promising starting point of future HIV/STI prevention and more comprehensive sexual health promotion.

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Endnotes

[1] Additional options for both items were provided including "does not apply to me" and "I prefer not to answer" but excluded from the current data analysis. For easier representation of the data in this section, a recoded variable is used which re-groups the original options of 'strongly disagree' and 'rather disagree' to 'disagree'. Similarly, 'strongly agree' and 'rather agree' were regrouped to 'agree'.

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5.12 Substance use

Summary

Levels of substance use across all cities were consistently high among the study participants. In most cities, participants who had ever injected drugs were more frequent or at a similar level in older MSM (≥25 years) compared to younger MSM (<25 years).

The prevalence of substance use during last anal intercourse was high. Overall, the most common substance was alcohol, but it is worth noting that a high proportion of MSM use other drugs including illicit substances. The patterns of recreational drug use were highly variable across cities. Also there were no clear patterns by age regarding the frequency of use of different substances in different cities.

The use of party drugs (methamphetamine, MDMA, cocaine, GHB, and mephedrone) was associated with an increased likelihood of not using a condom, especially regarding sex with a non-steady partner.

Introduction

This Section deals with the substance use among the Sialon II study population and its potential consequences on sexual risk behaviours. In addition to the direct health risks related to the use of psychoactive substances, the patterns of use and the impact of substance use on sex risk behaviours are closely connected with HIV transmission risk. Several studies have found higher HIV prevalence among MSM, who reported substance use (Pines et al., 2014; Santos et al., 2014; Tieu et al., 2014; Vanden Berghe, Nöstlinger, and Laga, 2014; Wei, Guadamuz, Lim, Huang, and Koe, 2012; Woolf-King et al., 2013).

HIV is especially common among people who inject drugs (PWID). Injections with needles and syringes contaminated with blood of an infected person while sharing injecting equipment are well established modes of HIV transmission, currently accounting for 16.2% of newly diagnosed HIV cases in the WHO European Region (ECDC/WHO, 2015). Structural risk factors such as economic recession or political transition may decrease investment in preventive measures elevating risk for injection driven transmission among the PWID as demonstrated by recent outbreaks in Greece and Romania (Niculescu et al., 2015; Paraskevis et al., 2013; Sypsa et al., 2015). The patterns of using drugs by injection among MSM differ from the heterosexual population. MSM are more likely to inject amphetamine-type stimulants (e.g. methamphetamine) rather than opiates (Jin, Huriaux, Loughran, Packer, and Raymond, 2014). These drugs may be often used (injected) in the context of sex parties ('slam parties') due to their effect on prolonging sexual activity. There is evidence of an increase in drug use by injection in such situations in some subpopulations of MSM (Kirby and Thornber-Dunwell, 2013).

Moreover, non-injecting drug use has been shown to increase sexual risk behaviours (e.g. Folch et al., 2015). Studies indicate that during sexual encounters under the influence of drugs, MSM are less likely to use condoms (Boone, Cook, and Wilson, 2013; Tieu et al., 2014). Substance use has also been associated with higher cumulative sexual risk (Pines et al., 2014) and this sexual risk increased both with the number of substances used and the frequency of use (Santos et al., 2013).

Findings with regard to specific substances are variable to a certain degree. The evidence for association with risky sexual practices (different definitions) is the strongest for the stimulants use, especially methamphetamines (Santos et al., 2013; Vosburgh, Mansergh, Sullivan, Purcell, 2012; Woolf-King et al., 2013), and linked to sex parties ('sexual marathons') (Semple, Zians, Strathdee, Patterson, 2009). Alcohol use is not directly associated to HIV transmission risk, but was found to predict higher levels of risk behaviours (among HIV-negative or HIV-positive MSM) in some studies (Bruce, Kahana, Harper, Fernández, and ATN, 2013; Tieu et al.,

2014; Woolf-King et al., 2013); although not in others (Fendrich, Avci, Johnson, and Mackesy-Amiti, 2013). More evidence is available for the association of binge alcohol drinking and HIV risk (Vosburgh et al., 2012). Moreover age is possibly an effect modifier for the association with alcohol use, thus older MSM may have an increased risk (Heath, Lanoye, & Maisto, 2012; Mustanski, 2008). Additionally, nitrites (poppers) and erectile dysfunction medications (EDM) are associated with increased odds of unprotected intercourse between sero-discordant sexual partners (Woolf-King et al., 2013) and combination of EDM and methamphetamines may be of especially high risk (Fisher, Reynolds, and Napper, 2010).

Substance use is prevalent among MSM in Europe and elsewhere (The EMIS Network, 2013). This has been explained by higher reporting of depressive symptoms and other mental health problems, driven by both external and internal stigma, resulting in increased vulnerability for HIV and other STIs. These multiple health problems have been conceptualized within syndemic theory (Vanden Berghe et al., 2014), suggesting that the interaction between the different health problems results in an excess of disease burden.

Whilst the majority of research on substance use among MSM comes from the US, relatively little is known about this issue in Europe, especially in Central and Eastern Europe. This Section presents data on the prevalence of injecting drug use (ever) among the MSM in European cities participating in Sialon II. In addition, data are presented on the percentages of participants using substances (e.g. alcohol, EDM, party drugs etc.) at the last episode of anal intercourse. This is essential in order to establish the importance of substance use for HIV/STI transmission risk at the population level.

Results

MSM who have ever injected drugs by age

In both TLS and RDS cities, the Sialon II survey was designed to explore the level of drug use among participants. Specifically, information on a participant's lifetime history of taking illeg al drugs by injection was collected using the following item: 1) "Have you ever injected drugs? (Drugs injected for medical purposes or treatment of an illness do not count.)". Possible responses included 'yes', 'no' and 'I prefer not to answer'.[1]

Overall the percentage of participants who reported ever having injected drugs varied from 1.2% in Bratislava and 2.9% in Sofia to 9.5% in Brussels, and 19.3% in Bucharest. In the majority of the cities, the percentage of older participants (≥25 years) reporting ever having injected drugs was higher or at a similar level as younger participants (<25 years). However, in Brussels, Ljubljana, Lisbon and Warsaw the situation was the opposite with the estimated frequency of injecting history higher in the younger (<25 years) rather than older age group (≥25 years) respectively: 37.4% *vs.* 5.9%; 6.7% *vs.* 4.3%; 12.7% *vs.* 4.7%, and; 10.1% *vs.* 5.3% (Table 5.12.1).

Table 5.12.1 Percentage of MSM who had at least once in their lifetime injected a drug (excluding medical indications), by age group

City	Age	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Sample Size
BARCELONA	**<25**	**1.3%**	0.0%	4.0%	0.89	40
	25+	**3.5%**	0.4%	6.5%	1.57	356
	Total	**3.2%**	0.3%	6.0%	1.66	396
BRATISLAVA	**<25**	**1.6%**	0.0%	3.8%	1.11	114
	25+	**0.9%**	0.0%	2.2%	1.56	276
	Total	**1.2%**	0.1%	2.2%	1.27	390

City	Age	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Sample Size
BRIGHTON	<25	0.9%	0.0%	2.8%	0.80	62
	25+	5.2%	2.7%	7.6%	1.00	327
	Total	4.5%	2.5%	6.4%	0.95	389
BRUSSELS	<25	37.4%	0.0%	81.4%	2.04	10
	25+	5.9%	0.4%	11.4%	1.28	117
	Total	9.5%	1.3%	17.6%	1.59	127
BUCHAREST	<25	11.9%	0.0%	24.7%	1.89	45
	25+	21.4%	6.0%	36.7%	4.33	117
	Total	19.3%	2.3%	36.3%	8.02	164
HAMBURG	<25	0.4%	0.0%	1.1%	0.37	39
	25+	3.7%	0.0%	8.4%	2.43	364
	Total	3.3%	0.0%	7.5%	2.36	403
LISBON	<25	12.7%	0.0%	25.5%	1.26	35
	25+	4.7%	0.4%	9.1%	1.99	370
	Total	5.5%	1.4%	9.7%	1.87	405
LJUBLJANA	<25	6.7%	0.6%	12.7%	1.16	118
	25+	4.3%	0.0%	8.7%	1.90	253
	Total	4.8%	0.3%	9.4%	2.08	371
SOFIA	<25	2.4%	0.0%	5.6%	1.06	111
	25+	2.7%	0.6%	4.9%	1.12	269
	Total	2.7%	0.2%	5.1%	1.49	380
STOCKHOLM	<25	7.1%	0.9%	13.2%	1.10	58
	25+	6.7%	1.4%	11.9%	1.61	249
	Total	6.8%	3.2%	10.3%	1.27	307
VERONA	<25	0.0%	-	-	-	104
	25+	3.1%	0.0%	8.6%	9.09	280
	Total	2.1%	0.0%	7.7%	18.20	386
VILNIUS	<25	2.8%	0.1%	5.5%	0.69	82
	25+	3.9%	1.1%	6.7%	1.54	234
	Total	3.6%	1.3%	5.8%	1.49	316
WARSAW	<25	10.1%	0.0%	20.3%	1.82	85
	25+	5.3%	0.0%	11.4%	2.35	306
	Total	6.7%	0.0%	13.5%	2.76	391

MSM who have ever injected drugs by HIV status [2]

A history of drug injection was generally more common among HIV-positive participants with the exception of Sofia, Ljubljana, and Bratislava where no HIV-positive MSM reported to ever having injected drugs (Table 5.12.2). In several cities, including the three aforementioned cities, the sample size for HIV-positive MSM was small leading to unstable estimates for the percentage of injectors in the stratified analysis; thus findings must be interpreted cautiously.

Among cities, where a sample size of above 30 HIV-positive MSM was available, the highest percentage of ever injectors among HIV-positive participants was observed in Bucharest (35.2%), Lisbon (16.5%), and Hamburg (14.1%; see Table 5.12.2). The exceptionally high percentage noted in the Bucharest sample was strongly affected by one chain recruited by the specific seed who was an injecting drug user and also had sex both with men and with women.

