D1: Review of HIV and sexually transmitted infections among men who have sex with men (MSM) in Europe

Work Package 1, ESTICOM Project (European Surveys and Training to Improve MSM Community Health)

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- **Objective 1**: A pan-European online survey of men who have sex with men (European MSM Internet Survey, EMIS 2017)
- **Objective 2:** A pan-European online survey about knowledge, attitudes, practices and training needs of community health workers who provide health-related services and support for MSM in EU countries (European Community Health Worker Online Survey – ECHOES).
- **Objective 3**: Development and piloting of a training programme for MSM-focused community health workers, intended to be adaptable for all EU countries.

This report falls under Objective 1, which aims to gather evidence on the sexual health of MSM in Europe, including epidemiological and behavioural data, as well as information on the policy environment underpinning MSM sexual health and access to sexual health services. The specification for this report (Work Package 1) was outlined as follows:

Work Package 1: A review of the sexual health, HIV/AIDS, STI, viral hepatitis (B/C) epidemiological and policy situation in the EU and neighbouring countries, amongst men who have sex with men (MSM).

This report was written and prepared by members of Work Package 1:

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Contents page

List of figures

List of tables

List of acronyms

aOR	adjusted odds ratio
ART	Antiretroviral therapy
CLAI	Condomless anal intercourse
CB-VCT	Community-based voluntary counselling and testing
CI	Confidence interval
ECDC	European Centre for Disease Prevention and Control
EEA	European Economic Area
EMIS	European MSM Internet Survey
ESTICOM	European Surveys and Training to Improve MSM Community Health
EU	European Union
GBL/GHB	Gamma-butyrolactone/Gamma-hydroxybutrate
GP	General practitioner (doctor/physician)
GUM clinic	Genitourinary medicine clinic
HAV	Hepatitis A virus
HBV	Hepatitis B virus
HCV	Hepatitis C virus
HIV	Human immunodeficiency virus
HIV-COBATEST	HIV community-based testing practices in Europe
HPV	Human papilloma virus
IDU	Injecting drug user
IH	Internalised homonegativity
LGBTQ	Lesbian, gay, bisexual, transgender and queer
LGV	Lymphogranuloma venereum
MSM	Men who have sex with men
OR	Odds ratio
PEP	Post-exposure prophylaxis
PLWH	People living with HIV
PrEP	Pre-exposure prophylaxis

RDS	Respondent driven sampling
STI	Sexually transmitted infection
TLS	Time-location sampling
UAI	Unprotected anal intercourse
VCT	Voluntary counselling and testing
WHO	World Health Organisation

Executive summary

Background

In the European Union (EU) and the European Economic Area (EEA), MSM remain the sub-population most affected by the HIV epidemic, with 42% of new HIV diagnoses in 2015 being among this group. Co-infections with HIV and other sexually transmitted infections (STIs) are common, and data from a number of countries indicate increasing numbers of diagnoses of bacterial STIs (e.g. syphilis, gonorrhoea), as well as outbreaks of rarer STIs such as lymphogranuloma venereum and shigellosis, in recent years. The availability of data on diagnoses of HIV and other STIs among MSM, as well as on sexual risk behaviours and prevention needs, is variable. However, such data are vital in informing the planning and delivery of tailored and targeted HIV and STI prevention, diagnostic and treatment services for MSM.

The first European MSM Internet Survey (EMIS) was conducted in 2010 and gathered extensive information on the sexual health of over 180,000 MSM across 38 European countries. A follow-up survey, EMIS 2017, is planned to take place between September and November 2017. The aim of this report is to help inform modifications and changes to the EMIS 2010 questionnaire for use in the 2017 survey, and to identify some of the gaps in the research which EMIS 2017 might help to address. This report provides a broad overview of STIs among MSM in the EU and neighbouring countries, and includes three main sections which present i) epidemiological data on the prevalence and incidence of HIV and other STIs among MSM, ii) behavioural data on risk factors for HIV/STIs, and iii) information on barriers and challenges to the provision of sexual health services for MSM in Europe.

Prevalence and incidence of HIV and other STIs among MSM in Europe

The collection of comparable data from different European countries on the prevalence and incidence of HIV among MSM is challenging. In many countries, estimates of MSM population sizes have not been made, and definitions of MSM vary. Methods for estimating HIV prevalence among MSM also differ, being variably estimated using surveillance data and/or in modelling studies, or measured as self-reported or directly measured prevalence in studies with differing sampling and selection biases. However in general, HIV prevalence tends to be higher in Western compared to Eastern European countries, which is expected given that the epidemic started earlier in this region. Studies have reported HIV prevalence estimates among MSM ranging from lows of 0% to 3% in some Eastern European countries (e.g. Bosnia & Herzegovina, Belarus) to between 10% and 20% in some Western European countries (e.g. France, Germany, the UK, Spain, the Netherlands).

Few European countries have published MSM-specific HIV incidence estimates. Trends in new diagnoses reported to national surveillance systems are often used as a proxy for incidence, although it should be noted that such trends may be affected by changes in testing rates and/or the coverage of surveillance systems. However, data suggest that in Western Europe, trends in new HIV diagnosis among MSM were largely

stable between 2006 and 2015. In contrast, HIV diagnosis trends among MSM in Central and Eastern Europe increased over this period. Improvements in the provision and uptake of testing services may partially explain the increasing numbers in these regions.

Between the mid-1980s and the mid-1990s, a long-term trend among MSM in Western Europe included steeply declining incidence of most bacterial STIs (e.g. syphilis, chlamydia, gonorrhoea), alongside reductions in numbers of anal sex partners and increases in condom use. However, declining STI trends were reversed during the latter half of the 1990s, when availability of effective treatment for HIV meant that people were regaining health and living for longer, and numbers of sexual partners began to increase again. In recent years, data from a number of Western European countries indicate continued increases in rates of bacterial STIs among MSM, alongside new risk management strategies such as HIV serosorting (declining condomless sex except with partners thought HIV sero-concordant).

In some Central and Eastern European countries, increases in the incidence of STIs among the general population occurred during the 1990s as a result of political, social and economic changes in the region, including deteriorating access to healthcare and the emergence of a large criminalized commercial sex work sector. Towards the end of the 1990s, legal and social changes in Central and Eastern European countries lead to improvements in opportunities for gay and bisexual men to meet and find new sexual partners. From 2000 onwards, opportunities for meeting new partners further improved with the emergence of online dating websites for MSM. These factors may have led to changing trends in the prevalence and incidence of STIs among MSM, although data disaggregated by transmission risk group are sparse, and infections among MSM may also be underreported due to stigmatization of homosexuality.

Some bacterial and viral infections that are generally not regarded as primarily sexually transmitted may, under certain conditions, become sexually transmitted among MSM. For example, since about 2000 hepatitis C has emerged as an STI primarily among HIV-positive MSM. Other pathogens, including highly infectious enteric pathogens (e.g. hepatitis A virus, s*higella* species) have also caused occasional outbreaks, generally among sub-groups of men with higher risk behaviours (e.g. attending public or private sex parties, those engaging in group sex).

Risk factors for HIV and other STIs among MSM

Individual-level risk factors for HIV and STIs among MSM include high numbers of sexual partners, receptive and insertive anal sex, and co-infection with other STIs. Opportunities for risk include visiting sex themed venues (e.g. gay sex clubs, gay saunas, porn cinemas), and the use of alcohol and/or drugs before sex. Individual-level precautionary factors include HIV/STI testing and treatment, partner selection, condom use, and oral chemo-prophylaxis. Data on some of these factors were collected in EMIS 2010, and will be collected again in EMIS 2017. Less well understood behaviours which will be newly explored in EMIS 2017 include the use of psychoactive

drugs prior to or during sex, and use of smartphone networking applications to find sexual partners.

Recent evidence points towards increasing use of some psychoactive drugs among MSM, including crystal methamphetamine, gamma-hydroxybutrate (GHB)/gamma-butyrolactone (GBL), mephedrone and ketamine. Taken before or during sex, these substances facilitate sexual arousal and longevity of sexual contact, and are often used to facilitate sexual sessions lasting several hours or days with multiple sexual partners (the combining of sex with drugs is often referred to as chemsex). The prevalence of use of drugs typically associated with chemsex is geographically variable, and tends to be higher in cities (particularly Western European cities) and among HIV-diagnosed and young MSM. Data on chemsex among European MSM are sparse, however evidence suggests that it is associated with high risk behaviours such as condomless anal intercourse (CLAI), and increased numbers of sexual partners. Data collected during EMIS 2017 will provide information on the prevalence of chemsex across Europe, and will allow identification of priority target groups for interventions.

Some studies have reported that the use of online dating and social networking websites is associated with elevated odds for higher risk sexual practices among MSM. However, others have reported no association between online partner selection and behaviours such as UAI. Since about 2010, smartphone applications (apps) designed to help MSM find sexual partners have become increasingly popular. Few studies have explored associations between sexual networking app use and sexual risk behaviours among European MSM populations. EMIS 2017 will collect information on partner meeting venues, including both online and 'offline' or physical venues, allowing for identification of priority settings for interventions.

MSM are reported to suffer poorer mental health compared to the general male population, including internalized homonegativity (IH), defined as gay or bisexual individuals' inward direction of society's homophobic attitudes towards the self. Data from EMIS 2010 showed that IH was positively associated with unmet HIV prevention needs (a perception of not having control over sexual risk taking, and not finding it easy to say no to unwanted sex). EMIS 2017 will collect data on the prevalence and distribution of mental health concerns among European MSM, including anxiety, depression and suicidal ideation.

Gaps in HIV and STI prevention, diagnostic and treatment services for MSM

Despite recommendations for at least annual HIV testing of MSM in a number of European countries, significant proportions of HIV-positive individuals remain undiagnosed or are diagnosed late, while the availability and uptake of testing for other STIs is also variable. Several studies have shown that reasons reflecting gay and HIV-related stigma appear to be strongly associated with HIV testing decisions among MSM, and increasing the available range of testing options may help to increase uptake by providing greater privacy and confidentiality (e.g. home testing options), or

quicker, more convenient and gay-friendly services (e.g. community-based testing options). In 2016 Dublin Declaration monitoring[1], the most commonly cited barriers to providing HIV testing services for MSM included a lack of community-based testing services, and the ability of healthcare professionals to identify and screen asymptomatic patients who should be tested. A lack of sustainable funding for providing testing services was also mentioned, particularly by countries in Eastern Europe.

Across Europe the provision of diagnostic services for STIs other than HIV is variable. When testing is performed, blood samples (for detection of syphilis and viral hepatitis) and urine samples (for detection of chlamydia) are reasonably frequently collected, however penile and anal inspection (for detection of anal/genital warts and anal/genital herpes) and anal and pharyngeal swabbing (for diagnosis of rectal and pharyngeal gonorrhoea or chlamydia infections) are much more rarely performed. Thus anal/genital warts, anal/genital herpes and rectal and pharyngeal STIs are likely to be substantially underdiagnosed among MSM in many European countries. Studies in the UK have found that home or self-sampling STI testing kits are acceptable to MSM and can increase the uptake of testing for infections such as syphilis, gonorrhoea and chlamydia. Community-based HIV testing sites may also provide opportunities for increasing STI testing rates, by offering STI testing as part of comprehensive, gay/MSM-friendly sexual health services.

In 2016 Dublin Declaration monitoring, the most commonly reported challenge or barrier to providing HIV prevention services for MSM was a lack of sustainable funding. Other commonly reported barriers included stigma and discrimination among healthcare professionals, and the prevention knowledge and skills of healthcare professionals. Thus comprehensive healthcare worker training programmes which address the specific needs of MSM, as well as issues relating to stigma and discrimination, need further support. Other issues mentioned as representing gaps in HIV prevention included a lack of specific prevention services for MSM populations (which often include sizeable proportions of migrant MSM), a lack of tailored services for migrants (including lack of provision of interpreters or translators, and lack of initiatives to address cultural barriers and/or sensitive issues, particularly for undocumented migrants), and weak sexual health education programmes in schools (e.g. lack of focus on differences in sexuality and behavioural norms).

The high efficacy of HIV pre-exposure prophylaxis (PrEP) in reducing the risk of sexually acquired HIV infection has recently been demonstrated in a number of randomized controlled trials, and recent surveys in Europe show significant interest among MSM in using PrEP as part of a comprehensive, multi-component HIV-prevention package. However, currently only two countries in Europe (France and Norway) provide PrEP through their public health services. Gaps and uncertainties with

[1] The Dublin Declaration was adopted in 2004 and emphasises HIV as an important political priority in Europe and Central Asia. Signatory countries closely monitor, on a biannual basis, the implementation of actions taken to tackle HIV/AIDS in their country. Further details available at http://ecdc.europa.eu/en/healthtopics/aids/Pages/monitoring-dublin-declaration.aspx

regard to the implementation of PrEP in Europe include a lack of data on the size of key target populations, costs of implementation (cost of the drug as well as of service delivery), options for service delivery, concerns about adherence, drug failures and drug resistance, and concerns about the impact of PrEP on sexual risk behaviours and the incidence of STIs other than HIV.

In 2015, the World Health Organisation (WHO) recommended immediate initiation of antiretroviral therapy (ART) for all HIV-positive persons upon diagnosis, regardless of immunological status. In 2016 Dublin Declaration monitoring, 13/17 countries in the EMIS 2010 Western European region and 10/18 countries in the EMIS 2010 Eastern European region reported implementing this guideline in practice. The most commonly reported barriers to getting HIV-positive MSM across Europe onto treatment included weak referral systems, and stigma and discrimination within the MSM population. Three of 16 Western European countries (data not available for Switzerland) and 14 of 18 Eastern European countries reported that ART was not provided for undocumented migrants in their country, representing a major barrier for this sub-population in some countries, particularly in the Eastern European region.

Few data are available on the HIV continuum of care among MSM, although some estimates are available from the Sialon II study conducted in 13 European cities between 2011 and 2014. Although sample sizes were small, in this study the proportions of all HIV-positive men who were treated and had an undetectable viral load ranged from 0% in Bucharest and Sofia to 79.6% in Brussels. In general, the proportions of men who were diagnosed, on treatment and who had an undetectable viral load were greater in Western compared to Eastern European cities. Across all cities, the most significant drop-off point across the cascade was between the total number of HIV-infected men and those who were diagnosed, indicating that efforts to increase the uptake of HIV testing among MSM need further attention.

In 2016 Dublin Declaration monitoring, adherence and retention in care were the most frequently reported barriers to achieving viral suppression among people on treatment. Countries reported various different initiatives to ensure that people on treatment achieved viral suppression, including adherence counselling, the use of first line or tailored drug regimens, and training programmes for healthcare professionals.

1 Introduction

1.1 Background to HIV/STI control among MSM in Europe

In the European Union (EU) and the European Economic Area (EEA), MSM remain the sub-population most affected by the HIV epidemic, with 42% of new HIV diagnoses in 2015 being among this group (heterosexual contact was the second most common transmission mode, at 32% of all new diagnoses) (1). While the number of new HIV diagnoses has decreased among heterosexual men and women and among injecting drug users (IDUs) in the EU/EEA over the last decade, the number and proportion of new HIV diagnoses among MSM has increased, from 33% of all cases in 2005 to 42% of all cases in 2015 (1).

Co-infections with HIV and other sexually transmitted infections (STIs) are common among MSM, and alongside increases in the number of new HIV diagnoses, surveillance data indicate increasing rates of diagnoses of bacterial STIs (e.g. syphilis, gonorrhoea) among MSM in a number of European countries in recent years (2-6). Evidence also suggests increasing incidence of viral STIs such as hepatitis C (7, 8), as well as outbreaks of rarer STIs such as lymphogranuloma venereum and shigellosis (9), particularly among HIV-positive MSM. These data suggest a need to bolster effective multi-component HIV and STI prevention programmes for MSM in Europe.

Despite being a population at high risk, recent data published by the European Centre for Disease Prevention and Control (ECDC) indicate that almost half of all European countries do not have MSM population size estimates, and that countries also have limited data on sexual risk behaviours among MSM (10). Furthermore, national and European level surveillance data disaggregated by transmission risk group are not always available (e.g. for chlamydia). However, data on trends in diagnoses and on sexual risk behaviours among MSM are vital in order to inform the planning and delivery of tailored and targeted HIV and STI prevention, diagnostic and treatment services for MSM.

The first European MSM Internet Survey (EMIS) was conducted in 2010 and helped to address some of the gaps in the available data by gathering extensive information on diagnoses of HIV and other STIs (syphilis, gonorrhoea, chlamydia, genital/anal warts, genital/anal herpes, hepatitis C), sexual risk and precautionary behaviours, use of HIV and other sexual health services, and the extent of unmet prevention needs among MSM across Europe. It was the largest transnational survey among MSM ever conducted; in terms of the number of participants (over 180,000 MSM in 38 European countries), the number of countries covered by the survey, and the number of different language versions of the survey. A second round of the survey, EMIS 2017, is planned to take place between September and November 2017. The 2017 survey will build upon EMIS 2010 by collecting data on many of the same topics covered in 2010, but also asking questions in new topic areas such as use of HIV pre-exposure prophylaxis (PrEP), and emerging risk behaviours such as the use of psychoactive drugs prior to or during sex ('chemsex'), and use of smartphone sexual networking applications among MSM. EMIS 2017 will represent an invaluable source of data on

the sexual health and prevention needs of MSM across Europe, and will help in the design of HIV and STI prevention, diagnostic and treatment services.

1.2 Aim of the report

The aim of this report is to help inform modifications and changes to the EMIS 2010 questionnaire for use in the 2017 survey, and to identify some of the gaps in the research which EMIS 2017 might help to address. A broad review of the sexual health of MSM in the EU and neighbouring countries was conducted, consulting epidemiological data (data on the prevalence and incidence of HIV and STIs), behavioural data (data on risk factors for HIV/STIs among MSM), and information on barriers and challenges to the provision of sexual health services for MSM in Europe.