Table 5.12.2 Percentage of MSM who had at least once in their lifetime injected a drug (excluding for medical indications), by HIV status

City	HIV status	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Sample Size
BARCELONA	HIV (-)	2.6%	0.3%	5.0%	1.36	334
	HIV (+)	6.3%	0.0%	17.5%	1.73	60
BRATISLAVA	HIV (-)	1.2%	0.1%	2.3%	1.27	371
	HIV (+)	0.0%	-	-	-	19
BRIGHTON	HIV (-)	3.1%	0.3%	5.9%	1.46	316
	HIV (+)	11.4%	2.4%	20.5%	1.19	64
BRUSSELS	HIV (-)	5.7%	0.0%	13.5%	1.91	113
	HIV (+)	43.1%	0.0%	87.4%	1.87	11
BUCHAREST	HIV (-)	16.2%	3.0%	29.4%	4.52	133
	HIV (+)	35.3%	9.1%	61.5%	2.46	31
HAMBURG	HIV (-)	2.6%	0.0%	5.2%	1.60	339
	HIV (+)	14.1%	0.0%	41.8%	2.16	48
LISBON	HIV (-)	2.7%	0.0%	5.6%	1.55	299
	HIV (+)	16.5%	0.0%	33.9%	1.90	69
LJUBLJANA	HIV (-)	5.0%	0.0%	10.3%	2.18	311
	HIV (+)	0.0%	0.0%	0.0%	0.00	15
SOFIA	HIV (-)	3.0%	0.4%	5.7%	1.39	313
	HIV (+)	0.0%	0.0%	0.0%	0.00	17
STOCKHOLM	HIV (-)	5.9%	1.9%	9.9%	1.48	286
	HIV (+)	47.5%	0.0%	100.0%	1.46	15
VERONA	HIV (-)	1.3%	0.0%	6.9%	27.40	354
	HIV (+)	9.7%	0.0%	26.3%	3.02	32
VILNIUS	HIV (-)	3.6%	1.3%	5.8%	1.46	308
	HIV (+)	3.9%	0.0%	11.4%	0.35	8
WARSAW	HIV (-)	6.4%	0.0%	14.5%	3.17	338
	HIV (+)	10.7%	0.8%	20.6%	0.87	52

MSM who have ever injected drugs by hepatitis status (RDS only)

In RDS cities, laboratory data from testing were also available for viral hepatitis B and C. History of injecting drug use was more common among participants with evidence of past or ongoing infection with HBV or HCV in Bucharest (30.3% in HBc-Ab positive MSM vs 13.3% in the negatives and 87.2% in HCV-Ab positive vs 1.3% in the negative) and Verona (11.6% in HBc-Ab positive MSM vs 0.2% in the negatives and 38.8% in HCV-Ab positive vs

0.2% in the negative), but not in Bratislava (none in HBc-Ab positive MSM vs 1.2% in the negatives and none in HCV-Ab positive vs 1.2% in the negative) and Vilnius (none in HBc-Ab positive MSM vs 3.9% in the negatives). In Bratislava and Vilnius, hepatitis B was less common and there were almost no (Bratislava) or no (Vilnius) MSM diagnosed with HCV-Ab (Table 5.12.3).

Table 5.12.3 Percentage of MSM who had at least once in their lifetime injected a drug (excluding for medical indications), by hepatitis B and C status

City	Hepatitis status	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Sample Size
Hepatitis B: HbC-Ab						
BRATISLAVA	HBc-Ab (-)	**1.2%**	0.1%	2.3%	1.37	372
	HBc-Ab (+)	**0.0%**	-	-	-	18
BUCHAREST	HBc-Ab (-)	**13.6%**	2.4%	24.7%	2.82	100
	HBc-Ab (+)	**30.3%**	11.8%	48.7%	2.65	62
VERONA	HBc-Ab (-)	**0.2%**	0.0%	0.4%	0.27	326
	HBc-Ab (+)	**11.6%**	0.0%	24.1%	2.78	60
VILNIUS	HBc-Ab (-)	**3.9%**	1.5%	6.3%	1.43	293
	HBc-Ab (+)	**0.0%**	-	-	-	23
Hepatitis C: HCV-Ab						
BRATISLAVA	HCV-Ab (-)	**1.2%**	0.1%	2.3%	1.32	386
	HCV-Ab (+)	**0.0%**	-	-	-	4
BUCHAREST	HCV-Ab (-)	**1.3%**	0.4%	2.2%	0.19	122
	HCV-Ab (+)	**87.2%**	74.0%	100.4%	1.66	40
VERONA	HCV-Ab (-)	**0.2%**	0.0%	0.5%	0.61	373
	HCV-Ab (+)	**38.8%**	6.1%	71.5%	1.69	13
VILNIUS	HCV-Ab (-)	**3.6%**	1.3%	5.9%	1.51	316
	HCV-Ab (+)	**-**	-	-	-	0

Substance use during the last anal intercourse with a male partner [3]

For TLS and RDS participants who indicated that they had previously had anal intercourse (AI) with a man, participants were asked to respond to one item assessing substance use during this last AI with a male partner: "Before or during your last anal sexual intercourse, did you use the following?" Participants could respond, 'yes', 'no', 'I prefer not to answer' for each item of the following list: alcohol; poppers; ecstasy; Viagra/Camagra/Ciallis (erectile dysfunction medications or EDMs); hashish/marijuana; cocaine; amphetamine; GHB (gamma-hdroxybutyric acid); or other ('specify').

With reference to Table 5.12.4, alcohol was the most frequent substance used during the last AI with between 24.6% and 66.8% of participants reporting its use across TLS and RDS cities. There was a tendency for younger participants (<25 years) to use alcohol more than older participants (≥25 years), but not in all cities and the differences were small.

In terms of EMD, reported use was less frequent than alcohol varying from 1.7% in Sofia and 1.8% in Ljubljana to 14.5% in Brighton and 16.1% in Brussels (Table 5.12.4). These percentages were consistently higher in older participants (≥25 years). Among these older participants, the median value for EMD use was 5.4%, as compared to 1.4% for younger participants (<25 years). 12.4).

Table 5.12.4 Percentage of MSM who used alcohol and who used EDM (e.g. Viagra) before or during the last anal sex, by age

City	Age	Alcohol					EDM				
		Point Esti-mate	95% Lower Bound	95% Upper Bound	Est. Design Effect	Sample Size	Point Esti-mate	95% Lower Bound	95% Upper Bound	Est. Design Effect	Sample Size
BARCELONA	<25	**49.0%**	31.3%	66.6%	1.36	42	**6.8%**	0.0%	19.6%	1.96	42
	25+	**32.8%**	24.9%	40.7%	1.56	347	**7.4%**	3.2%	11.6%	1.48	347
	Total	**35.2%**	28.1%	42.4%	1.50	389	**7.3%**	3.2%	11.4%	1.59	389
BRATISLAVA	<25	**41.6%**	31.0%	52.2%	1.89	117	**1.1%**	0.2%	2.1%	0.35	117
	25+	**35.0%**	27.7%	42.3%	2.26	276	**7.0%**	3.0%	10.9%	2.34	278
	Total	**37.0%**	31.3%	42.7%	1.93	393	**5.2%**	2.5%	8.0%	2.16	395
BRIGHTON	<25	**57.4%**	39.7%	75.2%	1.36	61	**14.9%**	0.0%	32.2%	1.85	61
	25+	**43.7%**	31.6%	55.7%	2.20	324	**14.4%**	7.9%	21.0%	1.68	325
	Total	**45.6%**	35.7%	55.5%	1.99	385	**14.5%**	9.2%	19.8%	1.50	386
BRUSSELS	<25	**42.2%**	17.0%	67.3%	1.96	48	**3.7%**	0.0%	9.3%	1.16	48
	25+	**60.0%**	50.5%	69.6%	1.75	321	**18.3%**	3.9%	32.7%	3.36	324
	Total	**57.3%**	48.0%	66.6%	1.84	369	**16.1%**	3.6%	28.6%	3.35	372
BUCHAREST	<25	**20.7%**	8.6%	32.7%	1.09	46	**0.0%**	-	-	-	41
	25+	**47.6%**	35.1%	60.1%	2.06	124	**5.0%**	0.6%	9.4%	1.19	111
	Total	**42.0%**	32.0%	52.0%	1.89	172	**4.0%**	-0.4%	8.3%	2.01	154
HAMBURG	<25	**37.9%**	12.7%	63.1%	1.66	36	**2.3%**	0.0%	6.7%	0.93	36
	25+	**43.1%**	35.1%	51.2%	1.53	346	**4.1%**	0.0%	8.7%	2.18	346
	Total	**42.6%**	36.2%	48.9%	1.28	382	**3.9%**	0.0%	8.1%	2.18	382
LISBON	<25	**35.1%**	14.7%	55.5%	1.38	33	**0.0%**	0.0%	0.0%	0.00	33
	25+	**30.0%**	20.0%	40.1%	2.12	365	**5.4%**	2.2%	8.6%	1.37	364
	Total	**30.5%**	22.2%	38.9%	1.85	398	**4.9%**	1.7%	8.0%	1.49	397
LJUBLJANA	<25	**52.3%**	42.3%	62.2%	0.90	114	**0.4%**	0.0%	1.1%	0.54	114
	25+	**45.2%**	31.1%	59.2%	2.44	259	**2.2%**	0.4%	4.0%	1.06	259
	Total	**46.7%**	35.6%	57.8%	2.19	373	**1.8%**	0.4%	3.2%	1.05	373
SOFIA	<25	**60.1%**	41.2%	79.0%	1.99	115	**1.5%**	0.0%	4.3%	1.17	113
	25+	**69.1%**	63.8%	74.4%	1.02	296	**1.8%**	0.0%	5.0%	2.18	294
	Total	**66.8%**	59.2%	74.5%	1.68	411	**1.7%**	0.0%	4.8%	2.45	407
STOCKHOLM	<25	**38.3%**	22.8%	53.9%	1.62	73	**1.0%**	0.0%	3.1%	1.03	73
	25+	**37.6%**	27.9%	47.2%	1.58	268	**4.8%**	1.2%	8.5%	1.35	267
	Total	**37.8%**	27.5%	48.0%	1.99	341	**3.7%**	1.2%	6.2%	1.23	340
VERONA	<25	**30.5%**	17.5%	43.5%	2.55	104	**1.4%**	-1.3%	4.1%	1.72	104
	25+	**22.0%**	15.4%	28.7%	2.36	289	**5.1%**	1.1%	9.2%	3.11	291
	Total	**24.6%**	18.1%	31.0%	2.82	395	**4.0%**	1.0%	7.0%	2.91	398
VILNIUS	<25	**55.2%**	42.3%	68.0%	1.68	81	**0.0%**	-	-	-	81
	25+	**49.6%**	42.2%	57.0%	1.61	236	**5.8%**	2.5%	9.1%	1.48	237
	Total	**51.0%**	44.8%	57.2%	1.51	317	**4.4%**	1.9%	6.8%	1.39	318

City	Age	Alcohol					EDM				
		Point Esti-mate	95% Lower Bound	95% Upper Bound	Est. Design Effect	Sample Size	Point Esti-mate	95% Lower Bound	95% Upper Bound	Est. Design Effect	Sample Size
WARSAW	<25	**49.7%**	33.2%	66.2%	1.81	88	**2.4%**	0.0%	5.5%	1.11	88
	25+	**39.3%**	33.3%	45.3%	1.02	295	**7.4%**	1.6%	13.1%	1.85	297
	Total	**42.3%**	37.4%	47.3%	1.00	383	**5.9%**	2.0%	9.8%	1.65	385

Recreational drug use before or during the last anal intercourse [4]

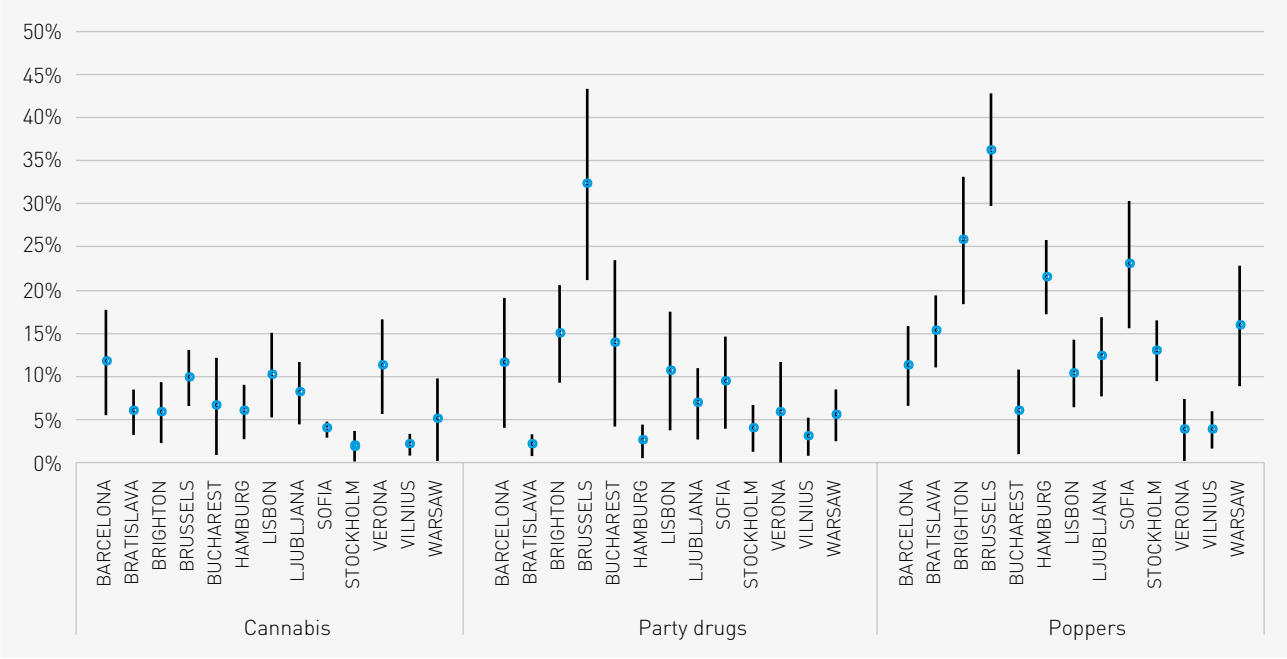
Recreational drugs included: poppers, MDMA, cannabinoids, cocaine, amphetamine, ketamine/GHB, and mephedrone and they were further sub-classified into nitrites (poppers), cannabinoids (marihuana, hashish) and party drugs (as defined by the EMIS study: MDMA, cocaine, amphetamine, ketamine/GHB, and mephedrone (23)). With regards to Table 5.12.5, recreational drug use before or during the last AI varied across the cities. Estimates ranged from 7.5% of participants reporting use in Vilnius to over one third of respondents from Brighton, Brussels and Sofia. In the majority of cities, recreational drug use was more common among older participants (>25 years) compared to younger participants (<25 years). The most commonly used recreational drug were nitrites (poppers) with a median value of 13.0% across cities. Variability was however substantial ranging from 3.8% in Verona and Vilnius to 25.8% in Brighton and 36.2% in Brussels. Cannabis use was less variable and in most cities ranged between 5% and 10% (Figure 5.12.1). Party drugs were used by 2.0% to 15% of MSM from different cities with an outlier of 32.3% in Brussels.

Table 5.12.5 Percentage of MSM who used a recreational drug before or during the last anal sex, by age

City	Age	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Sample Size
BARCELONA	<25	**13.3%**	0.0%	31.5%	2.08	42
	25+	**26.2%**	17.9%	34.6%	1.76	348
	Total	**24.3%**	14.0%	34.7%	2.42	390
BRATISLAVA	<25	**21.3%**	12.0%	30.6%	1.94	110
	25+	**19.5%**	13.4%	25.6%	2.19	264
	Total	**20.0%**	15.0%	25.0%	2.02	374
BRIGHTON	<25	**32.4%**	9.7%	55.0%	1.84	61
	25+	**35.0%**	26.3%	43.7%	1.66	325
	Total	**34.6%**	24.7%	44.5%	2.08	386
BRUSSELS	<25	**20.7%**	0.0%	42.1%	2.03	48
	25+	**53.7%**	45.3%	62.2%	1.53	323
	Total	**48.8%**	39.4%	58.2%	1.85	371
BUCHAREST	<25	**11.7%**	0.7%	22.6%	1.24	40
	25+	**21.4%**	11.2%	31.6%	1.84	113
	Total	**19.5%**	10.2%	28.8%	2.23	154
HAMBURG	<25	**14.3%**	0.0%	34.1%	1.80	36
	25+	**27.6%**	22.1%	33.0%	1.14	345
	Total	**26.2%**	20.8%	31.5%	1.21	381

City	Age	Point Estimate	95% Lower Bound	95% Upper Bound	Estimated Design Effect	Sample Size
LISBON	<25	45.0%	19.1%	70.9%	1.68	33
	25+	22.0%	13.6%	30.4%	1.96	364
	Total	24.3%	17.0%	31.7%	1.74	397
LJUBLJANA	<25	17.3%	9.0%	25.6%	0.99	113
	25+	22.6%	17.4%	27.9%	1.08	258
	Total	21.5%	16.7%	26.3%	1.14	371
SOFIA	<25	47.4%	35.7%	59.1%	1.20	114
	25+	29.4%	15.6%	43.3%	2.71	295
	Total	33.9%	22.5%	45.3%	2.48	409
STOCKHOLM	<25	9.5%	2.4%	16.6%	1.23	73
	25+	17.2%	11.4%	23.0%	1.22	267
	Total	15.0%	10.3%	19.6%	1.22	340
VERONA	<25	21.9%	10.0%	33.9%	2.52	99
	25+	14.0%	5.8%	22.3%	4.98	281
	Total	16.7%	8.0%	25.4%	6.51	383
VILNIUS	<25	7.1%	1.9%	12.3%	1.05	81
	25+	7.7%	3.5%	11.8%	1.77	233
	Total	7.5%	4.2%	10.8%	1.54	314
WARSAW	<25	15.4%	5.9%	24.9%	1.44	88
	25+	20.0%	10.2%	29.7%	2.03	296
	Total	18.6%	12.9%	24.4%	1.47	384

Figure 5.12.1 Percentage (95% CI) of MSM using cannabis, poppers or party drugs, by city