1.3 Structure of the report

This report includes three main chapters, in addition to this introductory chapter:

- Chapter 2 provides an overview of the prevalence and incidence of HIV and other STIs among MSM in Europe.
- Chapter 3 is a socio-behavioural review summarizing risk factors for HIV and STIs among MSM. The chapter focusses on new and emerging risk behaviours which will be covered in EMIS 2017, including the use of 'chemsex' drugs and of online social and sexual networking tools. Chapter 3 also includes a section exploring mental health among MSM, and its associations with sexual health.
- Chapter 4 considers barriers, challenges and gaps in the implementation of HIV and STI diagnostic, prevention and treatment services for MSM across Europe.

In all chapters, findings relating to MSM sub-groups, such as young, migrant or injecting drug user (IDU) MSM are presented, to the limited extent that these were available.

At the end of each chapter (or in the case of Chapter 4, at the end of each chapter sub-section), recommendations regarding data that should be collected during EMIS 2017 are made.

1.4 Methods

The methods used to gather information for each chapter are presented at the start of that chapter. Because each chapter considered a different topic, varying methods were used. Broadly, data were reviewed from key European studies conducted among MSM, including EMIS 2010, the Sialon II bio-behavioural study, and the HIV COBATEST Project (HIV community-based testing practices in Europe). (For descriptions of these studies, see Section 1.4.1 below). For Chapter 2, surveillance data published by the

ECDC, as well as national surveillance data for some countries, were consulted. For the socio-behavioural review presented in Chapter 3, searches for published peer-reviewed literature were run in electronic databases including Embase and Global Health. The reference lists of relevant papers were scanned, and grey literature published by AIDS or LGBT organisations (e.g. NAM Aidsmap[2], the LGBT Foundation[3]) was also consulted. In Chapter 4, in addition to key European studies among MSM, data from the 2016 round of Dublin Declaration monitoring[4] were obtained from the ECDC, and descriptive analyses were performed. Data on legal and regulatory barriers which impede the HIV care continuum in Europe were also obtained from the 'Barring the Way to Health' online database[5].

1.4.1 Description of key European studies reviewed

European MSM Internet Survey (EMIS) 2010

EMIS 2010[6] ran online for three months between June and August 2010, and gathered information on knowledge about HIV and sexually transmitted infections (STIs), sexual behaviour, and the use of HIV and sexual health related services by MSM. The survey was available in 25 different languages and was completed by more than 100 men in 38 countries, and by over 180,000 men overall, giving a very large sample size. Inclusion criteria were being at or over the age of homosexual consent in the country of residence and being sexually attracted to men and/or having sex with men.

The survey was actively promoted by five major international commercial websites[7] (the largest source of recruitment in many countries), but also across more than 200 other national and international websites (important sources of recruitment in some countries), as well as at a wide range of events and gay community settings in individual countries. The extent of survey promotion activities varied between countries, as did levels of recruitment, partly due to differences in available budgets for survey promotion (although the large majority of recruiting websites did not request payment for survey promotion). Five EMIS countries (Bosnia and Herzegovina, Croatia, Cyprus, Luxembourg and Malta) had no active partner at the time of data collection and did not undertake any country-specific recruitment activities. A further four countries (Greece, Hungary, Serbia and Slovakia) did not identify any country

[2] www.aidsmap.com
[3] http://lgbt.foundation/
[4] The Dublin Declaration was adopted in 2004 and emphasises HIV as an important political priority in Europe and Central Asia. Signatory countries closely monitor, on a biannual basis, the implementation of actions taken to tackle HIV/AIDS in their country. Further details available at http://ecdc.europa.eu/en/healthtopics/aids/Pages/monitoring-dublin-declaration.aspx
[5] Database maintained by the Global Network of People Living with HIV (GNP+) as part of the OptTest Project (Optimising Testing and Linkage to Care for HIV Across Europe). See http://legalbarriers.peoplewithhiveurope.org/en
[6] http://www.emis-project.eu/
[7] PlanetRomeo, Manhunt, Gaydar, Qguys, Qruiser

specific websites that could promote EMIS. Thus for many of these countries, the volume of responses (based on general population size) was lower than elsewhere.

A technical report presenting findings from EMIS 2010 was published in 2013 (11). Most analyses were grouped by geographical region, including four sub-regions in Western Europe (West, North-West, Central-West and South-West) and five sub-regions in Eastern Europe (North-East, Central-East, South-East (EU), South-East (non-EU) and East). Where relevant, the EMIS 2010 results cited in this report have been grouped or presented by sub-region. A full list of all countries included in each of the EMIS 2010 sub-regions is provided in the Appendix. In addition to the EMIS 2010 Technical Report, a large number of national and pan-European analyses of EMIS 2010 data have been published in the peer-reviewed literature, on a variety of topics.

Sialon II bio-behavioural study

The Sialon II bio-behavioural survey[8] was conducted among MSM in 13 European cities between 2011 and 2014, and aimed to collect meaningful surveillance data on HIV (and also – in four cities - on syphilis, hepatitis B and hepatitis C), as well as data on the sexual health prevention needs and service access among MSM. Approximately 400 MSM were recruited in each city, using two different recruitment methodologies (either time-location sampling (TLS) or respondent driven sampling (RDS), depending on the cultural and social characteristics of the participating city). In nine cities participants were recruited using TLS, and oral fluid samples were collected and tested for HIV (Barcelona, Brighton, Brussels, Hamburg, Lisbon, Ljubljana, Sofia, Stockholm, Warsaw). In four cities participants were recruited using RDS, and blood samples were collected and tested for HIV, syphilis, hepatitis B and hepatitis C (Bucharest, Bratislava, Verona, Vilnius). In all cities, a behavioural questionnaire was also completed, collecting information on sexual behaviours, HIV service access, and sexual health and well-being, including sexual satisfaction and safety.

Although TLS and RDS methods are effective in minimizing sampling biases among hard to reach populations, each method confers a number of characteristic strengths and weaknesses. In the Sialon II study, TLS methods recruited MSM who attended different types of gay venues. However, TLS methods tend to recruit larger proportions of younger men, and to exclude men who do not attend such venues. RDS methods are useful for sampling more hidden segments of the MSM population, including those who do not use gay venues. However, because it is a chain-referral based sampling method, it is vulnerable to recruiting specific types of individuals from defined social networks. For example, in the Sialon II study, the MSM sampled with RDS in Bucharest comprised a network of MSM who injected drugs and sold sex. Thus the strengths but also the limitations of each methodology must be taken into account when interpreting the data collected.

[8] http://www.sialon.eu/

HIV COBATEST Project (HIV community-based testing practices in Europe)

The HIV-COBATEST (HIV community-based testing practices in Europe) Project (2010-2013)[9] included 21 partners from 19 European countries, and aimed to improve the implementation and evaluation of community-based HIV voluntary counselling and testing (CB-VCT) practices in Europe. The project provided detailed information on how CB-VCT programmes are implemented in Europe, and has helped to establish a network of CB-VCT sites that monitor and evaluate HIV testing activity, and that conduct operational research on the implementation of CB-VCT services. Some of the results from the HIV-COBATEST Project are cited in Chapter 4 of this report.

1.5 Report limitations

Due to the broad remit and range of topics covered in this review, it was not possible to systematically address each of the topics presented in the individual chapters. Thus the report should be taken to represent a broad overview of key topics relating to the sexual health of European MSM. When interpreting the data presented in Chapter 2 (prevalence and incidence of HIV and other STIs), it should be borne in mind that diagnosis rates of new infections among MSM are often calculated using the total male population rather than the total MSM population, because of varying availability and limited comparability of MSM population size estimates. Thus rates of new HIV/STI diagnoses among MSM are likely to be underestimates. Furthermore, new HIV or STI diagnoses among MSM may be under-reported, particularly in countries where stigma and discrimination against MSM is ubiquitous. For the review of risk behaviours for HIV and other STIs among MSM (Chapter 3), only two electronic databases were searched (Embase and Global Health) and only material published in English was included, due to constraints on time and resources. In Chapter 4, which explores key challenges in the provision of prevention, diagnostic and treatment services for HIV and other STIs, data from the 2016 round of Dublin Declaration monitoring were obtained from the ECDC and used as a key source. However, in order to avoid the duplication of work currently being undertaken by the ECDC, these data could not be verified by consultation with individual country contacts, and so may contain discrepancies. However, any such individual discrepancies are unlikely to have changed overall results and findings. Despite these limitations, the review allowed us to make specific recommendations regarding changes to questions and topic areas to be included in EMIS 2017.

[9] https://eurohivedat.eu/

2 Prevalence and incidence of HIV and other STIs among MSM in Europe

2.1 Methods

This chapter provides an overview of the prevalence and incidence of HIV and other STIs among MSM in Europe. Relevant surveillance data from the ECDC were consulted and extracted, as were national surveillance data for some countries. For STIs other than HIV, reporting of transmission risk group is sometimes incomplete (i.e. not available for all countries (e.g. syphilis, gonorrhoea), or poorly reported across many countries (e.g. chlamydia)). In addition diagnosis rates of STIs among MSM are often underestimates, because the ability of surveillance systems to collect sensitive information such as sexual orientation is limited and varies between countries and health care providers. Furthermore, when rates of diagnoses of new infections among MSM are calculated, these are calculated using the total male population rather than the total MSM population, because of varying availability and limited comparability of MSM population size estimates. If diagnosis rates were calculated using the total MSM population, these would be many times higher (perhaps between 30 and 50 times higher, because MSM are usually estimated to represent between two to three percent of the adult male population). These limitations must be borne in mind when interpreting national and European level surveillance data. EMIS 2017 will make a contribution to the available data by collecting information on diagnoses of syphilis, gonorrhoea, chlamydia and other STIs among MSM, and will allow for investigation of trends over time by comparing results with EMIS 2010 (see Section 2.13 for a summary of relevant data points that will be collected during EMIS 2017).

Other key data sources consulted for this chapter included EMIS 2010 and the Sialon II bio-behavioural study. Key peer-reviewed papers in different topics areas were also reviewed, particularly for infections associated with occasional outbreaks among high-risk MSM (e.g. hepatitis A, shigellosis, invasive meningococcal disease, hepatitis C), because national surveillance systems do not always collect or publish data on such outbreaks.

2.2 HIV

2.2.1 Historical trends in HIV incidence among MSM in Europe

HIV started to spread among gay and bisexual men in Europe at different time periods in different geographical regions. In Northern and Western European countries (Scandinavian countries, UK, France, the Netherlands, Belgium, Western Germany, Switzerland, Austria) HIV started to spread largely unrecognized in metropolitan gay communities in the late 1970s and early 1980s, fueled by repeated importations from North America (12, 13). Peak incidences were reached around 1985/1986, when the first diagnostic tests became widely available (14). Spontaneous and promoted behaviour changes, such as reductions in numbers of anal intercourse partners and

increasing condom use, contributed to declining incidence of new HIV and STI infections in the late 1980s and early 1990s. However, incidence increased again in the late 1990s/ early 2000s (14-18).

In Southern Europe (Spain, Portugal, Italy), HIV initially spread mainly among IDUs, while transmission among gay and bisexual men increased gradually from the late 1990s onwards (12). In Eastern Europe, explosive HIV epidemics developed among IDUs from the mid-1990s, followed by increasing incidence of sexual transmission (19, 20). In Central and Eastern Europe HIV started to spread among MSM from the early 1990s, with incidence initially increasing slowly but then accelerating from the early 2000s onwards (12). In Eastern Europe heterosexual contact and IDU remain the main modes of HIV transmission, although the epidemic among MSM remains masked and often invisible because detailed information on mode of transmission is either unavailable or unreliable, due to high stigmatization of homosexual behaviour (19, 21).

2.2.2 Trends in HIV incidence between 2006 and 2015

Although pooled EU-wide HIV incidence estimates have recently been published (22), dis-aggregations by risk-group are not yet available. However, several Western European countries such as the UK, Germany and the Netherlands have published HIV incidence estimates for MSM. In the UK, incidence was estimated to have been largely stable between 2000 and 2010, with a slight increase in new cases between 2000 and 2003/2004, followed by a slight decline between 2003/2004 and 2006/2007 (23). In Germany and the Netherlands, incidence increased significantly between 2000 and 2005/2006, but then gradually declined between 2006 and 2015 (Germany, (24)), or between 2005 and 2011 (Netherlands, (25)).

In the absence of EU-wide HIV incidence estimates for MSM, here we review trends in rates of new HIV diagnoses per 100,000 male population as reported to the ECDC (1). It must be emphasized that due to the variable delays between infection and diagnosis, increases in incidence may become visible as increased numbers of new HIV diagnoses quite quickly, while declines in incidence will become apparent usually only with some time delay, depending on whether declines follow a period of stable or increasing incidence.

As reported by the ECDC and WHO Regional Office for Europe, the number of HIV diagnoses among MSM in the European region increased from 8,244 cases in 2006 to 10,849 cases in 2014 (1). While fewer cases were reported in 2015 (10,274), a decrease in diagnoses is less evident when delays in reporting are accounted for (1). Disaggregating the data by WHO sub-region (Western, Central, and Eastern Europe), HIV diagnosis trends among MSM in Western Europe were largely stable between 2006 and 2015 (see Figure 2-1 and Figure 2-2).

In contrast, trends in rates of new HIV diagnoses among MSM in Central Europe (Bulgaria, Croatia, Hungary, Romania and others) increased almost universally between 2006 and 2015, with particularly large increases in Cyprus in recent years

(see Figure 2-3 and Figure 2-4). There is high variability in the completeness of reporting of transmission risk group for Poland and Turkey, and increases in these two countries may be due primarily to improved reporting of transmission category (and also in Turkey, due to increased rates of testing) (1). In some countries, such as Romania, HIV diagnoses among MSM may still be underreported due to the high stigma associated with homosexuality. In interpreting the increasing numbers of new diagnoses in Central European countries, it is important to consider that historically there has been a much higher proportion of undiagnosed HIV among MSM in Central compared to Western Europe (in part because the epidemic is younger in the former region). Therefore, improvements in testing uptake may partly explain increases in rates of new diagnoses.

While the overall rates of new HIV diagnoses among MSM were lower in many Eastern European countries (e.g.Turkmenistan, Uzbekistan, Tajikistan, Azerbaijan) compared to Central and Western European countries, rates generally increased between 2006 and 2015 (see Figure 2-5 and Figure 2-6). In Eastern European countries overall, the officially reported number of new HIV diagnoses among MSM increased ten-fold from 80 in 2006 to 799 in 2015. This increase may be explained by improvements in ascertainment of transmission group, as well as improved targeting of testing by projects implemented and funded by the Global Fund to Fight AIDS, Tuberculosis and Malaria. In other countries however, such as Russia (data not shown), the social recognition of MSM has deteriorated and underreporting and under-ascertainment of transmission among MSM is likely increasing.

Figure 2-1 Rates of newly diagnosed HIV infections among MSM in Western Europe, 2006-2015 (countries with rates between 4 and 13 per 100,000)*

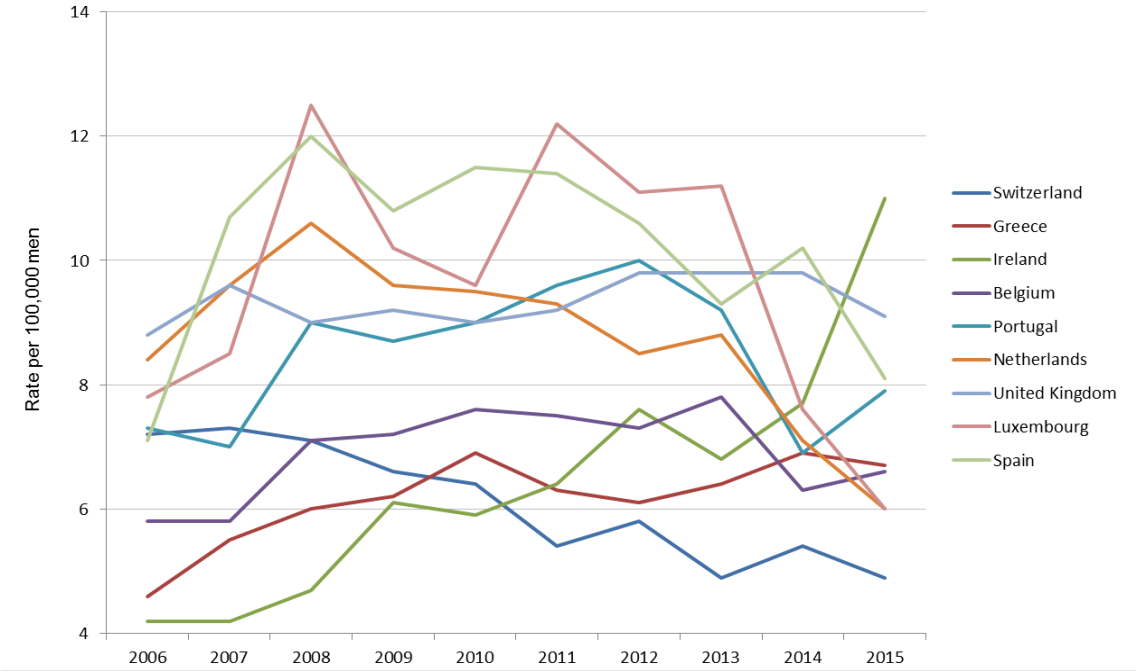
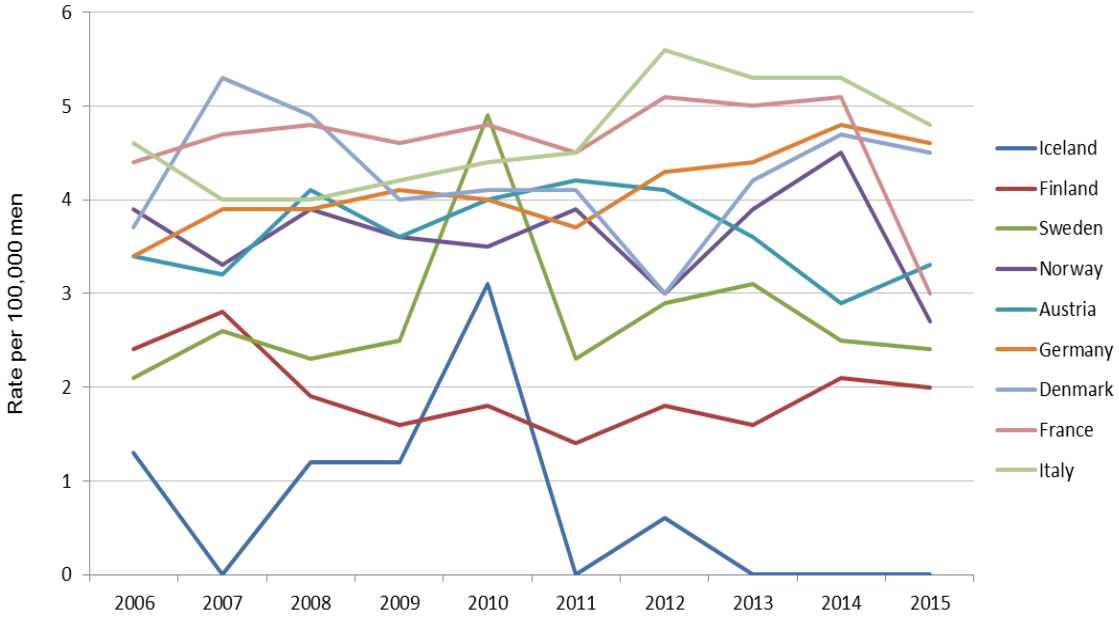


Figure 2-2 Rates of newly diagnosed HIV infections among MSM in Western Europe, 2006-2015 (countries with rates <6 per 100,000)*



*Source of data: ECDC/WHO Regional Office for Europe, HIV/AIDS Surveillance in Europe 2015 (1). As there was increasing coverage of surveillance systems in Spain and Italy, for these countries denominators have been adjusted for years during which there was no national coverage.

Figure 2-3 Rates of newly diagnosed HIV infections among MSM in Central Europe, 2006-2015 (countries with rates ≥2 per 100,000)*

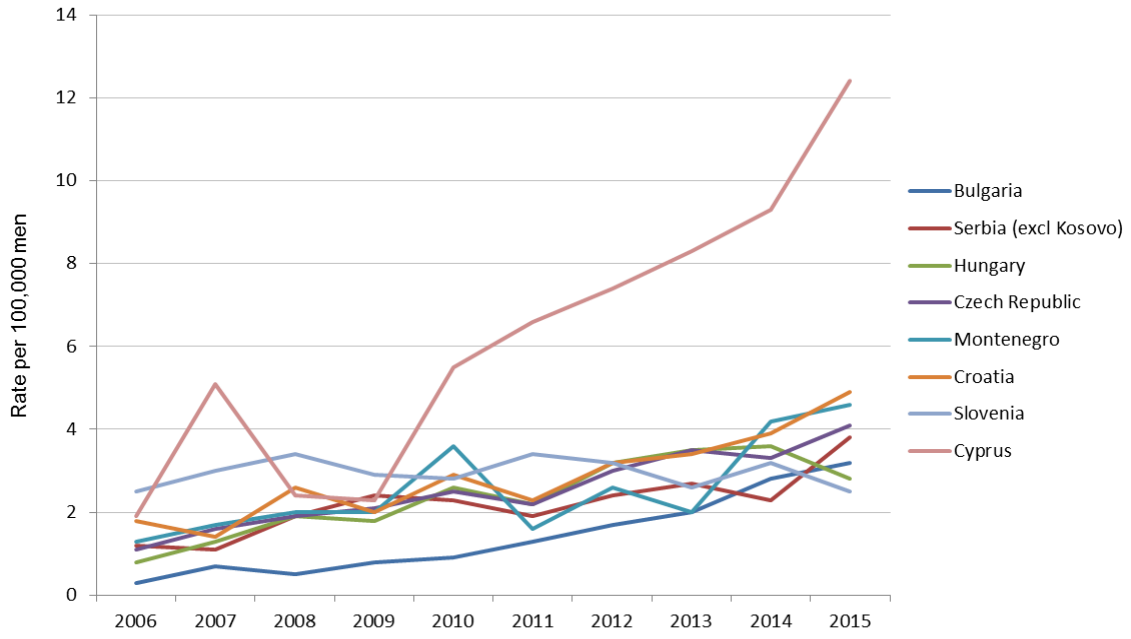
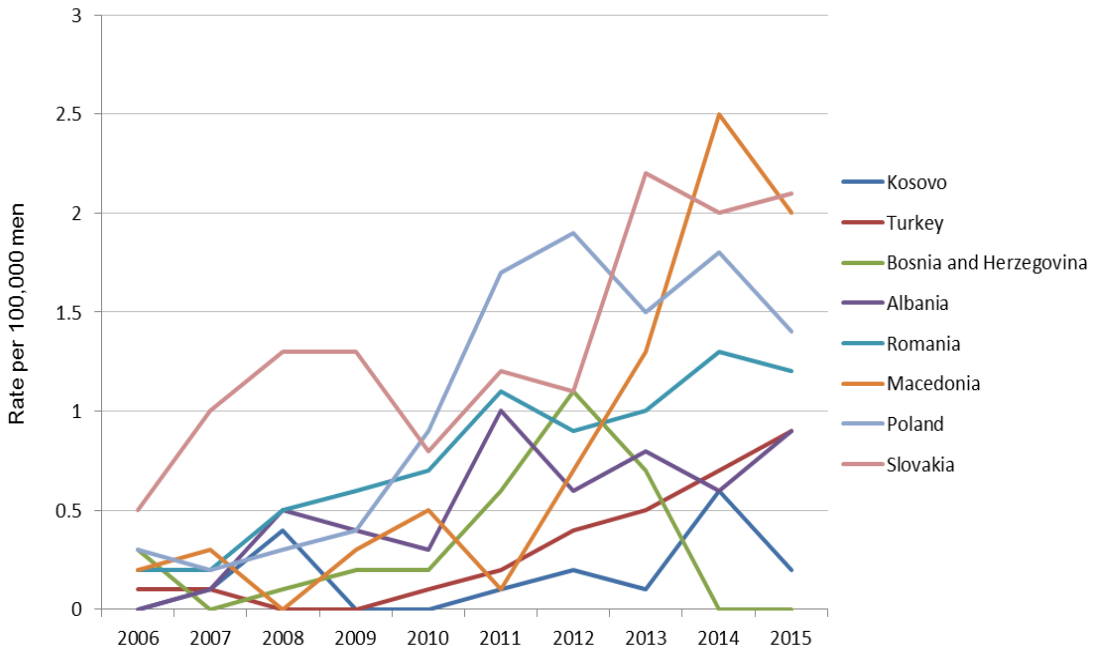


Figure 2-4 Rates of newly diagnosed HIV infections among MSM in Central Europe, 2006-2015 (countries with rates <3 per 100,000)*



*Source of data: ECDC/WHO Regional Office for Europe, HIV/AIDS Surveillance in Europe 2015 (1). Note that Poland and Turkey had low and variable completeness of reporting of transmission risk group.

Figure 2-5 Rates of newly diagnosed HIV infections among MSM in Eastern Europe, 2006-2015 (countries with rates ≥1 per 100,000)*

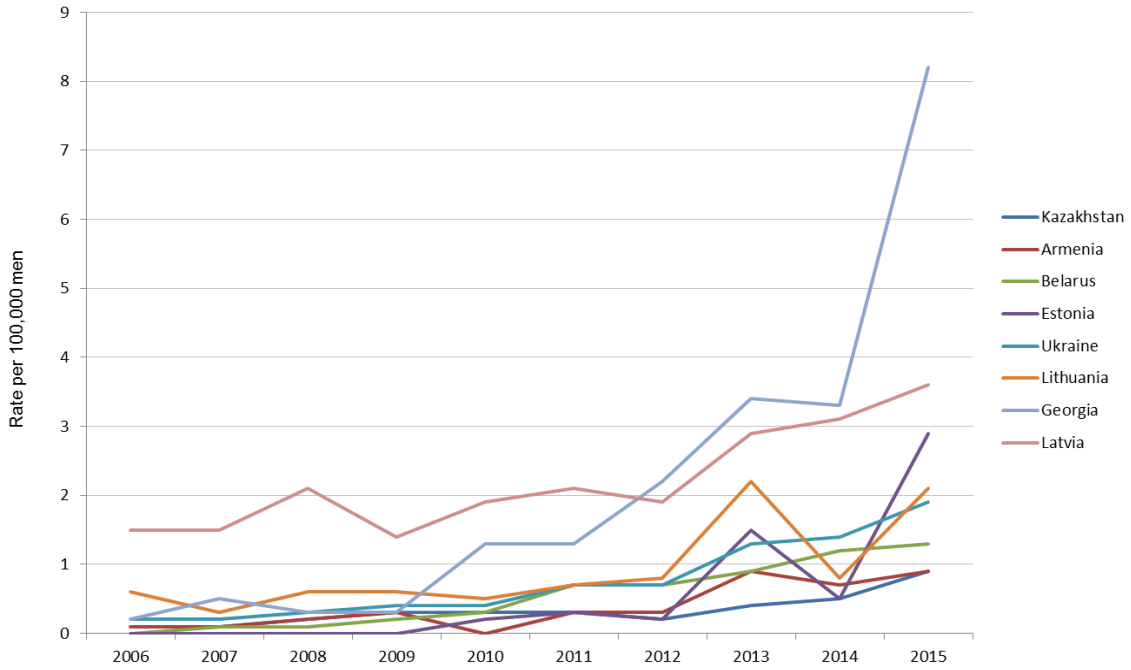
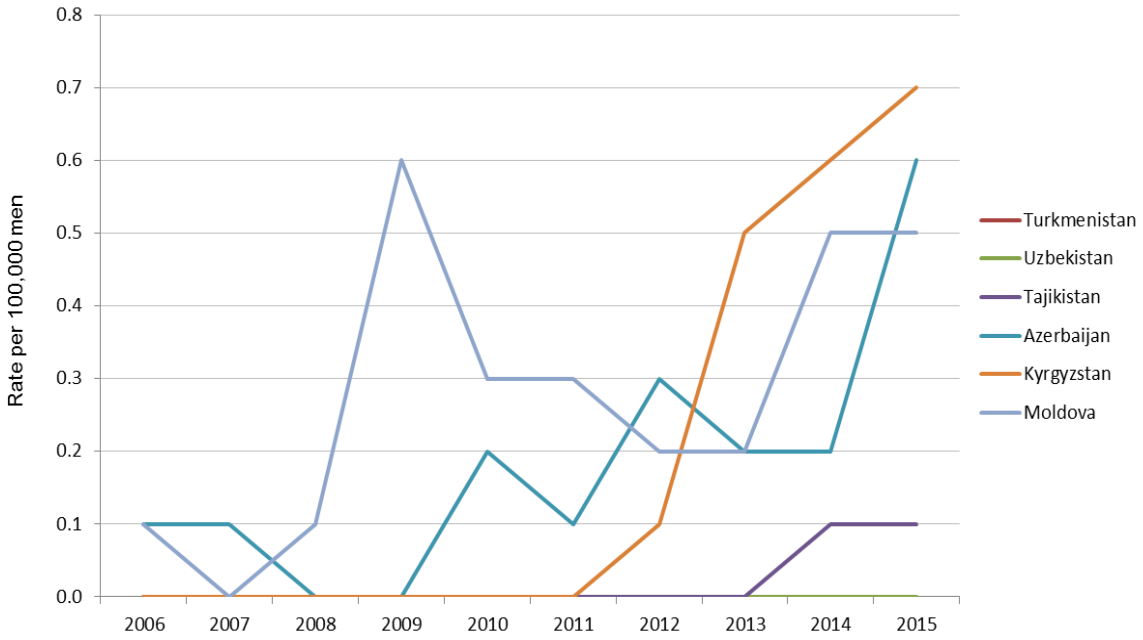


Figure 2-6 Rates of newly diagnosed HIV infections among MSM in Eastern Europe, 2006-2015 (countries with rates <1 per 100,000)*



*Source of data: ECDC/WHO Regional Office for Europe, HIV/AIDS Surveillance in Europe 2015 (1). Note that Estonia had high and variable completeness of reporting of transmission risk group.

Impact of migration on trends in new HIV diagnoses

One factor responsible for slight increases in rates of new HIV diagnoses among MSM in some Western European countries may be migration. For example, between 2006 and 2015 in the UK, the number of MSM estimated to have acquired their infection within the country remained relatively stable. However, the estimated number of infections among MSM who were born and acquired their infection abroad steadily rose over the same period (26). Similarly in countries like Germany, Ireland and Norway the number of new HIV diagnoses among MSM originating from other countries (particularly Latin American and other European countries) has increased in recent years (27-29).

In some Central and Eastern European countries, increasing trends in new HIV diagnoses may have been attenuated by increasing emigration of HIV-positive MSM, or MSM at increased risk for HIV, to Western European countries (30). In the EMIS 2010 survey considerable proportions (between approximately 20% and up to more than 50% for several countries) of survey respondents born in Central and Eastern EU countries participated in EMIS 2010 while living in Western European countries (11).

2.2.3 HIV prevalence among MSM

Challenges in estimating HIV prevalence among MSM

The collection of comparable HIV prevalence data for MSM from different European countries is highly challenging. One significant problem is the lack of a standardized methodology for estimating the size of MSM populations, as well as a common definition for MSM (e.g. the recency with which a man must have had sex with another man in order to be considered MSM, lower and upper age limits for defining MSM populations). HIV prevalence studies among MSM are also prone to selection and self-selection biases due to the lack of a representative sampling frame. Additionally, studies among MSM usually recruit self-defined gay and bisexual men, but rarely recruit MSM with other sexual identities. The ability to gather data on minority sexual identities is strongly associated with societal acceptance and attitudes towards these groups (31).

For their official estimates of HIV prevalence among MSM, countries use different definitions and methods for estimating the size of the MSM population. Some countries (such as the UK, the Netherlands, Denmark and Germany) estimate the size of the MSM population based on the proportion of men with self-reported same-sex experiences in representative population-based surveys, and then calculate HIV prevalence using the estimated number of HIV-infections among MSM based on surveillance data. Other countries use similar methods for estimating HIV prevalence, but MSM population sizes are based on expert estimations rather than population-based empirical studies. To estimate HIV prevalence, some countries use unadjusted data from prevalence studies with unknown selection and self-selection biases. Others calculate MSM population sizes and HIV prevalence based on studies using different methodologies and with varying age inclusion criteria. MSM population sizes have been

calculated as varying proportions of the adult male population, with lower age limits from 15 up to 20 years of age and upper age limits from 49 up to 65 years of age, or without any upper age limit.

Table 2-1 provides an overview of estimates of MSM population sizes and HIV prevalence among MSM in 38 European countries, using data from a number of different sources. One of the most extensive analyses estimating MSM population sizes in Europe was published by Marcus *et al* in 2013, and uses data from country national statistics as well as EMIS 2010 (32). Estimates of MSM population sizes were also reported to the ECDC as part of the 2016 round of Dublin Declaration monitoring[10], although no estimates were reported for 20 of the 38 countries included in EMIS 2010. Where data are available, differences in population size estimates are sometimes large (e.g. estimates for France: 275,000 reported in 2016 Dublin Declaration monitoring, 627,000 reported by Marcus *et al* 2013 (32). Estimates for the Netherlands: 111,000 reported in 2016 Dublin Declaration monitoring, and 230,000 reported by Marcus *et al* 2013 (32) – see Table 2-1).

Estimates of HIV prevalence among MSM similarly vary depending on what source is consulted. One analysis published in 2012 compared self-reported HIV prevalence in EMIS 2010 with official country prevalence estimates or with estimates from specific prevalence studies. This analysis demonstrated that overall, there was a high correlation between self-reported prevalence (as measured in EMIS 2010) and measured prevalence rates (33). However, self-reported prevalence in EMIS 2010 was usually higher than prevalence measured or estimated in other types of studies, particularly those using sophisticated modelling approaches (see Table 2-1). This suggests that HIV infections among MSM may be underreported to national surveillance systems, that the size of the total MSM population may be overestimated in modelling studies, and/or that HIV positive participants may be more likely to participate in internet surveys. Other possible reasons for discrepancies in HIV prevalence estimates include different time periods of measurement, measurement errors for small sample sizes (particularly for smaller countries with low estimated HIV-prevalence among MSM, e.g. Bosnia-Herzegovina, Macedonia) and/or different recruitment methodologies (and therefore different sampling biases) between studies.