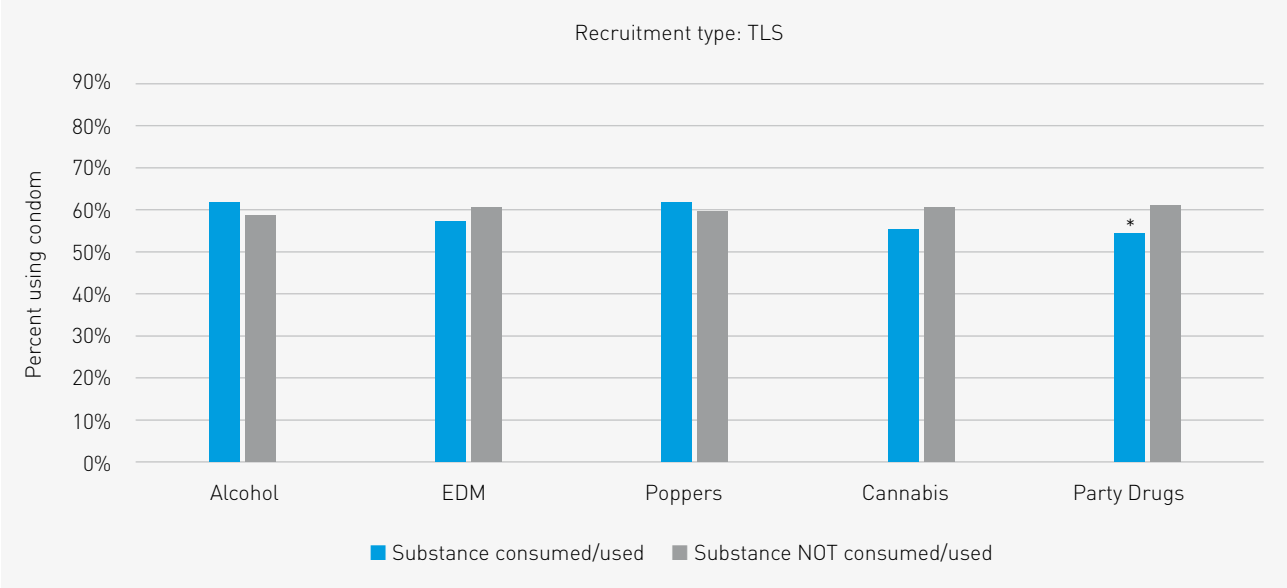


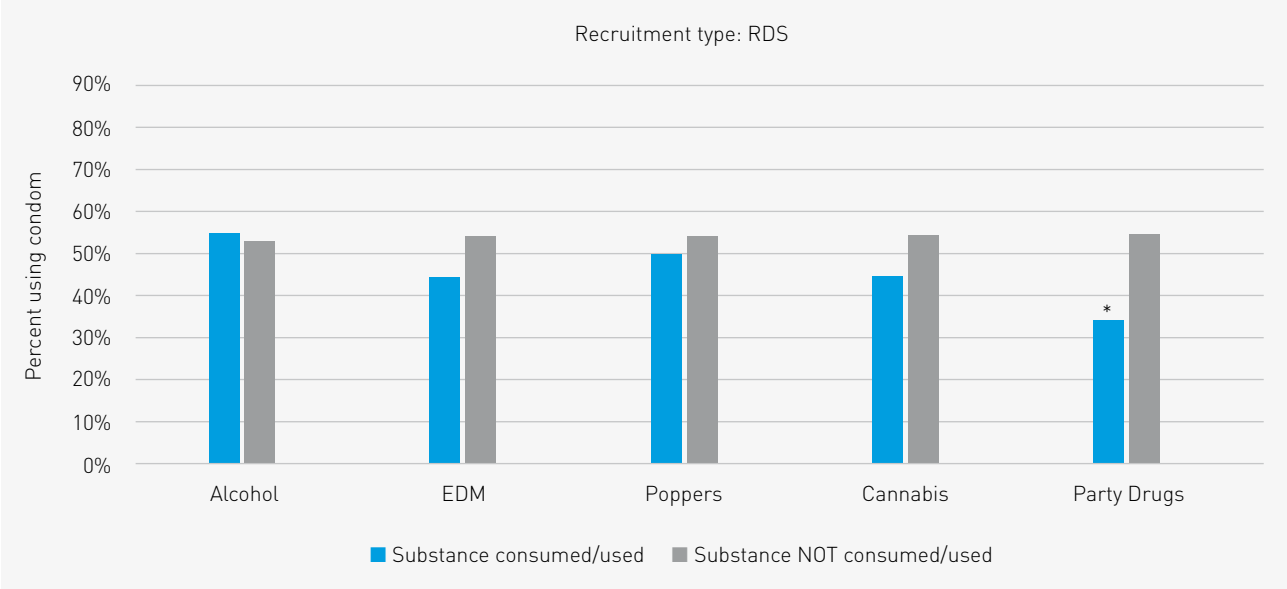
Associations of substance use and condom use during the last anal intercourse [5]

In both TLS and RDS cities, the use of party drugs (as defined by the EMIS study to include: MDMA, cocaine, amphetamine, ketamine/GHB, and mephedrone (23)) was associated with an increased risk of unprotected intercourse.

In TLS cities for example, the percentage of participants using a condom during the last AI was 60.7% among those *not* using party drugs *vs.* 54.1% among those *using* drugs. Similarly differences in percentages were evident in RDS cities with 54.6% *vs.* 34.2% respectively (Figure 5.12.2). Important differences existed between the situations in which the intercourse was with a steady or a non-steady partner. Whilst substance use did not appear to impact on condom use in steady relationships, it was associated with unprotected intercourse in non-steady partners with a tendency of decreased condom use when using a substance. However, even in case of unprotected intercourse with non-steady partners, the association was significant only for the party drugs: 78.9% vs 64.7% in the TLS and 69.2% vs 31.6% in the RDS and for the EDM in TLS settings.

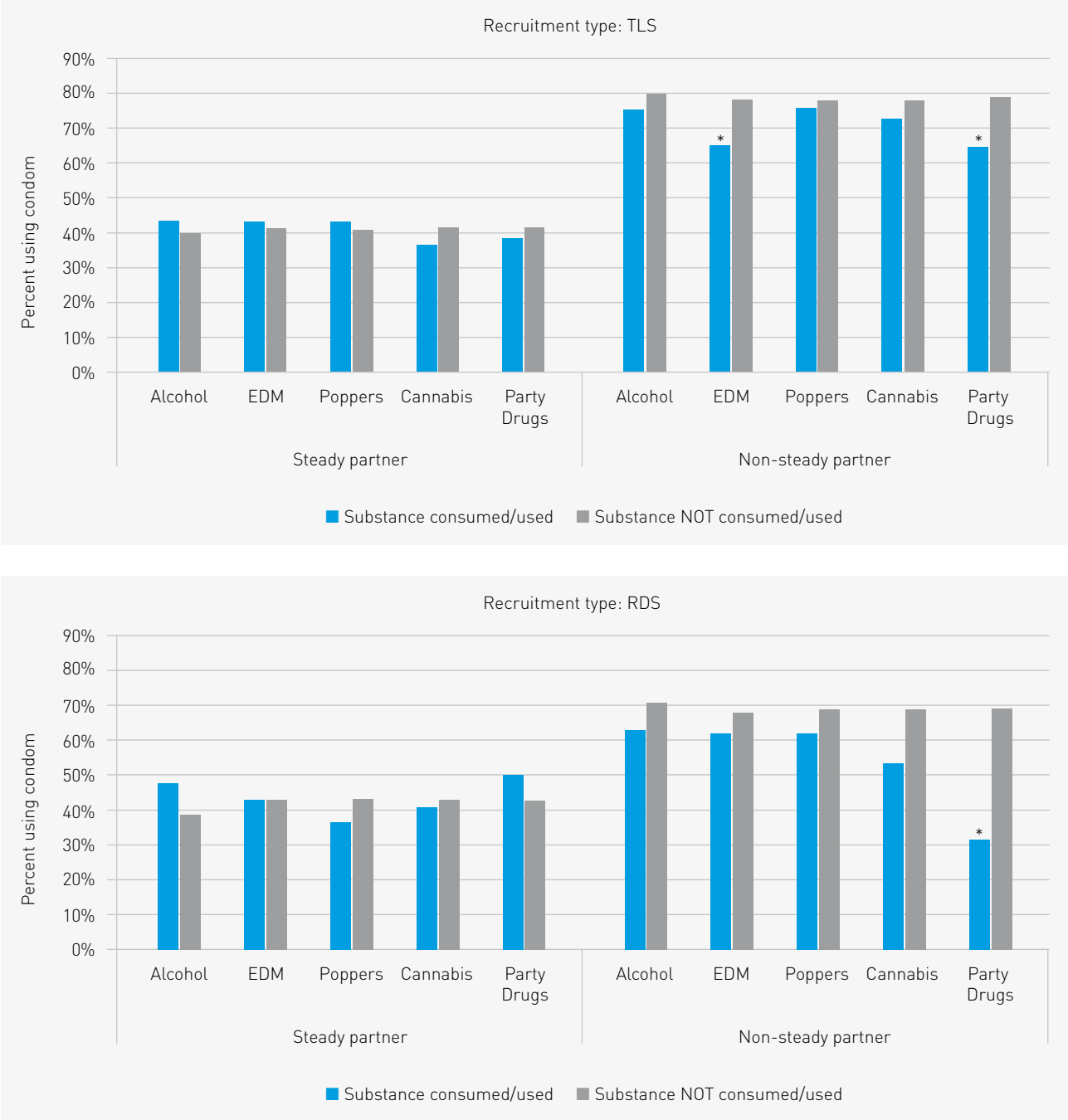
Figure 5.12.2 Percentage of MSM using a condom during last anal sex, by whether substances were used/consumed or not (aggregated, unweighted analysis, stratified by sampling method)





* denotes significantly different

Figure 5.12.3 Percentage of MSM using a condom during last anal sex, by consuming/using or not substances and by partner type (aggregated, unweighted analysis, stratified by sampling method)



* denotes significantly different

Summary and conclusions

- Levels of substance use across all cities were consistently high among study participants. Overall 2.9% - 9.4% of MSM reported ever having injected drugs. The estimates of injecting history tend to be higher for MSM than the available estimates for general population in the respective countries. In the data collected by the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) national estimates for the prevalence of injecting drug use in Europe vary from 0.2 %to 5.9%. However, the methods used by studies reported to EMCDDA may differ for different countries and for different populations meaning it is difficult to compare with the findings from Sialon II (EMCDDA, 2014).