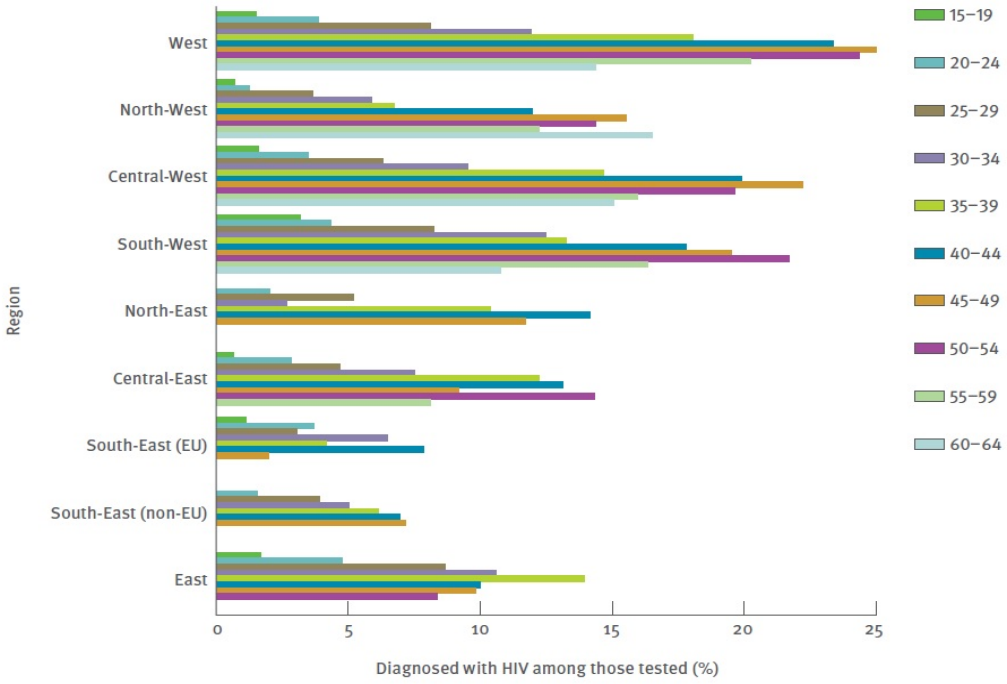
Estimates of HIV prevalence among MSM

In EMIS 2010, estimates of self-reported HIV prevalence (defined as the proportions of men diagnosed with HIV among those who reported ever having tested) ranged from 0% in Bosnia and Herzegovina to 19.9% in the Netherlands (see Table 2-1) (11). EMIS 2010 generally found higher self-reported HIV prevalence in Western compared to Eastern European countries, and this is to be expected given that the HIV epidemic

[10] The Dublin Declaration was adopted in 2004, and emphasises HIV as an important political priority in Europe and Central Asia. Signatory countries closely monitor, on a biannual basis, the implementation of actions taken to tackle HIV/AIDS in their country. Further details available at http://ecdc.europa.eu/en/healthtopics/aids/Pages/monitoring-dublin-declaration.aspx

started earlier in this region. Since HIV infection persists, and since people with HIV can have an almost normal life span if HIV replication is efficiently suppressed by antiretroviral therapy (ART), prevalence tends to increase in older age groups the longer the epidemic continues. In EMIS 2010, the highest self-reported HIV prevalences were generally in men aged 45-54 in the Western European sub-regions. However, in the Eastern European sub-regions, HIV prevalence tended to be highest among men in slightly younger age groups (see Figure 2-7), reflecting the younger epidemic in this region.

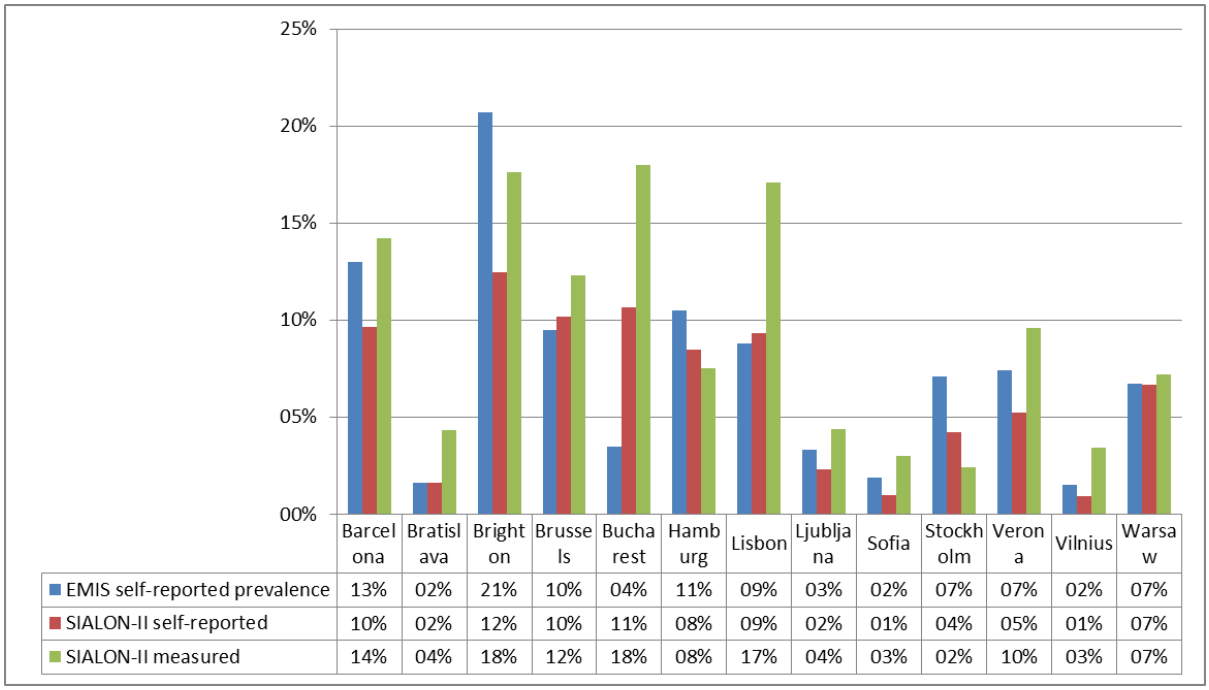
Figure 2-7 Self-reported HIV prevalence as reported in EMIS 2010, by age group and sub-region*



*Source: Reproduced from EMIS 2010 Technical report (11). List of countries contained within each sub-region provided in the Appendix. Age groups with n<50 are not shown.

Some more recent estimates of HIV prevalence among MSM in Europe come from the Sialon II bio-behavioural study (34) and from the 2016 round of Dublin Declaration monitoring (see Table 2-1). In the Sialon II study, *measured* HIV prevalence estimates (based on testing of oral fluid or blood samples) ranged from a minimum of 2.4% in Stockholm to a maximum of 18.0% in Bucharest, and in general tended to be higher in Western compared to Eastern European cities (with the exception of Bucharest (18%), where almost 40% of the participating sample reported injecting drug use). In four cities HIV prevalence was below 5% (Stockholm, Vilnius, Ljubljana, Bratislava) while five cities had an HIV prevalence of between 10% and 20% (Brussels, Barcelona, Lisbon, Brighton, Bucharest) (see Figure 2-8, which shows Sialon II data for both self-reported and measured HIV prevalence, and self-reported HIV prevalence data for relevant cities from EMIS 2010).

Figure 2-8 Self-reported and measured HIV prevalence in 13 European cities from EMIS 2010 and Sialon II studies*



	Barcelona	Bratislava	Brighton	Brussels	Bucharest	Hamburg	Lisbon	Ljubljana	Sofia	Stockholm	Verona	Vilnius	Warsaw
EMIS self-reported prevalence	13%	02%	21%	10%	04%	11%	09%	03%	02%	07%	07%	02%	07%
SIALON-II self-reported	10%	02%	12%	10%	11%	08%	09%	02%	01%	04%	05%	01%	07%
SIALON-II measured	14%	04%	18%	12%	18%	08%	17%	04%	03%	02%	10%	03%	07%

*Source: Reproduced from Sialon II project report (34).

In the Sialon II study, HIV prevalence tended to be higher in individuals aged 25 or older compared to those aged younger than 25. In this study, notable proportions of HIV-positive individuals were unaware of their HIV-positive status, ranging from 12.3% in Brussels to 88.4% in Sofia. The largest proportions of individuals who were unaware of their HIV infection were in Eastern European cities including Sofia (88.4%), Vilnius (59.2%) and Bratislava (51.8%) (34).

In the 2016 round of Dublin Declaration monitoring, HIV prevalence estimates were obtained from a variety of different studies using a variety of different methodologies, thus the estimates may not always be nationally representative. However, estimates ranged from <1% in some countries (e.g. Bosnia-Herzegovina - sample size of 2 342 men, and Bulgaria - sample size of 132 men), to >15% in France, Malta and Romania (see Table 2-1).

Table 2-1 Comparison of estimates of national MSM population sizes and HIV prevalence among MSM in European countries

	Estimates of national MSM population sizes		HIV Prevalence Estimates (%)			
	Marcus *et al*. BMC Public Health 2013[§]	2016 Dublin Declaration Monitoring*	EMIS 2010[¶]	HIV prevalence studies cited in Marcus *et al*. BMC Public Health 2012[Σ]	Sialon II[ʊ]	2016 Dublin Declaration Monitoring[Δ]
Austria	70,985	-	7.2	-		2 to 4
Belarus	*31,836*	×	3.0	2.7		×
Belgium	*106,336*	-	10.5	5.6	12.3	12.3
Bosnia & Herzegovina	26,044	6,900–9,500	0.0	0.7		0.6
Bulgaria	*26,341*	57,826	2.5	3.3	3	0
Croatia	29,497	30,000	4.8	3.3		2.8
Cyprus	6,954	-	1.9	-		1.9-2.5
Czech Republic	46,321	-	4.9	2.6		-
Denmark	*54,723*	50,000	12.0	4.9		4-5
Estonia	*9,195*	9,000	2.8	1.7		2-3
Finland	*53,118*	-	5.1	2.0		1.6
France	*626,948*	275,000	12.7	12.0		17.3
Germany	655,740	750,000	11.6	4.9	7.5	7.0 - 8.0
Greece	102,888	94,002	12.9	6.5		7.1
Hungary	53,404	-	5.6	2.7		11.0
Ireland	47,697	-	9.5	-		-
Italy	359,315	-	9.7	11.8	9.6	-
Latvia	12,880	-	7.8	4.0		-
Lithuania	17,760	-	4.8	2.7	3.4	2.7
Luxembourg	1,749	-	13.8	6.0		-
Macedonia	1,232	×	7.7	2.8		×
Malta	3,545	-	2.5	-		39.3
Moldova	15,853	13,500	4.3	4.8		5.4
Netherlands	111,072	230,000	19.9	6.0		α
Norway	*47,483*	-	5.2	3.3		-
Poland	*134,981*	331,000 (220,500-441,000)	8.3	4.7	7.2	2.3 (1.4-3.9)
Portugal	109,171	-	10.9	11.0	17.1	5.9
Romania	*74,916*	10,507	5.1	4.6	18	18.0
Russia	461,264	×	8.6	8.3		×
Serbia	36,944	55,447 (20,789-90,104)	5.4	3.6		8.3
Slovakia	*19,366*	-	2.2	6.1	4.3	α
Slovenia	*21,591*	-	5.1	5.1	4.4	4
Spain	294,028	890,235	12.2	17.0	14.2	11.3
Sweden	65,632	80,000-120,000	6.4	4	2.4	2
Switzerland	70,229	80,000	11.5	8.1		8
Turkey	*232,935*	-	3.0	-		-
Ukraine	*154,415*	175,750	8.2	6.4		8.5
United Kingdom	*613,658*	476,460 (402,530-552,812)[#]	14.6	5.3	17.6	4.9 (4.2-5.8)#

§ Calculated using data from EMIS 2010 and national statistics. *Italics are adjusted estimates (either 1% or 3% of the general male population aged 15-64), due to unreliable calculated estimates.*

***** Variety of methodologies used; - = no estimate provided; × = not included in 2016 Dublin Declaration reporting; # = 15-44 year olds.

¶ Self-reported HIV prevalence (number testing positive/number ever testing) among MSM at or over the age of consent

Σ Variety of methodologies used: directly measured or self-reported prevalence, or prevalence estimated using surveillance data and population-based modelling. - = no prevalence estimate available

ʊ Directly measured prevalence in 13 European cities.

Δ Variety of methodologies used; - = no estimate provided; × = not included in 2016 Dublin Declaration reporting; α = estimates for Netherlands (0.9%) and Slovakia (60-70%) appeared unlikely to be nationally representative and so are not presented; # = 15-44 year olds.

2.3 Trends in prevalence and incidence of other STIs

2.3.1 General overview – trends in bacterial STIs

During the decade between the recognition of HIV/AIDS in the mid-1980s and the mid-1990s, a long-term trend in Western Europe included steeply declining incidence of most bacterial STIs such as syphilis, chlamydia and gonorrhoea (35-38). This was largely due to behavioural change caused by fear of HIV and HIV-induced disease, including reductions in numbers of partners and increases in condom use, as well as the shrinking of core groups of MSM practicing condomless sex with multiple partners.

However, declining STI trends in Western Europe were reversed during the latter half of the 1990s (39). During this period, the availability of effective treatment for HIV meant that people were regaining health and living for longer, and numbers of sexual partners began to increase again (39). New risk management strategies, such as HIV serosorting (seeking HIV sero-concordant partners for condomless sex), also emerged in metropolitan areas with large numbers of HIV-infected men. The re-establishment of a pool of individuals with high partner change and declining condom use facilitated continuous circulation of sexually transmitted agents. Changing behaviours were not matched by timely implementation of adequate screening policies for STIs, which were only introduced into routine management of HIV infection with considerable time delays. Across European countries, there is currently large variability with regard to the extent and frequency of diagnostic procedures to detect sexually transmitted co-infections amongst MSM treated for HIV (see Chapter 4 for further details) (40). The conditions allowing for STI outbreaks or epidemic spread, in terms of the numbers of individuals involved in high-risk sexual networks, also vary considerably between countries.

In some Central and Eastern European countries increases in the incidence of STIs (particularly syphilis) occurred among the general population during the 1990s. This was as a result of profound political, social and economic change during the transition period after the breakdown of communist regimes in the region, including deteriorating access to healthcare and the emergence of a large criminalized commercial sex work sector, with limited access to adequate sexual healthcare (41). The STI epidemics spread primarily within the general heterosexual population, and in response STI control measures were intensified. These control measures, combined with the re-structuring of healthcare systems, helped to reduce STI incidence. However, STI incidences are probably still higher among commercial sex workers and among the general population in Eastern compared to Western Europe (41).

Data on the prevalence and incidence of bacterial STIs among MSM in many Eastern European countries are sparse, largely due to high stigmatization of homosexual behaviour. However, towards the end of the 1990s, legal and social changes in Central and Eastern European countries lead to improvements in opportunities for gay and bisexual men to meet and find new sexual partners. Gay subcultures slowly developed in some larger cities such as Warsaw, Prague, Budapest, St. Petersburg and Moscow. From 2000 onwards, opportunities for meeting new partners further improved with the emergence of online dating websites for gay and other MSM. In more recent years,

smartphone social and sexual networking applications for MSM have additionally improved opportunities for finding new partners.

2.3.2 Vaccine-preventable STIs and infections associated with occasional outbreaks

Across Europe, prevalence and incidence of vaccine-preventable viral STIs, such as hepatitis B virus (HBV) and human papilloma virus (HPV), are strongly determined by national vaccination policies and their practical implementation, as well as age, since vaccines have only been introduced in the last two decades (HBV) or even more recently (HPV). Data on vaccine-preventable viral STIs are presented in Sections 2.6 (HPV) and 2.7 (HBV) of this report.

Several bacterial and viral infections that are generally not regarded as primarily sexually transmitted may, under certain conditions, become sexually transmitted among MSM, or among specific sub-populations of MSM (e.g. hepatitis C, lymphogranuloma venereum, hepatitis A, shigellosis, invasive meningococcal disease – covered in Sections 2.8 to 2.12 below). Clusters of such infections are sometimes recognized as outbreaks but may often go unnoticed. Highly infectious enteric pathogens known to cause occasional outbreaks (e.g. hepatitis A virus, s*higella* species) are often shed from the rectal mucosa over prolonged periods by asymptomatic or recovered carriers. Settings prone to sustaining the transmission of such pathogens are gay sex venues, particularly if they provide opportunities for group sex and shared use of sex toys. Usually the numbers of individuals involved in such outbreaks are too small to capture large enough numbers of them in online surveys to perform meaningful analyses.

2.4 Syphilis

2.4.1 Syphilis incidence among MSM

Syphilis transmission is most effective in the presence of primary syphilitic ulcers and secondary mucocutaneous lesions. Early diagnosis is facilitated by the visibility of lesions in the genital area. While oral and perioral lesions can be relatively easily recognized (but also easily mis-diagnosed), typically painless intra-rectal lesions usually remain unnoticed. Thus, infections transmitted to insertive partners during oral and anal intercourse may be diagnosed as penile ulcers earlier than infections transmitted to receptive partners, particularly to anal receptive partners. Condomless anal intercourse is therefore associated with an increased risk for syphilis transmission, particularly within sexual networks where condomless anal sex with multiple partners is common. On the other hand, new infections can be detected by regular serological screening if people are in medical care, such as for HIV treatment, even if they cause no characteristic symptoms. Onward transmission of syphilis to new

partners can be effectively reduced if screening frequency is adapted to risk behaviour and partner numbers.

By sharing common modes of transmission, the prevalence and incidence of syphilis and HIV among MSM are highly associated. This association is further strengthened by immunological and biological factors. A recent history of syphilis is a strong independent risk factor for acquiring HIV infection, just as being diagnosed with HIV is a strong independent risk factor for syphilis infection (42).