- In most cities, participants who had ever injected drugs were more frequent or at a similar level in older MSM (≥25 years) compared to younger MSM (<25 years). This is consistent with accumulation of life-time experiences (maturation effect). The increase in the older age group is modest in some countries possibly reflecting the patterns of experimental drug use. Experimenting with drugs is more common among teenagers and young adults than among older age groups. Older participants (≥25 years) are therefore more likely to report such experiences which took place earlier in life. In six cities (Brussels, Bratislava, Lisbon, Ljubljana, Stockholm, and Warsaw) the patterns were the opposite with much more frequent estimated history of injecting in the younger age group. However, these data should be interpreted cautiously due to small sample sizes. These high percentages among younger participants (11.9% in Bucharest, 12.7% in Lisbon, 6.7% in Ljubljana, 7.1% in Stockholm and 10.1%, in Warsaw) should draw attention to possible increase in injecting incidence among MSM in these cities.
- The history of injecting drug use was more frequent among HIV, HBc-Ab and especially HCV-Ab positive participants. It would be essential in further analysis to clarify if injecting drugs, even if only experimental or recreationally may have consequences on the spread of infections among MSM.
- The prevalence of substance use during last anal intercourse was high. Overall, the most common substance was alcohol, but it is worth noticing that a high percentage of MSM use other drugs including illicit substances. The patterns of recreational drug use were highly variable across cities. Also there were no clear patterns by age regarding the frequency of use of different substances in different cities.
- Use of party drugs (methamphetamine, MDMA, cocaine, GHB, and mephedrone) was associated with an increased likelihood of not using a condom, especially regarding sex with a non-steady partner. Previous research indicates that stimulant use (e.g. methamphetamine use) is associated with 2-fold to 6-fold increase in the odds of a detectable viral load (Blumenthal et al., 2014; Carrico, Woolf-King, Neilands, Dilworth, and Johnson, 2014). The detectable viral load implies a higher chance of transmission of HIV in the case of unprotected intercourse with a negative partner. Therefore party drug users may significantly contribute to onward transmission (Blumenthal et al., 2014).
- Substance use can be seen as part of so-called syndemic conditions including depression, substance use, violence, sexual stigma, and homelessness. Such syndemic conditions tend to act synergistically to increase the HIV risk and a multi-faceted approach to mitigate this risk has been suggested previously (Santos et al., 2014; Vanden Berghe et al., 2014).

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Endnotes

[1] To calculate lifetime history of taking illicit drugs by injection, the numerator included the number of participants who report every having used drugs by injection (i.e. those who answered 'Yes' to Question 35; excluding drug use for medical purposes. In the denominator, the number of participants of MSM who provided information on whether they had ever used drugs by injection (answered 'Yes' or 'No' to Question 35).

[2] To calculate estimates stratified by HIV status, the status was established based on the laboratory results in biological material (oral fluid or serum) collected in Sialon II.

[3] To calculate the percentage of participants who used a specific substance (e.g. alcohol, nitrites, ecstasy etc.), the numerators for these indicators were the number of MSM who reported using the substance during the last anal intercourse with another man (answered 'Yes' to the respective item in Question 30). The denominators were the number of MSM who did not refuse to answer whether they used a substance during the last anal sex with another man (answered 'Yes', 'No' or no answer). Participants who indicated that they had never had anal intercourse (response to Question 26) were excluded. Importantly, it was necessary to impute missing values with 'No' as many participants interpreted Question 30 as a 'checklist' type question and not as a series of 'Yes/No' questions.

[4] To calculate the percentage of participants who used a recreational drug before or during the last anal intercourse, an indicator was constructed using the imputation described in [3]. Recreational drugs included: poppers, MDMA, cannabinoids, cocaine, amphetamine, ketamine/GHB, mephedrone. The numerator was the number of men who used any of the recreational drugs (answered 'Yes' to at least one of the respective items in Question 30). The denominator was the number of MSM who either reported having used any of the recreational drugs (the numerator) or did not refuse *any* of the items referring to the recreational drugs (answered 'No' or no answer). As in [3] participants who indicated that they had never had anal intercourse (response to Question 26) were excluded. Finally to calculate the percentage of participant who used a party drug we used the definition of party drug as defined by EMIS study (23). Thus, party drugs were defined as a subset of recreational drugs and included: MDMA, cocaine, amphetamine, ketamine/GHB, mephedrone. The indicator was calculated in an analogous way to the percentage of participants who used a recreational drug.

[5] To explore associations of substance use and condom use during the last anal intercourse, data were combined and used without weights, as a convenience sample to increase sample size for the description of associations.

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6. Discussion

In this Chapter, an overview of the main results from the Sialon II survey is presented and discussed. The discussion considers both methodological issues as well as main insights from the study results. Finally, some comparisons between the former Sialon I and Sialon II project surveys are outlined.

Methodology

The methodology adopted for the Sialon II project incorporated the main approaches for monitoring and controlling the HIV epidemic in line with the indications in the literature and relevant international reports from ECDC, UNAIDS and WHO. A sound and structured surveillance system was elaborated accordingly, including the use of a common set of indicators. Ad-hoc prevention campaigns targeting MSM and focusing on testing promotion were also foreseen as an integral component of the project.

Previous surveys have collected behavioural data using internet based recruitment methods but the concomitant collection of biological samples was not foreseen. Furthermore, where bio-behavioural surveys have been carried out, different indicators and methodologies have been adopted, rendering any comparison of the results difficult.

In terms of sampling methods, the implementation of a bio-behavioural survey using different sampling methods, namely Time-Location Sampling (TLS) and Respondent-Driven Sampling (RDS), has greatly improved the quality of the surveillance in terms of the validity and reliability of the data and has contributed to capacity building across participating countries. In addition, the use of these two different sampling methods – tailored according to both local needs and gay scene characteristics of each participating city – proved to be effective in different social contexts and across the different study sites. These different methods allowed researchers to enrol heterogeneous populations and to collect reliable information on behaviour patterns, prevention needs and sexual health in the MSM population, triangulating the behavioural data (risk behaviours, socio-ecological or contextual factors) and the biological information.

The questionnaire, incorporating GARPR and ECDC indicators, developed and validated with the involvement of representatives of the gay communities of all cities, represented a unique tool for collecting data according to a standardised approach. Such indicators were very useful for conducting this type of bio-behavioural survey

targeting – in this case – MSM population and the results have provided countries with a clear and direct marker on the status of the epidemic in the MSM populations across cities.

Given that the survey collected biological samples and linked behavioural information across 13 different European countries, very specific and clear ethical and governance procedures were required and adopted in order to comply with all local, national, and European standards. Survey protocols and procedures were harmonised and tailored in order to minimise the risks of mistakes (including potential diagnostic mistakes) and ensuring the principle of privacy and confidentiality for all participants during the entire survey process. For this purpose, a barcode system was developed with the twofold objective of ensuring anonymity of the participants while at the same time ensuring the anonymous traceability of each participant's result.

In addition, the Sialon II research protocols were also approved by the WHO Research Project Review Panel (RP2-WHO) and by the Research Ethics Review Committee (WHO-ERC) in February 2013, guaranteeing excellence both from a scientific and ethical point of view.

In terms of methodology, the Sialon II project has contributed to the harmonisation process of surveillance methods across participating countries initiated by ECDC and other International Agencies and has contributed to a more effective public health response at country and European level. The comparable data on behavioural and epidemiological indicators for MSM communities (ECDC and GARPR indicators) presented in this report represents an opportunity for local, European, and international Institutions, that can use the methodology applied in Sialon II to implement future surveys across different countries.

Survey Results

The samples enrolled in the study cities present remarkable differences in the age composition and educational levels, which do not necessarily reflect the real difference in the cities' MSM populations and which could potentially be attributed to the differences in the social segments of the MSM population reached by the Sialon II study. Also the migration patterns present marked differences which, together with the tourism patterns, should be taken into account in interpreting the estimates across the cities. In some cities the migrant population represents a significant percentage (>20%) of the enrolled MSM compared to others where it appears to be almost absent. In line with other survey results, some cities manifest an important attraction factor for the MSM population probably due to the vast variety of gay venues on offer. These aspects have important repercussions on the prevention policy and programmes that should be tailored to reach all the segments of the MSM population.

The level of "outness" and the perceived "homonegativity" differed substantially between the study areas. In Eastern European cities where homosexuality has been decriminalised only recently, men were less likely to be out regarding their sexual attraction to men. In this type of scenario, the use of the RDS method seemed to be very efficient in reaching more hidden MSM populations particularly for never tested MSM.

There are important differences between cities also when comparing the number of men reached by prevention programmes (GARPR indicator 1.11). Even if most of the men in the TLS and RDS surveys knew where to go to get an HIV test, the percentage of men that had been given condoms during the last 12 months varied between the cities from less than half to almost all men. This is, therefore, an area where there seems to be room for improvement.

Differences between the cities regarding the extent of outreach activities and routines for providing condoms in health care settings and the type of venues sampled in the study vary considerably. It would appear, therefore, that the local context should be taken into consideration when developing strategies for condom distribution.

Older participants (>25 years) tested more recently and more frequently than younger participants (<25 years). This might indicate that a larger group of young MSM are potentially not aware of their HIV status. The majority of the participants reported having tested within the last two years (2012 -2014); this was particularly evident in younger participants (<25 years).

Anal intercourse without a condom in the previous six months was reported by approximately half of the

study participants, slightly more often by men living in the Central European study cities. In addition unprotected anal intercourse was reported more frequently with steady partners compared to non-steady partners.

The association between age, condom use and partner type was not consistent across the study cities. In most cities, condom use with a steady partner was lower for younger men than for men 25 years and older, but sample sizes for younger men living in steady relationships were small for several cities.

The effect of knowledge of HIV status on condom use differed by partner type: reported condom use was lowest among HIV negative respondents having anal sex with a steady partner and highest among HIV negative respondents having anal sex with a non-steady partner. Among respondents aware of being infected with HIV, condom use with steady partners was higher than among HIV negative men, however, condom use with non-steady partners was lower. Men unaware of being infected with HIV reported the lowest condom use with non-steady partners. The knowledge of HIV status had a greater impact on unprotected vaginal or anal intercourse with female partners. Among men having sex with women, episodes of unprotected vaginal sex was high (almost a half) which would suggest the need to target this subpopulation group, particularly in Eastern European countries.

The percentage of study participants reporting more than one UAI partner in the previous six months varied across cities with high frequency reported in almost all Eastern European cities. High numbers of partners with whom condomless AI was practiced were reported most frequently by study participants infected with HIV, regardless of whether they knew to be HIV infected or not. However, almost more than a half of the individuals unaware of being infected with HIV reported only one or no UAI partner in the previous six months.