Syphilis incidence among MSM declined to an all-time low in Western Europe in the mid-1990s, although localized outbreaks still occurred in larger cities in the late 1990s (such as in Hamburg in 1997) (43), and the proportion of HIV-positive men among syphilis patients was very high. More generalized spread of syphilis among MSM started from about 2000 onwards (15, 44, 45), fuelled by increases in partner numbers, and larger sexual networks facilitated by online social and sexual networking websites. After a four-to-five-year period of increasing syphilis incidence, this levelled off in many countries in the mid-2000s (45), as increasing awareness and improved testing strategies helped to control further spread. Increases in syphilis incidence among MSM in the UK and Germany from about 2010 onwards appear to be fuelled by increasing diversification of HIV risk reduction strategies, such as HIV serosorting, and declining rates of consistent condom use (4, 42). These behavioural changes have been mitigated, although not fully matched, by expansions and intensifications of testing policies. While syphilis screening rates among MSM treated for HIV infection have increased in recent years, several modelling studies suggest that screening intervals would need to be shortened to six or even three months among groups with high partner numbers to have an impact on the epidemic (46, 47).

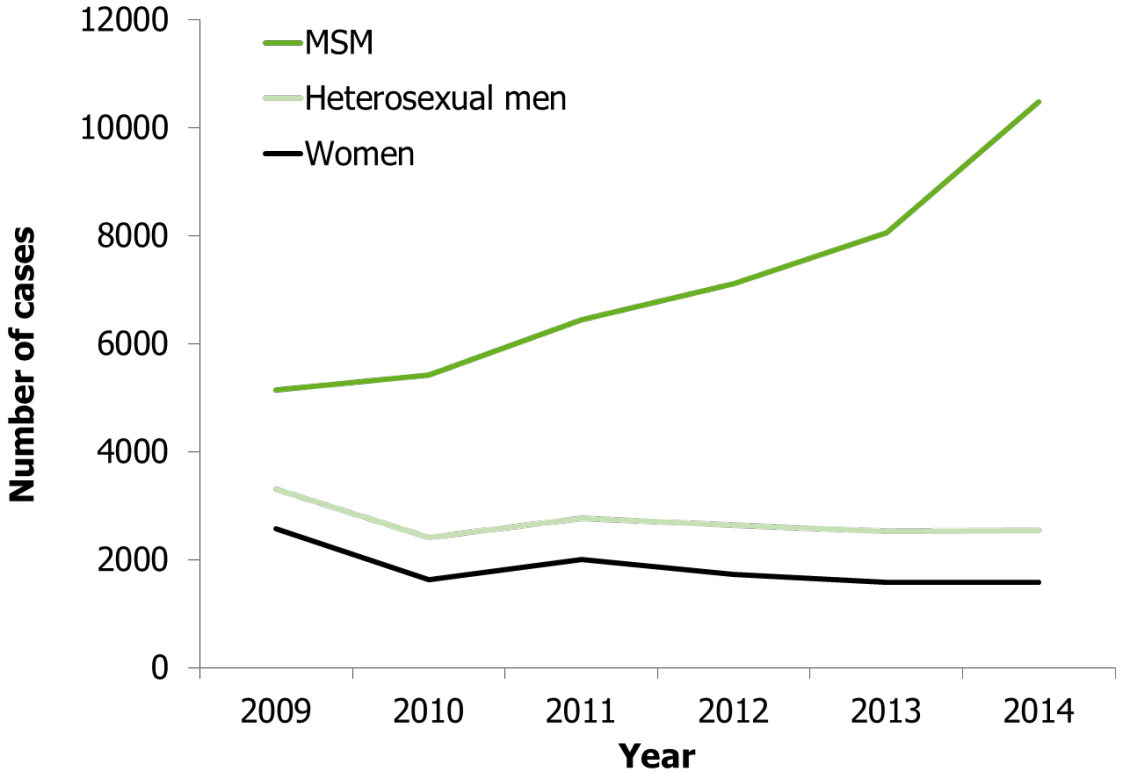
2.4.2 Syphilis trends among MSM between 2009 and 2014

Between 2009 and 2014, data on new syphilis diagnoses among MSM were available for 17 EU/EEA countries (5). These data show a steep increase in the number of reported cases among this group since 2010, while cases among heterosexual men and among women have remained stable (see Figure 2-8). In 2014, almost two-thirds (63%) of reported syphilis cases with information on transmission category were reported in MSM. The percentage of cases diagnosed in MSM ranged from below 10% in Romania and Slovakia to more than 70% in Denmark, France, the Netherlands, Norway and the UK (5). Overall in all reporting countries in 2014, reported syphilis rates were six times higher in men than in women, and the majority of cases were reported in people older than 25 years, with young people between 15 and 24 years of age accounting for only 13% of cases (5).

Figure 2-9 and Figure 2-10 below show rates of new syphilis diagnoses among MSM per 100,000 male population between 2009 and 2014 in Western (Figure 2-9) and Central and Eastern European countries (Figure 2-10). In most Western European countries, rates have increased over this period, most notably in Germany and the UK. Trends in the Central and Eastern European countries for whom data were available are diverse, being low and stable in Romania and Lithuania, increasing in Latvia, and

decreasing in Slovenia in recent years. In the EU/EEA as a whole, including countries for whom data were not broken down by transmission risk category, trends in rates of new syphilis diagnoses have increased since 2010 (all transmission risk groups), with diverging trends between genders: there has been a marked increase among men, but a decrease among women (5).

Figure 2-9 Number of confirmed syphilis cases by gender and transmission category, EU/EEA countries reporting consistently, 2009–2014*



Source: ECDC, Annual Epidemiological Report 2016 – Syphilis (5). Includes reports from: Cyprus, the Czech Republic, Denmark, France, Germany, Greece, Ireland, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Portugal, Romania, Slovenia, Sweden, the UK

Figure 2-10 Rates of newly reported syphilis cases among MSM, Western European countries, 2009-2014*

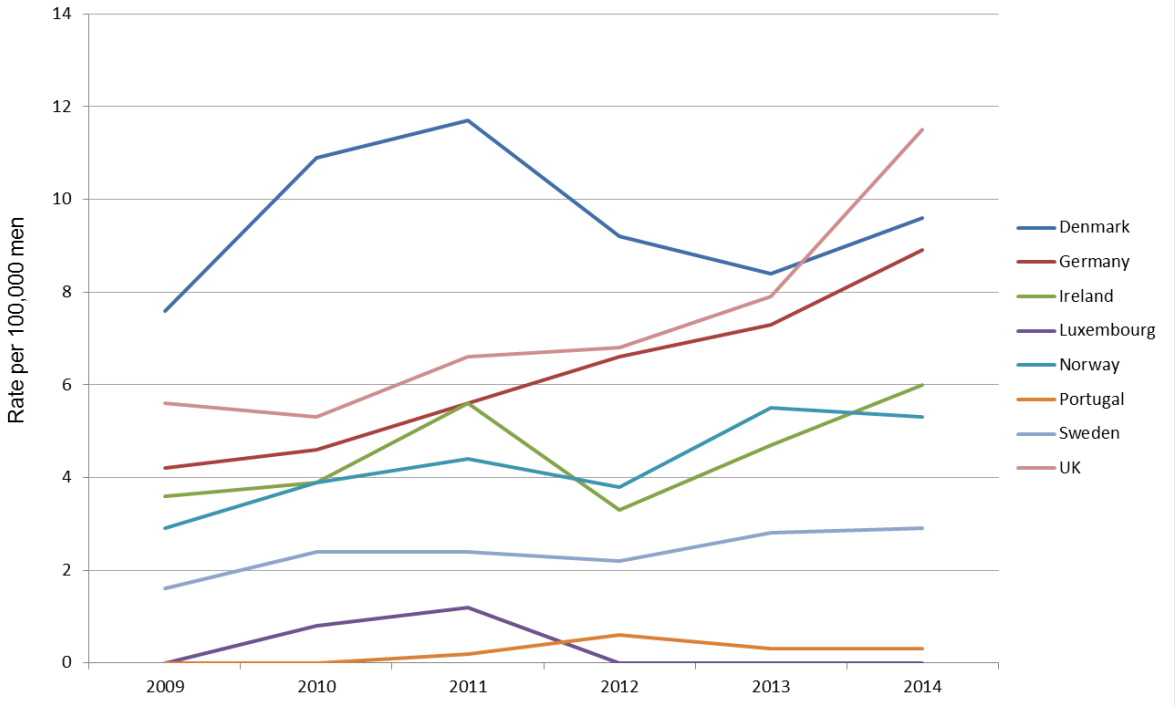
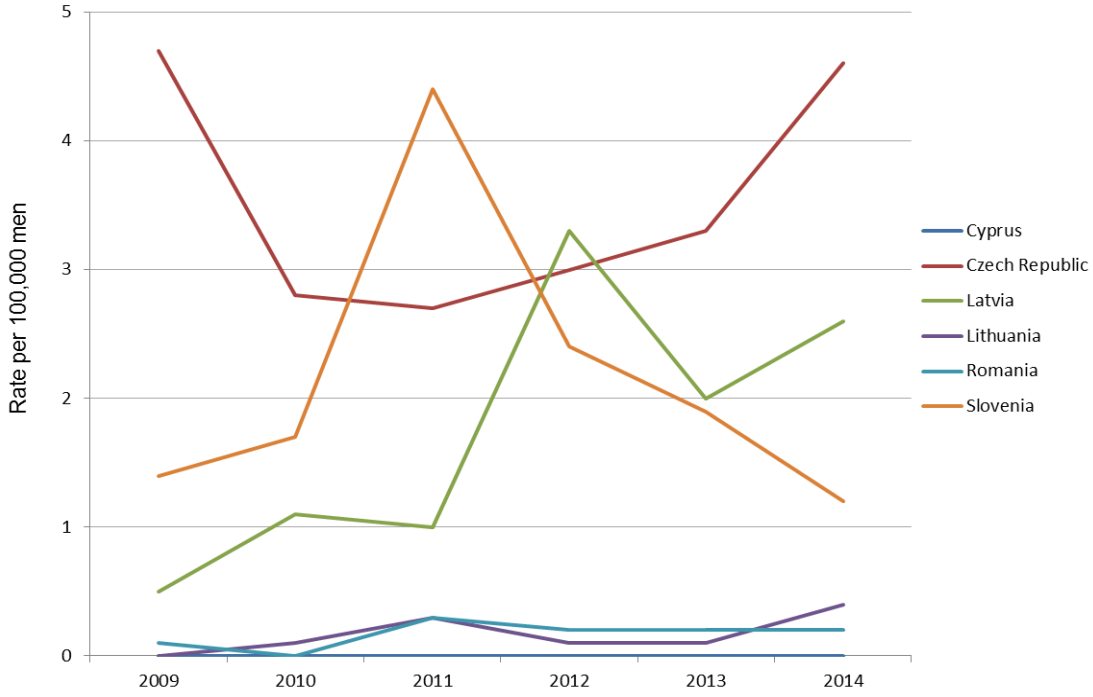


Figure 2-11 Rates of newly reported syphilis cases among MSM, Central and Eastern European countries, 2009-2014*



*Source of data: ECDC Surveillance Atlas of Infectious Diseases (http://ecdc.europa.eu/en/data-tools/atlas/Pages/atlas.aspx) (48)

2.4.3 Syphilis prevalence

Among an HIV-negative cohort of MSM recruited in Lisbon between 2011 and 2014, self-reported lifetime prevalence of syphilis infection was 7% (49). In the Sialon II study, syphilis markers were investigated in four European cities; the prevalence of active syphilis was 9.7% in Bucharest, 5.1% in Verona, 1.4% in Bratislava and 0.1% in Vilnius. In the same study, markers of prior syphilis infection were highest in Vilnius (10.5%) and lowest in Bratislava (3.3%) (34).

A study in Germany among 1 052 MSM seroconverting for HIV between 1996 and 2007 reported an overall syphilis prevalence of 26%, increasing from 10% between 1996-1999 to 35% in 2005 (50). Co-incident syphilis infection at HIV diagnosis increased significantly ($p<0.001$) from 2.3% in 2000 to 16.9% in 2003, declining thereafter to 4.3% in 2007. Another cohort study among HIV-positive MSM in Germany which collected data between 1996 and 2012 reported that syphilis prevalence at HIV-seroconversion was 27.1% (7).

2.5 Gonorrhoea and chlamydia

From very low levels in the mid-1990s, incidence of gonorrhoea and chlamydia increased among MSM in Western Europe in the late 1990s and early 2000s (44, 51, 52). This may have been partly due to improved sensitivity of diagnostic tests and the expanded use of combination diagnostic tests, in addition to behavioural changes such as increases in partner numbers and declines in condom use.

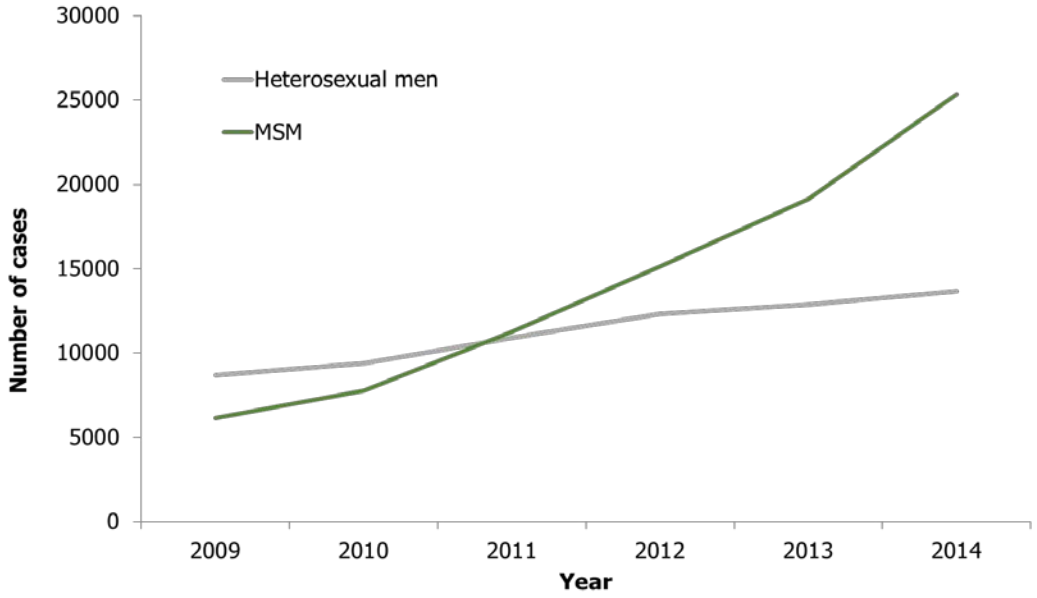
Many studies conducted in the last decade have convincingly demonstrated that the usual standard testing of urogenital sites for gonorrhoea and chlamydia misses most infections in MSM, which occur at extra-genital sites in the pharynx and rectum, and are mostly asymptomatic (53-55). While pharyngeal infections are self-limiting and usually clear within two to three weeks even without treatment (56), rectal infections can persist over longer periods, often without severe symptoms. Few European countries provide an infrastructure for routine screening of MSM in dedicated low-threshold testing sites, thus many MSM rely on general practitioners (GPs) for sexual healthcare, where they do not disclose their sexual preference and will therefore not be offered comprehensive three-site screening, even if this is recommended by guidelines (57, 58). Even if sexual preference is disclosed, comprehensive screening is less frequently initiated by GPs compared to at dedicated STI clinics, for various reasons. This results in very high levels of undiagnosed asymptomatic extra-genital infections among MSM (see also Chapter 4, Section 4.3.3). Improved testing at extra-genital sites, as well as increases in testing frequency, could easily result in a doubling or tripling of the number of diagnoses among MSM, without any changes in infection incidence (59). As a result, data on trends in gonorrhoea and chlamydia diagnoses are difficult to interpret without additional information on testing frequency, as well as on testing policies and practices, such as the anatomical sites tested, and whether testing was part of routine screening or was symptom-driven.

2.5.1 Trends in reported cases of gonorrhoea between 1998 and 2014

Surveillance data on gonorrhoea infections among MSM in 10 European countries between 1998 and 2007, collated and analysed by the European Surveillance of Sexually Transmitted Infections (ESSTI) network, showed that the number of cases rose in most Western European countries over this period (with the exception of Italy), whilst cases remained fairly steady in Central Europe and the rate fell considerably in Eastern Europe, by 89% and 46% in Estonia and Latvia respectively (44).

In more recent data published by the ECDC (6), the overall rate of reported gonorrhoea cases between 2005 and 2014 (all transmission risk groups, in 29 European countries) initially decreased from 9 per 100,000 population in 2005 to 8 per 100,000 population in 2008. However, between 2009 and 2014 there was a marked increase, reaching 20 cases per 100,000 persons in 2014. Rates among men were consistently higher than those among women. Data disaggregated by risk group for the period 2009 to 2014 showed that while case numbers increased among both heterosexual men and MSM, the increase was most marked among MSM (Figure 2-11). This could be partly as a result of increased testing of MSM, particularly at extra-genital sites, as well as the more widespread use of nucleic acid amplification tests.

Figure 2-12 Number of confirmed gonorrhoea cases among men by transmission risk group, EU/EEA countries reporting consistently 2009–2014*



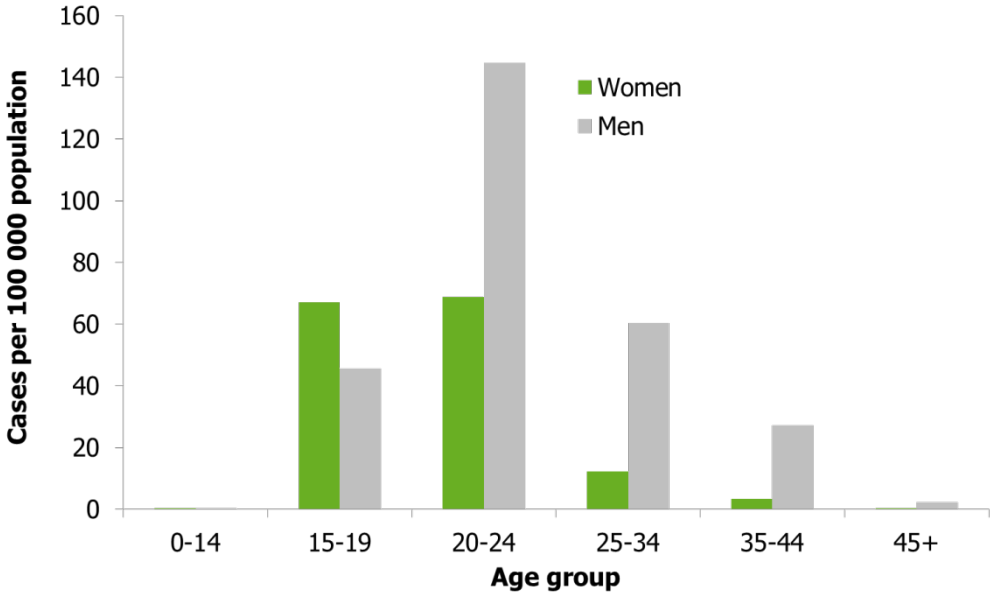
*Includes country reports from: Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Greece, Ireland, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Portugal, Romania, Slovakia, Slovenia, Sweden, UK. Source: ECDC, Annual Epidemiological Report 2016 – Gonorrhoea (6)

In 2014, 15 countries (accounting for 85% of all reported gonorrhoea cases) provided information on mode of transmission for 60% or more of their cases. In 49% of cases the transmission category was reported as heterosexual; in 44% of cases it was reported as MSM, and for 7% of cases the transmission risk group was reported as unknown (6). Cases diagnosed in MSM represented 65% of all male cases diagnosed in these 15 countries in 2014. The percentage of cases diagnosed among MSM ranged from 10% or less in Estonia, Latvia, Lithuania, Romania and Slovakia to over 50% in Norway, Malta and France.

Data on the HIV status of cases were provided by nine countries in 2014, representing 81% of all reported cases. This revealed that 11% of cases were HIV positive (either known or newly diagnosed), 62% were HIV negative, and information on HIV status was not available for 27%. Among the MSM risk group, 24% were HIV positive, 63% were HIV negative, and information on HIV status was not available for 13% (6).

Data on age for reported gonorrhoea cases in 2014 (all transmission risk groups) were reported by 23 countries. Rates among males where higher than rates among females in all age groups 20 years and older. The highest age and gender specific rates were among males aged 20–24 years (145 per 100,000) (see Figure 2-12).

Figure 2-13 Rate of confirmed gonorrhoea cases (all transmission risk groups), by age and gender, EU/EEA, 2014*



*Includes country reports from: Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Greece, Hungary, Iceland, Ireland, Latvia, Lithuania, Luxembourg, Malta, Norway, Portugal, Romania, Slovakia, Slovenia, Sweden, UK. Source: ECDC, Annual Epidemiological Report 2016 – Gonorrhoea (6)

2.5.2 Estimates of prevalence of gonorrhoea among MSM

Studies conducted in Western European countries have reported the following pharyngeal prevalences of gonorrhoea*:* 4.2% among MSM attending an STI clinic in the Hague (60), 5.5% among MSM attending sentinel STI sites (local health offices, STI clinics, private practitioners) in 16 German cities (61), and 9.5% among HIV-positive MSM attending a university hospital outpatient clinic in Madrid (62). The studies in the Hague and Germany reported rectal prevalence of gonorrhoea to be 6% and 4.6% respectively, while the study in the Hague reported urethal prevalence to be 2.8%. One study among MSM attending a genitourinary medicine (GUM) clinic in inner London between 1999 and 2001 reported urethral, pharyngeal and rectal prevalence of gonorhoea to be similar at 7.2%, 7.3% and 7.3% respectively (63).

2.5.3 Chlamydia diagnoses in Europe

Information on transmission risk group for chlamydia notifications in the EU/EEA is poor (available for just 40% of reported cases in 2014) (64). Where information on transmission risk group was available, in 2014 the majority of cases (87%) occurred in heterosexuals, with 7% of notifications being among MSM, and 6% of cases reported as unknown. The male-to-female ratio of chlamydia notifications in 23 EU/EEA countries in 2014 was 0.7:1. The largest proportion of cases was reported among 20–24 year-olds (39% of cases) with the second largest proportion among 25–34 year olds (25% of cases). The highest overall notification rates were reported among women aged 20 to 24 years (1,144 cases per 100,000 persons) and women aged 15 to 19 years (1,026 per 100,000 persons). This likely reflects the emphasis of clinicians on the diagnosis of chlamydia among women, where reproductive tract complications have significant public health impact. In 2014 chlamydia notification rates among men were highest among 20–24-year-olds (683 per 100,000 persons).

In 2014, 83% of all chlamydia cases (all transmission risk categories) were reported in four countries (Denmark, Norway, Sweden and the UK). The UK continues to contribute a large proportion of reported cases (60% in 2014) due to the inclusion of data from a chlamydia screening programme targeted at 15–24-year-olds which has been in operation in England since 2008, and has resulted in large numbers of diagnoses. All countries with high chlamydia notification rates (>200 per 100,000 population) had control strategies recommending either active screening (UK – England) or widespread opportunistic testing (Denmark, Finland, Iceland, Norway, Sweden and the rest of the UK). Rates below 10 per 100,000 were reported by seven countries (Bulgaria, Croatia, Cyprus, Greece, Luxembourg, Poland and Romania). Large differences in reported notification rates between countries are likely related to variation in the availability of diagnostics, surveillance strategies, the degree of underreporting, and testing policies and the degree of their effective implementation.

2.5.4 Trends in chlamydia notifications between 2005 and 2014

The overall chlamydia notification rate among 27 European countries (all transmission risk categories) increased from 165 cases per 100,000 in 2005 to 189 per 100,000 in 2009. The overall rate of newly reported cases remained relatively stable between 2010 and 2014, although country-specific trends varied. Some countries with lower chlamydia notification rates (e.g. Bulgaria, Latvia, Slovakia, Slovenia) reported increases of over 50%, while the countries with the highest chlamydia notification rates (e.g. Denmark, Finland, Norway, Sweden, United Kingdom) reported stable trends, and some countries with low chlamydia notification rates (e.g. Greece, Iceland, Malta, Poland, Romania) reported decreasing trends (64).

A small number of countries reported rates of new chlamydia notifications among MSM between 2009 and 2014 (Figure 2-13 and Figure 2-14). However, data should be interpreted with caution, as levels of incompleteness of reporting of transmission risk category are high. Overall, notification rates among MSM were much lower than for all transmission risk groups combined. Countries with low but increasing notification rates among MSM between 2010 and 2014 included Latvia and Slovenia. The UK had the highest notification rate among MSM, increasing from 14.2 per 100,000 men in 2009 to 36.2 per 100,000 men in 2014.

Figure 2-14 Rates of new chlamydia diagnoses among MSM - countries with notification rates 5 per 100,000 or greater*

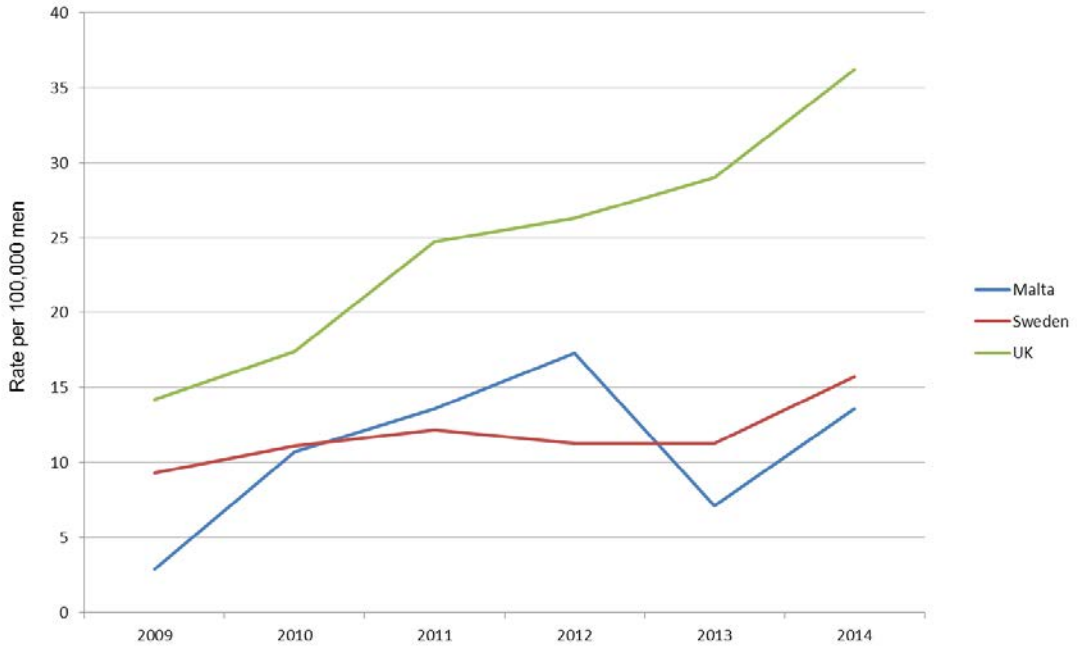
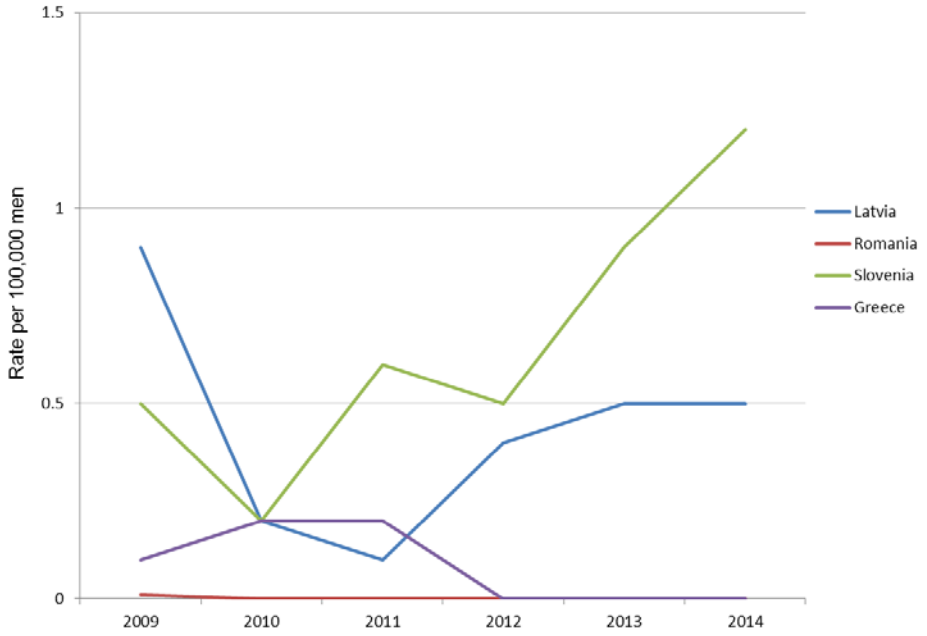


Figure 2-15 Rates of new chlamydia diagnoses among MSM - countries with notification rates ~1 per 100,000*



*Source of data: ECDC Surveillance Atlas of Infectious Diseases (http://ecdc.europa.eu/en/data-tools/atlas/Pages/atlas.aspx) (48)

2.5.5 Estimates of chlamydia prevalence among MSM

Among MSM populations, studies in Germany (61), the Netherlands (60) and the UK (63) have reported similar pharyngeal prevalences of chlamydia at 1.5%, 1.5% and 1.2%, respectively. In the same studies, rectal prevalence was higher at 8.0%, 8.2% and 6.5%, respectively. The Dutch and British studies additionally reported urethral prevalence of chlamydia to be 4.0% and 4.3%, respectively.

2.6 Human papilloma virus (HPV)

Very few epidemiological data are available on HPV at European level. The major burden of infection is cervical disease among women, however the virus is also associated with other morbidities affecting both men and women such as anogenital warts and anal and oropharyngeal cancers (65). There is very high incidence and prevalence of HPV among sexually active MSM (66, 67). Despite this, very few European countries have so far included MSM or male adolescents in their HPV vaccination strategies. Boys are routinely vaccinated against HPV in some countries such as Australia and the US. In the EU, only Austria recommends that both boys and girls should be vaccinated (65). Follow-up data from ongoing studies of HPV in boys and men will help to explore new vaccination strategies, and might change future recommendations regarding HPV vaccination in Europe.

Anal HPV infection (which can lead to anal squamous cell cancer or ASCC) is nearly universal among HIV-infected MSM, and high-grade anal intraepithelial neoplasia, the precursor for ASCC, is present in about 30 % of HIV-positive MSM (68). Age-adjusted incidence rates for anal cancer have increased in Western countries in recent decades, up to 2.2% per year, and infection with HPV is the most important aetiological factor (69). Besides increasing age, risk factors include receptive anal intercourse and being HIV-positive. The increasing incidence of anal cancer in recent decades can be partially explained by an increase in the absolute number of HIV-positive MSM (69).

2.7 Hepatitis B virus (HBV)

Hepatitis B virus (HBV) is a potentially life-threatening liver infection. Globally, the endemicity of HBV differs by geographical region. In high and intermediate endemic countries (countries in sub-Saharan Africa, South America, East Asia) HBV transmission occurs mainly perinatally or in early childhood, whereas in low-endemic areas (Western Europe, North America) HBV is more often contracted later in life, either through sexual contact or use of contaminated needles (70). In 1982 a safe, effective vaccine became available, and many countries have since implemented a national infant immunisation programme.

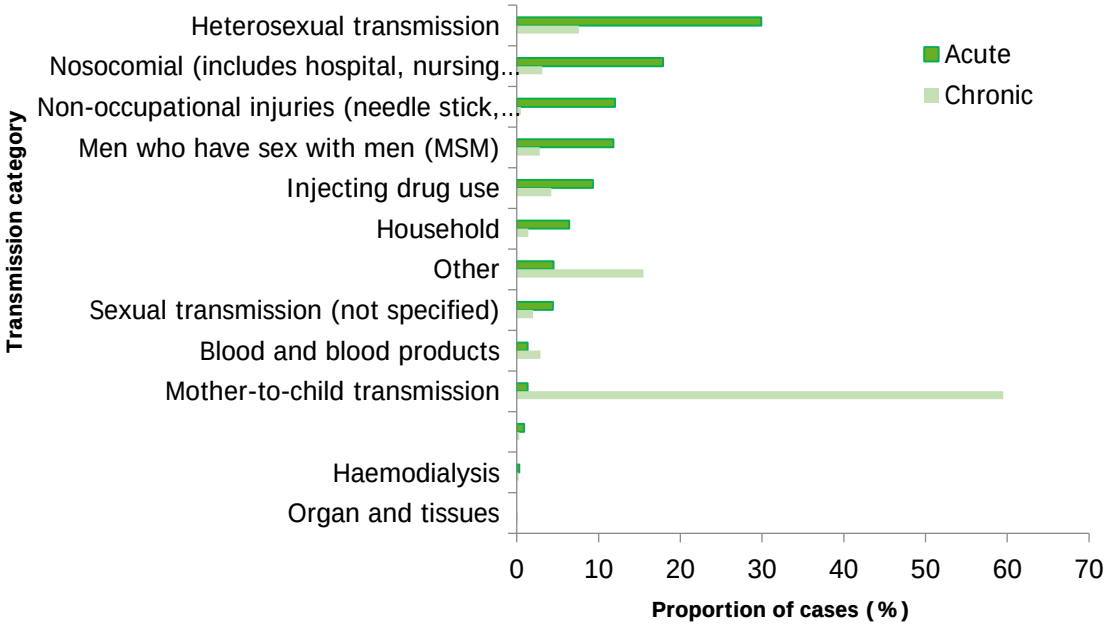
2.7.1 Epidemiology of HBV in Europe

According to data published by the ECDC, in 2014 high numbers of HBV infections were reported across Europe (all transmission risk groups), with the majority of these classified as chronic infections (71). The reporting rate for acute HBV (0.6 per 100,000 in 2014) has shown a steady decline since 2006 (1.3 per 100,000), most likely related to the impact of national vaccination programmes. Among acute cases, the most commonly reported routes of transmission were heterosexual transmission (29.9%), nosocomial transmission (17.9%), non-occupational injury (12.0%), transmission among MSM (11.8%) and transmission through IDU (9.3%) (see Figure 2-15). Mother-to-child transmission was the most common route of transmission among reported chronic cases (Figure 2-15). However, the reporting of transmission risk category is vastly incomplete (reported for only 10.4% of all HBV cases reported to the ECDC in 2014). A large proportion of chronic HBV infections in some northern European countries (e.g. Norway, Sweden) were classified as imported, likely as a result of migrants arriving from countries with endemic or high HBV prevalence.

In the EU/EEA in 2014, 12,284 cases of hepatitis B were reported in males (5.1 per 100,000) and 8 334 cases were reported in females (3.3 per 100,000). This represents a male-to-female ratio of 1.5 to 1. The male-to-female ratio was higher among acute cases (2.2 to 1) than among chronic cases (1.4 to 1). One third of all cases (33.8%) were in the 25–34-year age group, and the proportion of cases aged under 25 declined between 2006 and 2014. Among acute cases, the age distribution among male and female cases was similar, although for all age categories above 25 years the rates were higher among males than females (Figure 2-16). Higher infection rates among males may be due to transmissions among MSM as well as due to higher proportions of males among IDUs.