Reporting a STI diagnosis in the previous 12 months was also associated with a higher number of sex partners in the previous six months: more than one third of all STIs reported were diagnosed in men reporting more than 10 partners, while among men without STIs less the one MSM over five reported more than 10 partners.

As previously discussed, most MSM reported only having sex with male partners in the past six months. However, a minority of participants also reported sex with female partners (steady and non-steady) in the past six months. The percentage of behaviourally bi-sexual men varies considerably across cities but seems to be present in all study sites. This subgroup of MSM reported a high number of episodes of unprotected sex with women leading to a possible bridging effect for the HIV transmission. In terms of policy, these findings suggest that there may be important HIV prevention opportunities to tailor programmes in order to reach this subpopulation of MSM particularly in those cases where MSM do not disclose their behavioural bi-sexuality to either their male or female partner.

The last episode of anal sex is an important indicator suggested to estimate precisely the sexual behaviour and the associated risk. This was reported almost equally as often with a steady and a non-steady partner. Sexual roles during this last anal intercourse were found to be distributed equally between insertive, receptive, and both, with only minor variations between cities. The HIV serostatus concordance with the last steady anal sex partner was almost always assumed and also the HIV seroconcordance with non-steady anal sex partners was rarely established. Not knowing one's own HIV status or the steady partner's HIV status was most frequent in Central European cities. Condomless AI was considerably more frequent when the last anal sex partner was a steady partner compared to a non-steady partner.

The majority of study participants in the RDS samples reported low levels of involvement in commercial sex with the exception of Bucharest. The majority of those who had been paid for sex reported that they had used a condom during anal sex the last time they were paid. The commercial sex with female partners was infrequent. Again the highest percentage was found in Bucharest.

In terms of HIV prevalence, data suggested that this varies between 2% and 20%, with higher rates among individuals older than 25 years of age. A relevant proportion (ranging between 12% and 88%) of participants were unaware of being HIV-positive. This would suggest that it would be opportune to routinely offer to MSM periodical serological testing for HIV, syphilis, HBV, and HCV. In terms of viral load and treatment, consistent differences were reported across participating cities. In general, unsatisfactory treatment coverage and treatment adherence were reported in the Eastern European cities. Among HIV positive MSM under treatment (ART), the percentage of participants with undetectable viral load was relatively high, suggesting good adherence and

appropriate quality of treatment, whilst it should be noted that the continuum of care is quite different across cities. The lack or delay in diagnosis is a crucial factor in all areas. In several cities, the treatment coverage may be less than optimal even among the individuals who know they are HIV positive indicating potential challenges in linkage to care and continuity in care. This underlines the possible inequalities in access to preventive and medical services, which should be tackled in order to combat HIV in Europe.

The level of satisfaction of the MSM sexual life was generally high with three quarters or more of all participants generally reported to be satisfied. The percentage of MSM who reported being unsatisfied with their sex lives was generally lower than 25% across all cities. Such levels are markedly lower when compared to findings of the other studies. This could reflect a difference in wording as well as the influence of different data collection methods, for instance in settings where people socialise for seeking sex.

Levels of substance use across all cities were consistently high among the study participants. In most cities, participants who had ever injected drugs were more frequent or at a similar level in older MSM (>25 years) compared to younger MSM (<25 years).

The prevalence of substance use during last anal intercourse was high. Overall, the most common substance was alcohol, but it is worth noticing that a high proportion of MSM use other drugs including illicit substances. The patterns of recreational drug use were highly variable across cities. Also there were no clear patterns by age regarding the frequency of use of different substances in different cities.

The use of party drugs (methamphetamine, MDMA, cocaine, GHB, and mephedrone) was associated with an increased likelihood of not using a condom, especially regarding sex with a non-steady partner. Substance use can be seen as part of so-called syndemic conditions including depression, substance use, violence, sexual stigma, and homelessness.

In conclusion, when considering the main relevant findings, it should be underlined that a low level of testing uptake is reported in the survey. The high number of MSM who were tested for the first time in the context of this survey, in particular in the Eastern European survey cities and the high estimates of HIV positive participants unaware of their real serum-status, seem to suggest critical conditions in terms of future increase of the HIV epidemic. The situation seems to be particularly alarming in Eastern European cities, where a low level of condom use is reported, as well as a high level of perceived stigma.

Comparisons between Sialon I and Sialon II

As already mentioned, the Sialon II project follows on from the Sialon project which was funded under the 2003-2008 Public Health Programme (work plan 2007). It is not possible to compare precisely the findings from a statistical point of view, as in Sialon I only the TLS method was adopted whereas in Sialon II both the TLS and RDS methods were adopted. In addition, in the former Sialon un-weighted prevalence and estimates were produced, whereas in Sialon II the use of a weighting system (both in TLS and in RDS) was adopted. Furthermore, the partner network was more extensive in the Sialon II project. However, some general comparisons can be made as follows.

Estimates on HIV prevalence seem to be in line with previous project. Similar prevalence estimates were reported in Sialon I for four out of five cities that were included also in Sialon II i.e. Barcelona, Bratislava, Ljubljana, and Verona. In Barcelona and Ljubljana, the same sampling method was used and similar HIV prevalence estimates were observed when comparing Sialon II with Sialon I: 14% vs. 17% in Barcelona, 4% vs. 5% in Ljubljana, respectively. For Bratislava and Verona the sampling method was different in Sialon II compared to Sialon I. Nevertheless, the HIV prevalence estimates were similar: in Bratislava 4% vs. 6%, in Verona 10% vs. 12%, respectively. Only in Bucharest, a higher prevalence was observed in Sialon II, which, as mentioned above, may be attributed to the high proportion of injecting drug user MSM included in the sample (Mirandola, 2009).

Data on behavioural component (risky behaviours), testing and prevention programmes seem to confirm a critical situation especially in Eastern Europe, where the potential for further HIV transmission was evident in the former Sialon and it is confirmed – if not further corroborated – in Sialon II findings.

In general, the use of TLS (adopted in the former Sialon and in the majority of the participating cities in Sialon II) as a sampling method confirmed to be feasible and efficient in cities where the gay scene is characterised by an adequate number of gay venues.

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7. Conclusions and recommendations

Overview

As a reminder from Chapter Two, the Sialon II project was undertaken within a Europe wide situation of rising HIV infections among MSM in many countries as indicated by both ECDC and the wider scientific literature. To respond effectively to the HIV epidemic(s), meaningful interventions of sufficient scale and intensity that target MSM specifically are required to ensure prevention and health promotion needs are assessed, identified, and responded to. However, what is also required is reliable and comparable data on epidemiological patterns of HIV within and between European countries. This is important to not only understand better the changing nature and shape of HIV epidemics among MSM by harmonising HIV/STI surveillance in Europe, but also to share knowledge, experiences, and perhaps most importantly given the cross-border threat of HIV, develop and locate strategically HIV prevention activities at local, European and international levels.

Set within this context, the overall objective of the Sialon II project was therefore to carry out HIV/STI surveillance among MSM complemented by targeted and meaningful prevention. Specifically, the project had a series of ambitious objectives including: piloting of a bio-behavioural survey using TLS and RDS across thirteen European cities; estimating anti-HIV-Ab prevalence among MSM in cities where the TLS method was adopted, and anti-HIV-Ab, Syphilis, and HBV-HVC prevalence among MSM in cities where the RDS method was adopted; as well as identifying, describing, and analysing sexual risk behaviour patterns, prevention needs and sexual health in the MSM population.

In this final Chapter of the report, some of the key conclusions based on the findings of the Sialon II survey are presented along with a series of broad recommendations to inform future policies and actions. It is beyond the scope of this current report to provide detailed and country specific conclusions and recommendations; however, these will be provided in future articles and other publications.

Conclusions and recommendations

Data from the Sialon II survey have provided a wealth and diversity of insights regarding (as examples): access to prevention programs and testing in each partner country, results on sexual behaviour amongst MSM

in the last six months (with steady and non-steady partners) including condom use and "fisting"; as well as findings relating to commercial sex, HIV and other STIs, treatment and viral load, substance (mis)use, and sexual health (sexual satisfaction, sexual safety, and sexual autonomy). In doing so, the project has achieved its objectives comprehensively.

However, of importance in this process have been two key factors contributing both to the scientific quality and to the validity of these achievements. First, in collaboration with the European Commission and with other project partners, namely ECDC, WHO, UNAIDS, members of MSM communities, and other stakeholders, the Sialon II project has contributed actively to the harmonisation of HIV/STI surveillance in Europe, in line with the most advanced survey methods adopted for the so-called "hard-to-reach populations". Adoption of the Second Generation Surveillance Systems (SGSS) approach along with the use of common core indicators (GARPR; 1.11, 1.12, 1.13, 1.14) has allowed the project to 1) gather robust, reliable, and valid bio-behavioural data on the HIV epidemic in each country among one of the most affected and 'at risk' populations of acquiring HIV and other STIs, in this case MSM; and 2) maintain the highest scientific and ethical standards in project design, implementation, and evaluation – and in doing so, provide a trustworthy source of relevant and comparable data for public health authorities (PHAs) and NGOs in each partner country to develop and inform HIV prevention strategies and actions.

Second, active involvement and participation of gay communities in all phases of the project (from planning, design, implementation, and evaluation) was a crucial factor in the successful implementation of the project. Members of various MSM communities were involved in different ways such as project partners, project participants, as well as project stakeholders. Although adopting such a participatory approach to research can be challenging, it is important as it represents a move away from MSM as passive objects of scientific enquiry, and instead moves towards a view that MSM are social and cultural actors with a unique perspective and insight into their own realities. Moreover, participatory approaches have a number of advantages over more conventional methodologies where the target population are commonly excluded. In this case, the benefits of meaningful and systemic MSM participation were multiple and existed at both individual and project level. At an individual level, many representatives from the MSM community were involved directly in data collection, and in the process, thus benefited by developing new skills, knowledge, and experience in conducting epidemiological research as well as conducting prevention needs assessments, conducting outreach, and working with gay businesses. At a project level, benefits of MSM involvement were numerous and included (but were not limited to): informing project decision-making around appropriate and culturally sensitive actions and process; refining the prevention and communication strategies to be implemented at local/European level; identifying how best findings should be communicated and to which audiences, and; perhaps most importantly, helping ensure the project findings are as valid as they can be in representing MSM communities in Europe.

It should be noted that no virtual contexts (e.g. gay social network Internet profiles) were included in the Sialon II survey. The EMIS survey, for instance, can represent an interesting and complementary survey, that can be further used in order to analyse differences, overlapping and "balancing" between different survey approaches and related estimates (EMIS, 2013). This would allow researchers, policy makers and NGO representatives in gaining an even better understanding also of contextual factors (e.g. virtual versus non-virtual settings) linked to risky behaviours and to the HIV-STIs epidemic, as well as new directions in both epidemiological research and prevention activities.

From a policy and prevention perspective, the Sialon II project has confirmed the HIV epidemic among MSM in Europe with prevalence varying between 2% and 20% and has highlighted the range of different prevention needs among MSM living in the participating cities. For instance, the relatively high number of people unaware of their HIV status in certain cities calls for further epidemiological studies to better monitor the HIV epidemic, but also for prompt and concrete measures at multiple levels (community, policy, health sector) to reduce the number of undiagnosed HIV infected MSM. In addition, the use of GARPR indicators on prevention programmes (1.11 and 1.13) provided comprehensive evidence on the need for more effective interventions, especially for young MSM.

Moreover, the available data on perceived homophobia suggests the need for adopting gay-friendly approaches across different cultural, political and social levels. In other words and in line with the ecological sys-

tem theory (Bronfenbrenner, 1979), at the level of legislation (macro-level) for instance, laws related to same-sex partnerships legally recognising same-sex marriage or civil unions might improve the acceptability of homosexual relations at the population level. At the hospital setting level (e.g. Infectious Diseases Department), that is, at meso-level, providing specific training to the health care staff (counsellors, medical doctors, nurses) could improve a gay-friendly and sympathetic attitude among the personnel, which may facilitate health seeking behaviours in MSM communities.

This latter point of needing to tackle homophobia (and stigma) should not be underestimated and is essential for improving policy and prevention initiatives at local and European level. Societal rejection and criminalisation of homosexuality leading to homophobia is a structural determinant associated with HIV risk in MSM (Mayer et al., 2013) that must be addressed. For instance, it is well known that the internalized homophobia (generally defined as the experience of negative feelings toward oneself as a consequence of internalizing negative attitudes towards homosexual people that can be common in a given community) is often associated with an increased risk for HIV acquisition and transmission. This is partially due to increased risk behaviours (related to factors such a low self-esteem, a low perceived control over sexual risk-taking) (Ross, 2013) and partially to a decreased engagement in prevention and care.

In Sialon II, perceived discrimination or "homonegativity" which is linked directly to the frequency with which MSM openly declare their sexuality (so-called "outness") were both investigated in the survey. In many study sites, particularly in Central and Eastern European countries where homosexuality has been decriminalised relatively recently, the level of perceived negative attitudes was very high with men less likely to be 'out' than from Western European countries. Similarly, other findings from Sialon II also indicate societal homophobia. For instance, although overall HIV testing uptake across Sialon II cities was generally low (with quite a high number of participants having "never tested"), this was particularly the case in Eastern European survey cities. Similarly, in these same cities, there were a high number of HIV positive participants who were not aware of their real HIV-status, evidence of low condom use, and poor treatment coverage for HIV positive individuals.

The segmentation and the complexity of the MSM population which this project has contributed to identifying, provides also useful indications regarding the necessity to design targeted HIV prevention and health promotion interventions by subgroups. Despite the fact that MSM engage in similar behaviours and practices, the term defines a transmission method, without in reality recognising the diverse identities, behaviours, and cultures, which are included. To design an effective and comprehensive strategy to achieve a HIV transmission reduction therefore requires a clear understanding of different MSM subcultures.

Broadly, young MSM (<25 years) presented a particularly vulnerable subgroup of MSM, for example, because they may have experienced bullying and social exclusion at school and at home, and may still be economically dependent on their family. Together these factors can render this subgroup as particularly prone to depression and other mental health conditions, risky behaviours including voluntary exposure to HIV, substance (mis)use, and in some cases suicide ideations and behaviours (Mayer et al., 2013). In the Sialon II survey, UAI was frequent among younger MSM together with the use of drugs and the high perceptions of homonegativity, that is, the perception of negative attitude towards MSM. A comprehensive approach to sexual risky behaviour reduction therefore, should be complemented by the inclusion of actions addressing social exclusion, homophobia and discrimination and vulnerability of young MSM.

Other subgroups reached through the Sialon II survey, such as the commercial sex workers and the MSM who have sex with female partners, can be particularly relevant in terms of a bridging effect where these specific populations can serve as a bridge for transmitting the HIV infections into non-high risk populations. For these two subgroups, data were collected only through the RDS survey. In terms of commercial sex with other male partners or with female partners, data points to low levels of involvement in this activity, with the exception of Bucharest. With regards to sexual intercourse with female partners (steady or non-steady), again, data suggests that a minority of participants engaged in this behaviour in the past six months. However, the percentage of behaviourally bisexual men seems to be present in all study sites, even if a considerable variation is reported. The high number of episodes of unprotected sex with women represents an alarming issue that needs to be addressed also in terms of prevention actions tailored to reach these very specific – but not irrelevant – subpopulations.

Other subgroups identified in Sialon II include high numbers of MSM attending venues from other European countries included migrants (non-native or non-resident MSM) and tourists. This raises a number of issues: 1) MSM may experience multiple marginalisation on both ethnic and sexual identity grounds which can render them particularly exposed to higher risk; 2) Although reasons for the presence of non-native born MSM differ from city to city, migration driven by economic reasons is one of the most common phenomena meaning that such sub-populations of MSM may, once again, be increasingly vulnerable; 3) Finally, tourism may also have contributed to the presence of non-native born MSM in the Sialon II survey cities. Given the presence of tourists is often limited to short periods, the opportunities for intervention is limited when compared to the resident MSM population.

The above issues all suggest that inclusion and prevention policies/actions need to take the heterogeneity of MSM populations into account including young MSM, those from (minority) ethnic backgrounds, migrants, commercial sex workers, MSM who have sex with female partners and tourists. These issues also suggest that gay venues where MSM were recruited (in TLS) need to be embraced as potential settings for health particularly for 'mobile' MSM. In other words, as shown by the Everywhere Project (Sherrriff and Gugglberger, 2014), structural and community level interventions that embrace gay businesses as settings for HIV and other health promotion and public health interventions, can provide an important base to reduce HIV transmission and in doing so, target strategically different subgroups of MSM (e.g. resident and non-resident MSM).

Conceptualising gay venues as settings for health can also be useful for supporting condom distribution as a simple cost effective preventative measure. Despite this, Sialon II findings suggest that condom distribution programmes and/or interventions appear to remain difficult if not impossible to implement consistently and sustainably in many study cities: in many cases, lack of economic resources for the local NGOs or Institutions seems to represent a crucial barrier. A European-wide comprehensive condom distribution strategy at multiple levels (e.g. associations/NGOs, gay venues) needs to be developed and promoted, as basic and cost-effective strategy for reducing the transmission. Together with the Everywhere project framework and subsequent co-operation of business owners, such a strategy may help to maximize the impact of condom distribution, the resources used, and the synergic scaling up of single actions into larger and broader prevention frameworks.

In a similar way to condom distribution, increasing the uptake of HIV testing also remains a challenge in many European countries. However, community based testing (such as via gay venues) using point-of-care rapid HIV testing represent an important solution given it can be implemented easily by NGOs in Europe with the direct involvement and supervision of local public health services. Initially developed for low-middle income countries this strategy is becoming more and more relevant when a "Test and Treat" policy is adopted by PHAs.

Testing policies integrated with access to ART represent an important milestone in the prevention of infection both because of its efficiency in economic terms and also because it focuses on synergy between treatment and prevention. The number of non-diagnosed infections is alarming in some countries (as demonstrated by the Avidity Index). Testing promotion, whether in a clinic or by means of a rapid test, is a pressing need, especially in the Central and Eastern European cities that participated in the Sialon II survey. However, testing expansion depends on normalising HIV testing, that is, making the HIV testing process more like that for other screening and diagnostic tests (ECDC, 2010), and for this specific policy actions must be adopted by national/regional PHAs. However, as noted earlier, policy actions must also address the social determinants of low uptake of testing for HIV and other STIs such as homophobia and stigma. The EC in its Communication to the European Parliament and in its successive working staff document has adopted a clear policy in line with the need to expand the HIV testing and linkage to care (EC, 2009, 2013).

Moreover, the findings on co-infections including HIV-syphilis, HIV-HBV, and HIV-HCV underline the importance of periodical serological testing which should be actively offered to the MSM population.

The "Test and Treat" approach is part of the broad bio-medical prevention strategy described in a recent review by Ho et al (Simon, 2016). This strategy aims at decreasing the risk of HIV transmission by reducing the risk associated with the exposure to the HIV virus of other STIs agents. Interventions that are part of the bio-medical approach could be the treatment of STIs, the use of ART among HIV infected individuals to decrease the risk of HIV transmission (effective treatment and resulting low level of viral load – treatment as prevention or TasP), the

short term use of ARTs by HIV-negative individuals after accidental exposure to HIV (post-exposure prophylaxis; PEP) and the regular assumption of ART by HIV negative individuals to reduce the transmission probability during intercourse with potentially infected partners (pre-exposure prophylaxis; PrEP).

Among other biomedical interventions, Sialon II data suggest that PEP is available in all participating cities for medical staff in case of accidental exposure to HIV. Less clear however, is whether this policy is applied in all cities for MSM accidentally exposed to a potential HIV positive partner during a sexual contact. The possibility of PEP should be pursued by the local NGOs together with the relevant PHAs.