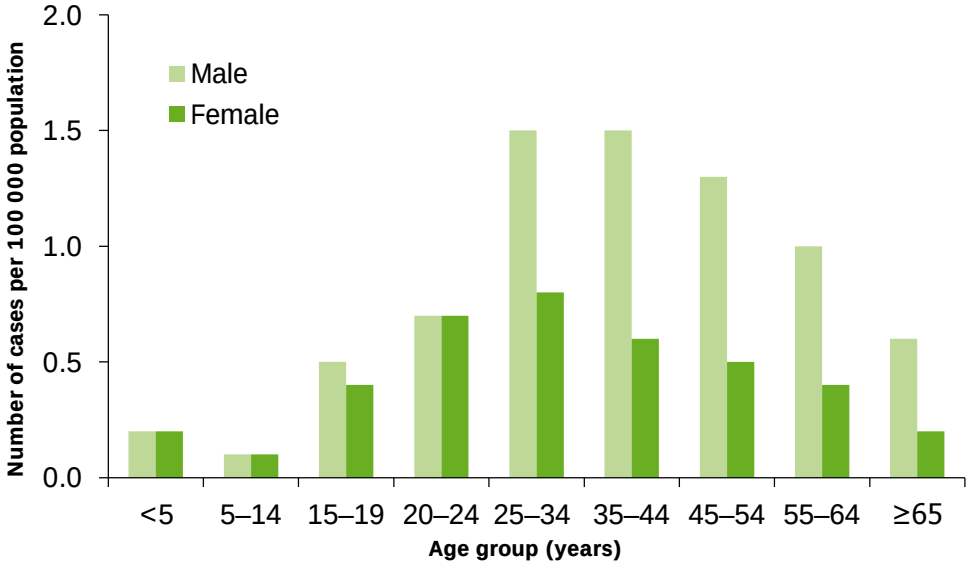
Estimates of HBV prevalence among MSM in the EU/EEA were collated in a systematic review published in 2016 (72). Estimates were available for four countries in total. This included Estonia (two separate estimates: 0% and 1%), the UK (two separate estimates, also 0% and 1%), Croatia (0.6%) and France (1.4%). All studies were based on convenience sampling.

Figure 2-16 Transmission category of hepatitis B cases by acute and chronic disease status, EU/EEA, 2014*



*Among cases where transmission status is known. Includes reports from Austria, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Lithuania, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Sweden, and the United Kingdom (excluding Scotland).
Source: ECDC 2016, Annual Epidemiological Report: Hepatitis B (71).

Figure 2-17 Rate of reported acute HBV cases by age group and gender, EU/EEA 2014*



*Underreporting of acute hepatitis B in France was estimated at 76.5% in 2013. Includes country reports from Austria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France**, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, and the United Kingdom (excluding Scotland).
Source: ECDC 2016, Annual Epidemiological Report: Hepatitis B (71).

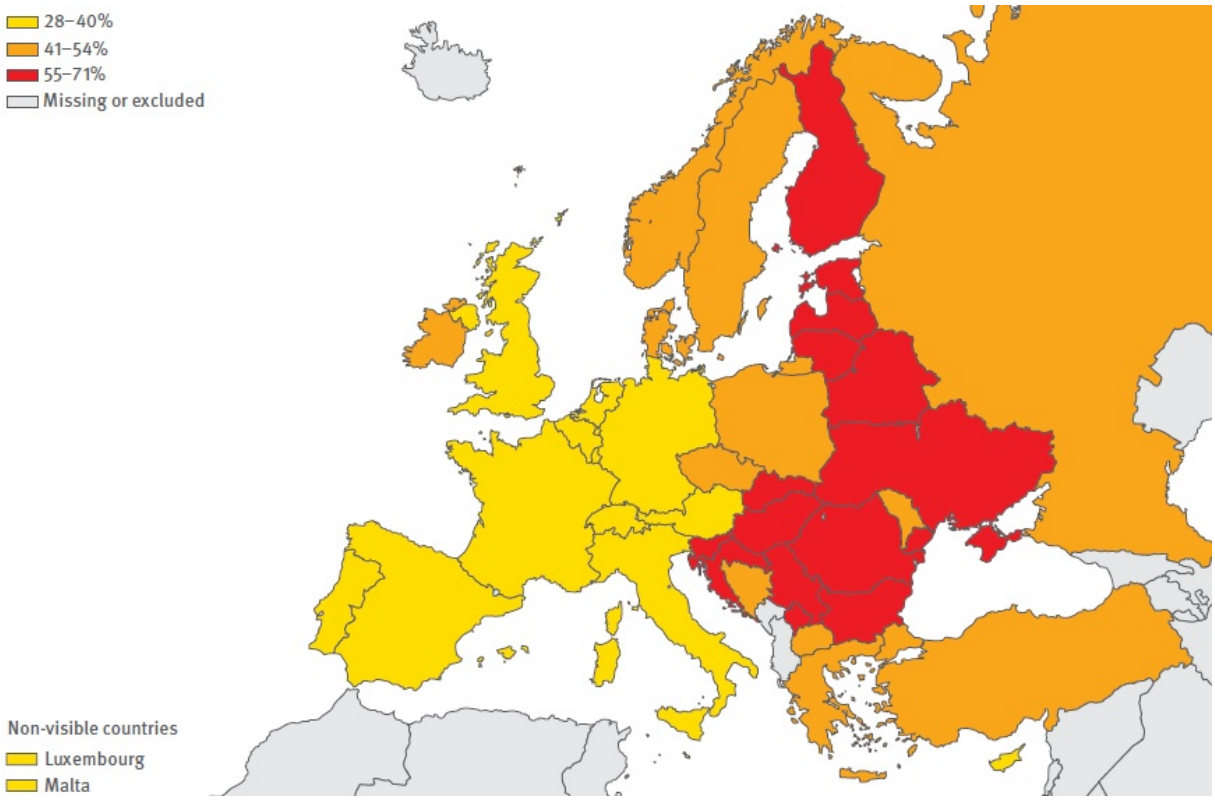
2.7.2 HBV among MSM

Patterns of HBV spread among MSM are influenced by national vaccination strategies. A combination of general childhood vaccination with additional vaccination in high-risk groups such as MSM and IDU is potentially the most effective strategy. However, risk group vaccination strategies are sometimes neglected when general childhood vaccination is implemented. Furthermore, risk group vaccination is less effective in reaching young MSM, MSM in rural areas, and MSM without gay identity.

In the Netherlands, HBV vaccination for MSM was introduced nationally in 2002. One study conducted in three regions of the country between 2004 and 2006 estimated vaccine coverage amongst MSM at 50% (73). Another study among MSM in Amsterdam in 2011 estimated vaccine coverage at 30%-38%, depending upon the proportion of MSM already immune as a result of prior infection (70). Compliance with the three-dose schedule of the vaccine was reported as 84% and 71% in these two studies, respectively. In the three region study, 74% of participants reported that they were aware of the opportunity to obtain free HBV vaccination. The most important reason for non-participation in the vaccination programme was a low perceived risk of infection, while a personal approach by STI-prevention workers, the recruitment region and having sex with casual partners were positively associated with vaccination uptake (73). In the study conducted in Amsterdam, incidence of acute HBV dropped sharply between 2005 and 2011, and mathematical modelling revealed that vaccination of those who engaged most in high-risk sex was most likely to have explained the decline in incidence (70). This suggests that vaccination programmes may be effective when the most high-risk individuals are reached, i.e. full vaccination coverage may not be required in order to interrupt transmission.

In analyses of EMIS 2010 data, an indicator estimating unmet need for HBV vaccination was calculated. This suggested that across Europe, a median of 50% of MSM were in need of HBV vaccination. A clear pattern of higher unmet need in Eastern European countries was evident (Figure 2-17). Estimates of unmet need for HBV vaccination ranged from less than 40% in West (except Ireland), Central-West and South-West Europe (except Greece) (see the Appendix for a list of countries included in each of the EMIS sub-regions), to more than 60% in Estonia, Slovakia, Slovenia, Ukraine, Bulgaria, and Serbia, and more than 70% in Lithuania (11). In the Sialon II study, HBV serostatus was investigated in four European cities (Bratislava, Bucharest, Verona, Vilnius). Verona had the highest proportion of participants (44.9%) indicating immunity to HBV most likely as a result of vaccination; the corresponding proportions estimated as vaccinated against HBV in Bratislava, Bucharest and Vilnius were 26.0%, 23.7% and 22.4% respectively (34). The higher estimated vaccination coverage in Verona is expected given an earlier HBV vaccination programme in Italy compared to the other countries. Among non-vaccinated individuals, prevalence of acute or chronic HBV was highest among participants in Bucharest (6.8% - likely associated with the high proportion of IDU recruited) and lowest in Bratislava, Verona and Vilnius (prevalences of 2.2%, 2.8% and 3.6% respectively) (34).

Figure 2-18 Proportion of EMIS 2010 respondents in need of hepatitis B vaccination*



*Reproduced from EMIS 2010 Technical Report (11)

2.8 Hepatitis C virus (HCV)

Hepatitis C is a liver disease caused by infection with the hepatitis C virus (HCV). HCV can cause both acute and chronic hepatitis infection, ranging in severity from a mild illness that lasts only a few weeks to a serious, lifelong illness resulting in cirrhosis and liver cancer. The virus is mainly acquired by contact through broken skin with infectious blood. In Europe, the main route of HCV transmission is via IDU as a result of sharing contaminated needles (74).

The virus is more rarely transmitted sexually, however since 2000 there is growing evidence that HCV has emerged as an STI among HIV-positive MSM (8, 75). During the last decade and a half, HCV prevalence has increased among HIV-positive MSM, with one study at an outpatient STI clinic in Amsterdam reporting a rise in prevalence among HIV-positive MSM from 5.6% in 1995 to a peak of 20.9% in 2008 (76). Other studies in Europe and elsewhere have similarly reported increases in HCV prevalence among HIV-positive MSM over similar periods of time (7, 77, 78).

The sexual routes of HCV transmission seem to be different to the transmission routes of other STIs, and recent evidence suggests that sexual practices associated with bleeding may explain the current epidemic among non-IDU HIV-positive MSM (79).

Apart from HIV-positivity, other reported risk factors include engaging in traumatic sex practices such as fisting, the use of sex toys, group sex, having multiple sex partners, co-infection with ulcerative STIs, and HIV serosorting (76, 80, 81). Evidence supports clustered outbreaks among high-risk sub-groups. One international molecular phylogenetic study revealed a large international, inter-linked network of HCV transmission among HIV-positive MSM in England, the Netherlands, France, Germany and Australia. In this study, a large proportion of the European MSM (74%) were infected with an HCV strain co-circulating in multiple countries. Spread between countries was further supported by the low evolutionary distances among HCV isolates from different countries, as well as the trend toward increased country mixing with increasing cluster size (82).

In EMIS 2010, a history of HCV (defined as ever having been diagnosed with HCV) among HIV-positive MSM with no history of IDU ranged between approximately 2% in the Central-East (Czech Republic, Hungary, Poland, Slovenia, Slovakia) and South-East EU (Bulgaria, Cyprus, Romania, Malta) regions, and 7.3% and 7.5% in the Central-West (Austria, Switzerland, Germany, Luxembourg) and West (Belgium, France, Republic of Ireland, Netherlands, UK) regions respectively. In the Sialon II study, the prevalence of anti-HCV among MSM was reported for four cities (but not disaggregated by HIV-status), being lowest in Vilnius and Bratislava (0.9% and 1.4% respectively), and highest in Verona and Bucharest (5.3% and 22.8% respectively) (34). The increased HCV prevalence in Verona is likely due to high background prevalence in the general population, while high levels in Bucharest are probably associated with the high proportion of IDUs recruited in this city. In Verona and Bucharest, individuals aged 25 and older showed a higher anti-HCV prevalence compared to those aged younger than 25 (Verona: anti-HCV prevalence in men aged <25: 1.4%, aged ≥25: 7.0%. Corresponding figures for Bucharest: aged <25: 11.8%, aged ≥25: 25.5%). The prevalence of HIV-HCV coinfections was 2.7% in Verona and 8.6% in Bucharest (no HIV-HCV coinfections among participants in Vilnius or Bratislava).

2.9 Lymphogranuloma venereum (LGV)

Lymphogranuloma venereum (LGV) is an STI caused by the invasive L serovars of *Chlamydia trachomatis*. An outbreak among MSM was first reported in the Netherlands in 2003 (9), and LGV outbreaks in MSM have since been reported in a number of Western European countries, with HIV co-infection being a common feature (83-85). Most reported infections are rectal, and the most common presentation is proctitis associated with rectal pain, discharge and bleeding. Early diagnosis is important to prevent irreversible complications and to stop further transmission in the community. In contrast to earlier reports, approximately 25% of LGV infections are asymptomatic, and thus form an easily missed undetected reservoir (86).

2.9.1 Epidemiology of LGV in the EU/EEA

In 2014, 21 EU/EEA countries provided data on reported cases of LGV (87). Eleven countries reported a total of 1,416 cases, while the remaining 10 countries reported no cases. The number of reported cases is an underestimate because many countries do not routinely report LGV, and diagnosis requires confirmation through genotyping. Different, and at times insufficient, testing strategies fail to detect a substantial number of asymptomatic cases (88), or cases are reported as “normal” chlamydia infections in the absence of strain typing.

In 2014, transmission category was reported for 889 LGV cases (63% of all reported cases); in all but four cases this was reported to be MSM. Information on HIV status was available for 1,354 LGV cases (96% of all cases), of whom 54% were reported as HIV positive, 8% as HIV negative and 38% as unknown. Of cases with known HIV status, 87% were HIV positive. Thus LGV infections are highly concentrated among MSM living with HIV, and evidence suggests that recent increases in cases are as a result of transmission within this group (89-91).

Compared with 2013, the number of LGV cases reported in 2014 increased by 32%; all countries except Finland, Italy and Malta reported an increase in case numbers (87). The largest proportional increase was reported in Ireland (six-fold) and the Czech Republic (1.5-fold). Between 2005 and 2014, 6,303 cases of LGV were reported in 12 countries, with the majority of cases reported in the UK (53%; 3,367 cases), France (20%; 1,276 cases) and the Netherlands (16%; 1,023 cases).

2.10 Hepatitis A virus (HAV)

Hepatitis A virus (HAV) is an acute, usually self-limiting enteric infection. The infection is asymptomatic or mild in children but often symptomatic in adults, who may develop jaundice and present with more severe clinical symptoms. No specific treatment is available, although inactivated vaccines are available for prevention. Transmission is predominately by the faecal-oral route, through contaminated water or food-products and/or by person-to-person contact (92). However, sporadic outbreaks among MSM with transmission through sexual exposure have been recognised since the 1970s (93-96). Several multinational outbreaks have been described, one of which involved at least eight cities across three countries and two continents, North America and Australia, and occurred from January through June 1991 (97). Several European countries have reported national outbreaks in MSM, with the main risk factor related to direct faecal-oral contact during sex (98-101).

In 2016, a number of clusters of HAV infection with similar genetic profiles were reported in several EU countries (the UK, Ireland, Sweden, Luxembourg, the Netherlands), with most cases occurring among MSM (102). A further three countries (Italy, Spain, Germany) also reported increases in cases of HAV among MSM or the male population in 2016. Clusters of cases in time and place, along with similar or identical viral sequences, suggest multiple outbreaks among MSM with transmission via the sexual route. Groups most at risk are those participating in higher risk sexual

practices and their contacts. Mass gathering events related to this specific population group (e.g. gay pride events) may increase transmission opportunities.

For those MSM most at risk, educational efforts should emphasise the importance of preventive vaccination and of personal hygiene (i.e. washing anal area, washing hands before and after sex, especially if practicing oral-anal sex or oral stimulation of the anus (analingus or 'rimming'), or fingering and fisting), and repeating messages regarding condom use for anal sex. Latex gloves offer some protection if practicing fingering or fisting. Outside of outbreak situations, ECDC guidance for HIV and STI prevention among MSM encourages Member States to promote and deliver vaccination against hepatitis A (102).

2.11 Shigellosis

Shigella species are highly infectious enteral pathogens usually causing severe diarrhoea. While symptomatic, most people will likely refrain from sexual contacts. If symptoms are only mild or after the resolution of symptoms, *Shigella* can sometimes be shed from the rectal mucosa over prolonged periods, particularly from people with HIV co-infection. Transmission may involve direct and indirect oral-anal contact, or anal-to-anal transmission via fomites (e.g. sex toys). Subgroups of MSM frequently engaging in such practices, e.g. when attending public or private sex parties, are vulnerable to sexually transmitted outbreaks. Cities with large MSM communities are prone to outbreaks, because a certain threshold in terms of numbers of individuals involved in sexual networks is required to maintain continuous circulation of the pathogen.

2.11.1 Shigellosis in the UK

In the past, *Shigella* infections in adults in the UK were primarily associated with travel to low-income countries, with endemic transmission due to poor sanitation. However, there has been a change in the epidemiology of shigellosis since 2009, marked by the emergence of an outbreak of *Shigella flexneri* 3a among MSM, which is thought to be associated with sexual transmission. Recent national surveillance data suggest intensification of *Shigella* transmission among MSM since 2009. The emergence of three distinct outbreaks caused by *S. flexneri* 3a, *S. flexneri* 2a, and *S. sonnei* has suggested at least three separate introductions of this pathogen into the MSM population over the past decade (103). These outbreaks have coincided with increased diagnoses of gonorrhoea, LGV, syphilis and a recent cluster of verotoxin-producing *Escherichia coli* 0117:H7 among MSM, particularly in those co-infected with HIV.