With regard to PrEP the picture is even less clear. PrEP with consistent condom use currently constitutes an as yet unknown tool with regard to the efficacy of reducing the probability of infection. However despite growing evidence of efficacy in clinical trials, it is still not clear if the same benefit can be transferred "*sic et simpliciter*" to everyday life. In addition in many European countries a clear policy on the PrEP use has not yet been established waiting for more evidence on real life efficacy and safety. According to Beaten (Baeten, 2013) "As *with all prevention strategies, PrEP is only effective if used, and maximum PrEP benefits, at both individual and population levels, will likely be achieved by combining PrEP with other effective HIV prevention interventions*". Despite these current uncertainties, this approach may become in the future a further instrument to be used to try to control the HIV epidemic.

Considering the results of the Sialon II survey, it is clear that in addition to tackling homophobia, promoting testing, and improving condom distribution networks, more effort also needs to be directed towards the suppression of viral load and improving care patterns for those already infected with HIV (in all cities but particularly in Central and Eastern European cities). Such a measure is essential to increase the life expectancy of HIV infected MSM and to reduce the probability of onward transmission. The substantial and effective viral load suppression of HIV infected individuals can lead to viral load suppression at a community level and to a subsequent reduction of the HIV transmission probability per single sexual act. However even in the most optimistic forecast it will take years to have an appreciable impact in lowering community viral load for MSM.

With regard to risk behaviour, it is necessary to intensify the use of campaigns that are aimed at highlighting the risks of transmission linked not only to the lack of condom use, but also to the concomitant use of drugs during sex, particularly those defined as party drugs. Information alone is not sufficient for behaviour change but it does constitute an important base upon which additional interventions can be developed. In recent years, HIV has received less and less attention from the media with the result that the problem has faded from the public view including public health commissioners, and often among the gay community too. However, "new" MSM become sexually active every day and the need for cultural and socially relevant information alongside wider interventions is therefore ever present.

Finally, the findings of Sialon II survey represent a valid contribution to the pool of epidemiological research that has been undertaken to date in the area of HIV/STI prevention among MSM. However, at the same time, a more in-depth knowledge of how the HIV/STIs epidemic is evolving among MSM is still of crucial importance. A better understanding of the different components (such as contextual factors, risky and healthy behaviours) together with reliable data in line with the Second Generation Surveillance System still remain the cornerstones of any effective intervention.

Recommendations in brief

MSM community

- Promote and where possible provide low-threshold, community-based voluntary HIV and STI testing and counselling, in order to reduce barriers and to increase access to testing;
- Prioritize the fight against stigma and discrimination (particularly faced by HIV positive MSM), to be included as one of the main topics in information/prevention campaigns, ensuring that the MSM perspective is properly considered;

- Organise the community for scale up of biomedical HIV prevention strategies, in order to increase acceptability and access to these new strategies;
- Advocate with Public Health Institutions for the availability and expansion of access to PrEP and PEP for HIV;
- Promote and empower networks of MSM or gay associations across different EU and neighbouring countries, in order to support those countries where the gay community is still invisible and hence prevention activities are poorly developed.

National and regional authorities

- Conduct nation-wide bio-behavioural surveys, in line with the Second Generation Surveillance System, including a prevention component to gauge the numbers of undiagnosed and new diagnosis and to curtail the epidemic;
- Carry out modelling of the data from a statistical point of view to identify the prevention needs and the prevention components to be included in order to maximise the impact of public health interventions;
- Identify and target sub-groups for prevention activities, especially in case of limited funding;
- Foresee adequate funding to ensure continuity of prevention activities;
- Collaborate with gay venue owners and settings for the promotion of sexual health initiatives for MSM;
- Specifically, foresee a comprehensive condom and lubricant distribution strategy which includes a framework for condom distribution in gay venues as a simple cost effective preventative measure (including practical information on how to use condom and lubricant);
- Collaborate with mobile app owners to gauge interest in reaching out to the community with testing reminders, stigma reduction strategies and educating the community on new prevention technologies such as PrEP, etc.
- Consider the widespread use of Rapid (and possibly self-testing) Tests for HIV and Syphilis as part of a public health strategy to address issues such as: low levels of testing, poor rates of test collection results, higher transmission rates in early stage of infection;
- Invest in testing policies integrated with access to antiretroviral treatment (ART) which represent an important milestone in the prevention of infection both because of its efficiency in economic terms and also because it focuses on synergy between treatment and prevention;
- Foresee "test and treat" policies as described above as part of a broader strategy to ensure targeted care for all MSM living with HIV including ART, regular STI screening and treatment; individual counselling, sexual health promotion and access to peer-support groups. Activities in this regard should be planned and implemented in close collaboration with the MSM community; Guarantee that the Post Exposure Prophylaxis is available not only for health care staff, but also for the MARPs, particularly the MSM community, according to well-defined procedures developed in partnership with the gay community;
- Guarantee that the Pre-Exposure Prophylaxis is considered as an option in the HIV prevention package, in line with the growing scientific evidence on this matter. In any case, PrEP availability should be tailored according to the local contexts;
- Include in the testing policies, strategies to actively encourage periodical serological testing to MSM in order to address the problem of STI co-infections (Syphilis, HBV and HCV), and considering – when appropriate – self-testing;
- Engage with and create an enabling environment (e.g. funding, medical support services) for NGOs to pursue prevention activities as those best placed to reach MSM;
- Promote and strengthen the increase of vaccination campaigns for Hepatitis A and B and consider vaccination for human papilloma virus (HPV);
- Put in place cross-cutting policy actions (e.g. health, education, social care etc.) with appropriate resource allocation and with the cooperation of multiple stakeholders (MSM communities, NGOs, public sector organisations including educational institutions) in order to promote social integration and to address stigma and discrimination toward the MSM community.

EU Institutions

- Prioritise additional research in the area of HIV among MSM, with a view also to linking different financing mechanisms (e.g. Public Health Programme, Horizon2020, European Fundamental Rights & Citizenship (FRC) programme) in order to maximise the projects impact;
- Foresee a wide participation of Member States with adequate funding mechanisms, in particular Member States from Central Eastern Europe where the identified problems appear to more pressing (e.g. low level of testing, low level of prevention actions, less resources in terms of clinical testing, high level of risk behaviour, higher level of stigma, higher number of bisexuals) which could be related to stigma);
- Prioritise exchange of expertise and capacity among Member States in terms of survey design and implementation as well as with regard to prevention activities, in particular as a means to ensuring the use of standardized data collection methodologies so as to have comparable data;
- Promote multidisciplinary actions under existing financing mechanisms (e.g. Public Health Programme, Horizon2020, European Fundamental Rights & Citizenship (FRC) programme) in order to better address issues of stigma and discrimination, as main enabling or disabling factors of access to HIV test;
- Ensure the involvement of MSM community representatives in the planning and programming of funding for HIV prevention actions;
- Foresee a Europe-wide information campaign, with a particular focus on awareness of one's own HIV and STI status., to get the issue of HIV prevention back in the public eye and on national governments' agenda;
- Foster a scientific debate on the potential impact of new available tools (e.g. PrEP) at community level (e.g. in terms of epidemic patterns and cost-effectiveness), ensuring that the evidence of such a debate is considered in current and evolving prevention strategies.

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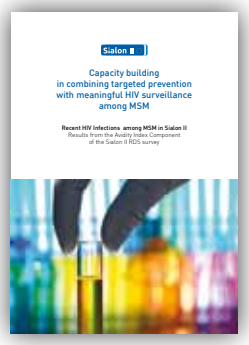
Overview of the most relevant Sialon II deliverables

Report on a bio-behavioural survey

The Report includes a detailed description of the main results from the bio-behavioural survey implemented in 13 EU countries

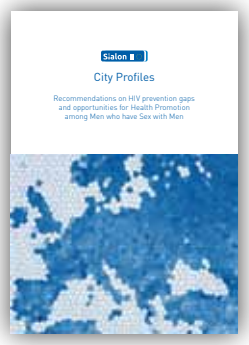
Report on recent HIV infections among MSM in Sialon II

The Report includes the results from the Avidity Index Calculation exercise performed in RDS countries on HIV positive samples



City Profiles

The document presents a list of recommendations on HIV prevention gaps and opportunities for health promotion among MSM in the participating cities

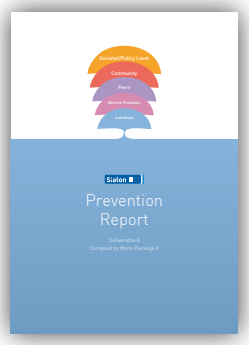


The Sialon II project was funded under the European Commission's (EC) Public Health Programme 2008-2013 (Work Plan 2010).
For more information: http://www.sialon.eu/en/home/

Overview of the most relevant Sialon II deliverables

Prevention Report

The Report includes a detailed description of the main prevention outcomes, strategies and actions implemented in Sialon II



Prevention materials

Scratch-card for prevention,
Prevention Info-pack with testing information and condom+lube

Avidity Index Workshop DVD

The DVD includes a 1-hour training video on how to perform the Avidity Index Calculation for HIV

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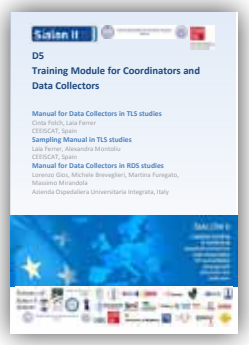
Overview of the most relevant Sialon II deliverables

Training module for data collectors

The Manual includes training materials for data collection through Time-Location Sampling and for Respondent-Driven Sampling methods

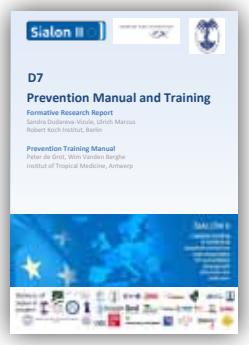


Training module for lab technicians

The Manual includes lab methods and testing algorithms for bio-behavioural survey using Time-Location Sampling and Respondent-Driven Sampling

Prevention Manual and Training

The Manual includes the main results from the Sialon II Formative Research and a specific Prevention Training for data collectors



Sialon II

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