A national outbreak and investigation of *S. flexneri* 3a occurring in MSM between 2009 and 2011 reported that most cases were among white UK-born MSM. Many were HIV-positive, and they reported being part of dense sexual networks involving high numbers of casual and regular partners (104). This outbreak was associated with (i) low awareness about the risk of enteric infections, (ii) chemsex (sexual activity while

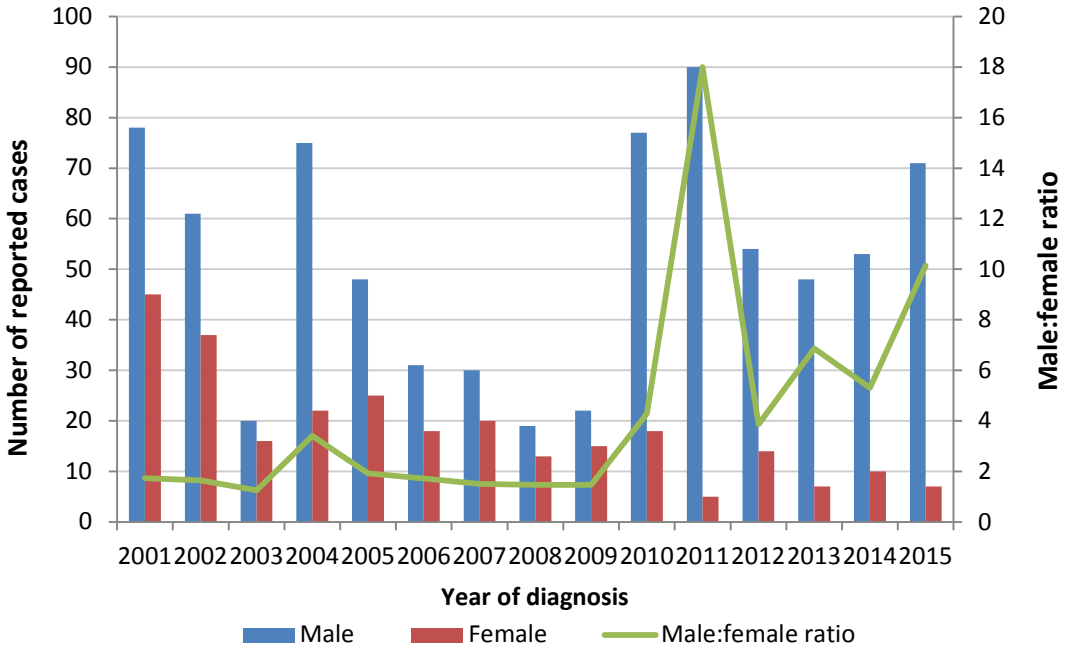
under the influence of stimulant drugs), and (iii) meeting sex partners and locating sex parties through social and sexual networking applications (iv) condomless sex.

The use of whole genome sequencing on *Shigella* isolates was introduced in the UK in 2015, which led to the identification of clusters of genetically similar infections. In late 2015 a number of clusters of *S. sonnei* were identified within adult males with no travel history, all of which had specific antibiotic resistance profiles (103). Further investigation into one of these clusters, centred in London, revealed that a number of cases occurred among MSM who reported a variety of high risk sexual practices during the incubation period, and who had low awareness of *Shigella*. The *S. sonnei* in this cluster had high levels of antimicrobial resistance, typically only seen in *Shigella* infections associated with travel. The potential spread of antibiotic resistance within clusters of shigellosis in MSM may have implications for the treatment of enteric pathogens, particularly in those who may be immunocompromised due to HIV infection.

2.11.2 Shigellosis in Germany

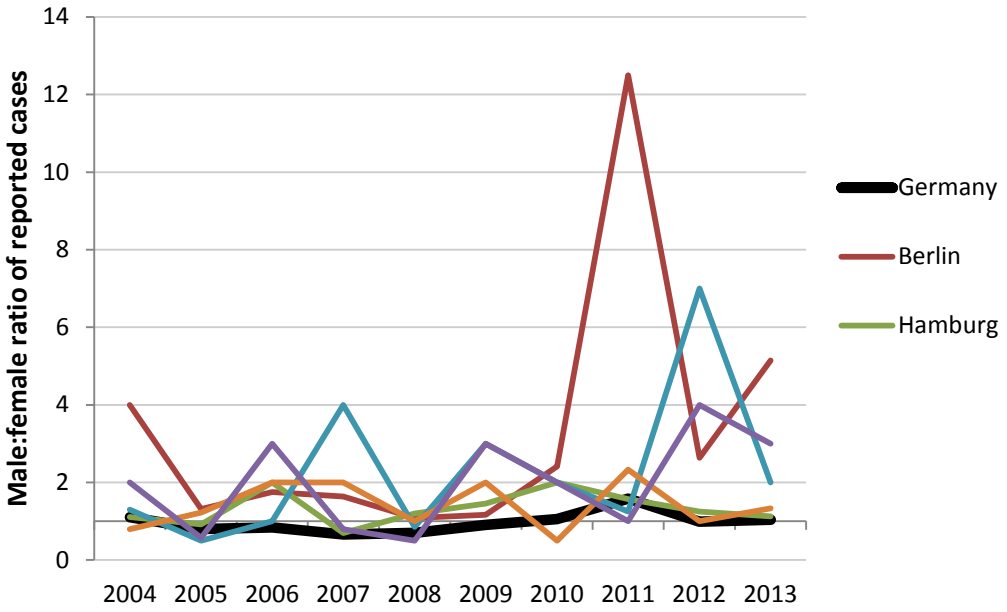
The first recognised outbreak of shigellosis among MSM was identified in Berlin in 2001, after a retrospective investigation revealed that 80% of patients self-identified as MSM, and almost all of these men reported direct or indirect oral-anal sexual contact in the week prior to falling ill (105). The outbreak appeared to have largely been controlled in 2003, but re-emerged in 2004 (see Figure 2-18). Distortions of male-to-female ratios of reported shigellosis cases in several larger German cities in the following years may indicate transient outbreaks, with small case numbers among MSM in those cities (106). From 2009 onwards a new major outbreak emerged in Berlin, continuing until 2016 and potentially spreading – at least transiently - to other cities such as Hamburg, Stuttgart and Cologne/Dusseldorf (106) (see Figure 2-19). Within the Berlin outbreak a transient shift from *S. sonnei* to *S. flexneri* infection was observed: the proportion of *S. flexneri* isolates among male cases aged 20-49 increased from 6% in 2011 to 55% in 2013 and then regressed to 13% in 2015. Between 2010 and 2012, one study reported that among 79 cases of *S. sonnei* identified among patients attending outpatient clinics specialising in HIV care, all were among MSM and more than two-thirds (71%) of cases were also HIV-positive (107). In 2012 and 2013 in Berlin, at least 70-80% of adult male shigellosis cases in the age groups 20-49 years were among MSM (106).

Figure 2-19 Reported cases of shigellosis among persons aged 20-49 years old in Berlin, 2001 to 2015*



*Source: Marcus, U: Shigellose – eine sexuell übertragene Infektion in deutschen Großstädten? (Shigellosis - a sexually transmitted infection in large German cities?). Oral presentation, Munich AIDS and Hepatitis Day 2014

Figure 2-20 Male-to-female ratios of reported cases of shigellosis among persons aged 20-40 years in large German cities, 2004-2013*



*Source: Marcus, U: Shigellose – eine sexuell übertragene Infektion in deutschen Großstädten? (Shigellosis - a sexually transmitted infection in large German cities?). Oral presentation, Munich AIDS and Hepatitis Day 2014

2.12 Invasive meningococcal disease (IMD)

Neisseria meningitidis is an encapsulated bacterial commensal of the pharyngeal mucosa. The organism can cause invasive meningococcal disease (IMD), which presents as septicaemia, meningitis, or both. Most cases in Europe are caused by *N. meningitidis* serogroups B and C. Overall, IMD has a case-fatality rate of around 10%; however, case fatality rates are sometimes higher in outbreaks and among cases due to serogroup C (MenC) (108).

Carriage of *N. meningitidis* is common and ranges from below 5% in young children to a peak of 20–30% in young adults. Carriage is usually asymptomatic, can last for months, and generally leads to immunity. If illness results, this usually occurs within a few days of acquisition. The risk of disease following infection varies, and is higher for serogroup C than other serogroups. Nasopharyngeal carriage of *N. meningitidis* among MSM has been reported to be higher than for heterosexual men, with rates of 15–43% reported. Lower urethral and rectal colonisation has also been reported (108).

The risk of IMD is higher in infancy (EU/EEA age-specific rate 13.4 per 100,000 persons in 2010) and decreases with age (age-specific rates for persons aged ≥20: below 1 per 100,000) (108). Other risk factors for IMD include passive smoking and overcrowding. The role of HIV infection in IMD is not clear. A study from South Africa suggested that HIV infection increases the risk of IMD by 11 times and increases the case-fatality ratio (109). It has also been reported that the cumulative average incidence of IMD among patients aged 25 to 64 with AIDS was 12 times higher than for persons of the same age in the general population (110).

The overall incidence of IMD is decreasing in Europe. Since 2000, many EU Member States have introduced meningococcal vaccines into their routine childhood immunisation programmes. However, few countries have conducted catch-up campaigns and vaccine-induced immunity in adult populations is likely to be low in most countries (108).

Since 2001, IMD clusters in MSM have been reported in Toronto (2001) (111), Chicago (2003) (112) and New York City (2010–2013) (113, 114). All outbreaks were caused by MenC and were of the multilocus sequence type 11 (ST-11) (115). The outbreaks in Toronto and Chicago (six cases each) ended rapidly after carrying out targeted MenC vaccination campaigns in the gay communities affected. However, the New York outbreak (22 cases) was more protracted despite intensive efforts to vaccinate MSM.

In Europe, from October 2012 to May 2013, five IMD cases among MSM living in Berlin were notified to local health authorities (116). All five cases presented with severe sepsis and four died. The patients were aged between 22 and 28 years old; none were HIV-positive. All cases were caused by MenC strains belonging to ST-11. Only two of the cases had a definite epidemiological link, having spent a night together shortly before illness onset. In the same time period MenC clusters among MSM were also reported in Los Angeles and Paris, and a single case from Belgium. All of the European strains showed similar characteristics (108).

Isolates taken from MSM involved in the IMD outbreaks in Germany and France were shown to express nitrite reductase (117), which could improve bacterial survival in micro-anaerobic environments, such as the urethra. Thus the hypothesis was established that sexual transmission of meningococci might play a role in IMD outbreaks among MSM. In this context, a recently described outbreak is also relevant, in which meningococci were detected in urethral swabs from over 60 heterosexual men with clinical suspicion of gonorrhoea (118). Although these were not encapsuled bacteria, they had genetic characteristics typical of MenC, and originated from the same clone which was responsible for the outbreaks in France and Germany. The affected men had symptoms of urethritis, which could not be distinguished from those which may have arisen as a result of gonorrhoea. Whether these meningococci also expressed nitrite reductase has not yet been investigated. In the literature, the isolation of meningococci has been repeatedly described in men with urethritis, but these were mostly encapsulated (119). In summary, more research is needed to establish the frequency with which urogenital or anal meningococcal infections lead to clinical symptoms, and to assess whether sexual transmission is a risk factor for the occurrence of invasive meningococcal infections in MSM.

2.13 Data that EMIS 2017 should collect

It is recommended that EMIS 2017 provide the following information on HIV and STI diagnoses among MSM. These data were also collected during EMIS 2010, which will allow comparison of trends over time. The recency scales for last diagnosis of syphilis, gonorrohoea or chlamydia, and for first diagnosis of HPV or hepatitis C, give an indication of whether and how diagnoses have changed in recent months or years. Note that the numbers of men involved in outbreaks of STIs such as LGV, shigellosis and IMD are usually too small to capture large enough numbers of them in online surveys to perform meaningful analyses.

- Number/proportion of men with diagnosed HIV, including year of diagnosis.
- Number/proportion of men ever diagnosed with syphilis, gonorrhoea and/or chlamydia, including recency of last diagnosis (in previous 24 hours/7 days/4 weeks/6 months/12 months/5 years/more than 5 years ago).
- Number/proportion of men ever diagnosed with anal or genital warts (HPV) and/or hepatitis C, including recency of first diagnosis (in previous 24 hours/7 days/4 weeks/6 months/12 months/5 years/more than 5 years ago).
- Current hepatitis C status (i.e. currently HCV infected, infection cleared (with or without treatment), don't know).
- Hepatitis B: i) Number/proportion of men vaccinated against HBV (including whether the whole course of the vaccination was completed), ii) Number/proportion of men naturally immune to HBV as a result of prior infection, and number/proportion of men diagnosed with chronic HBV infection.

3 Risk factors for HIV and other STIs among MSM

This chapter of the report presents a socio-behavioural review summarizing risk factors for HIV and STIs among MSM. The chapter begins with a broad overview of risk and precautionary behaviours among MSM in Europe, and then focusses on new and emerging behaviours which will be explored in EMIS 2017, including the combining of drugs and sex ('chemsex' - see Section 3.3), and the use of online social and sexual networking tools (dating websites, social and sexual networking smartphone applications – see Section 3.4). Section 3.5 explores mental health among MSM (also a new topic area to be covered in EMIS 2017), and its associations with sexual health.

3.1 Methods

Due to the wide range of topics included, a number of rapid or 'scoping' literature searches were conducted in each topic area, using two electronic databases (Embase and Global Health). The aim of the rapid review was to summarise key concepts and research findings, thus the review is not exhaustive, nor did it attempt to assess the rigour or quality of studies included. Searches were limited to articles published in English since 2006, and were generally restricted to the 38 European countries which were included in EMIS 2010, although some relevant studies from outside Europe were also included. The searches relating to the use of smartphone sexual networking applications and mental health were not restricted to Europe because it was expected that only a small amount of published European literature would be found for these topics. The following search terms and inclusion criteria were used for each topic area:

- Overview of risk behaviours among MSM: combinations of search terms relating to MSM and sexual risk behaviour. A total of 30 articles addressing general behavioural risk factors for HIV and/or STIs among MSM were included.
- Chemsex drug use: combinations of search terms relating to MSM, sexual behaviour, and chemsex drug use (including synonyms such as party and play, psychotropic agent*, psychoactive substance*, etc). A total of 34 articles which investigated associations between chemsex drug use and sexual risk behaviour among MSM were included.
- Online social and sexual networking: combinations of search terms relating to MSM, sexual behaviour and i) online dating websites (including synonyms such as internet dating, online partner selection) ii) smartphone applications (including synonyms such as app(s), mobile application(s)). A total of 26 articles which investigated associations between online sexual networking tools and sexual risk behaviour were included.
- Mental health: combinations of search terms relating to MSM, sexual behaviour and mental health, including additional related terms such as depression and anxiety. A total of 27 articles which investigated associations between mental health and sexual risk behaviour among MSM were included.

In addition to searches for peer-reviewed papers, grey literature published by AIDS or LGBT organisations (e.g. NAM Aidsmap[11], the LGBT Foundation[12]) was consulted, and data published in the EMIS 2010 report were also reviewed.

3.2 Overview of risk and precautionary behaviours among MSM in Europe

Although data suggest that biological and structural drivers are important in understanding high HIV/STI transmission rates among MSM (120, 121), individual-level risk factors for HIV have been well documented and include high numbers of sexual partners (11, 122) and anal intercourse, particularly unprotected anal intercourse (UAI – i.e. anal intercourse without the use of condoms or, in the case of HIV, antiretroviral drugs to prevent HIV acquisition/transmission. Although the term 'condomless anal intercourse' (CLAI) is increasingly used - because men may be taking antiretroviral drugs for HIV treatment or prevention - the term UAI is used here when it was referred to in previous literature as such) (11, 123). Other risk factors for HIV among MSM include co-infection with other STIs (122, 124, 125), use of alcohol and/or illicit drugs before sex (122, 126), visiting sex themed venues (e.g. gay sex clubs or parties, gay saunas, porn cinemas) (11) and travel to engage in sex abroad (127). Individual-level precautionary behaviours include HIV/STI testing and treatment, partner selection, condom use, and oral chemo-prophylaxis.

Many risk factors for HIV are also risk factors for other STIs (52, 122-124, 128), although EMIS 2010 data indicated that the number of sexual partners is a more important risk factor for newly diagnosed STIs (including syphilis, gonorrhea, chlamydia, anal/genital warts and/or anal/genital herpes) compared to newly-diagnosed HIV. In multivariable analyses, the risk for having a newly diagnosed STI increased steadily with increasing numbers of sexual partners, however the association between the number of sexual partners and newly-diagnosed HIV was smaller in magnitude and only statistically significant when the number of partners was larger than ten. The greater impact of multiple partners on STI compared to HIV risk may be partly explained by the fact that most STIs – unlike HIV – are easily transmitted via oral sex (for which condoms are not often used or routinely recommended) (11).

Additional analyses of EMIS 2010 data indicated that after controlling for the number of sexual partners, increasing diversity of sexual practices (including mutual masturbation, oral sex, rimming and/or brachioproctic insertion or fisting) are also associated with increasing STI risk among MSM (Axel Schmidt, personal communication, December 2016). Other studies have similarly found a range of sexual practices to be associated with acquisition of STIs including anal sex toy use (129) and fisting (124). Outbreaks of HCV have been recognized among HIV-positive MSM in Europe since 2000, and risk factors include high numbers of partners, fisting, and

[11] www.aidsmap.com
[12] http://lgbt.foundation/

other traumatic sex practices with a risk of bleeding (128, 130). Recent outbreaks of less common STIs among MSM, such as LGV and shigellosis, have been associated with HIV-positivity, high numbers of sexual partners, attendance at sex parties, and use of social networking websites to find sex partners (85, 104).

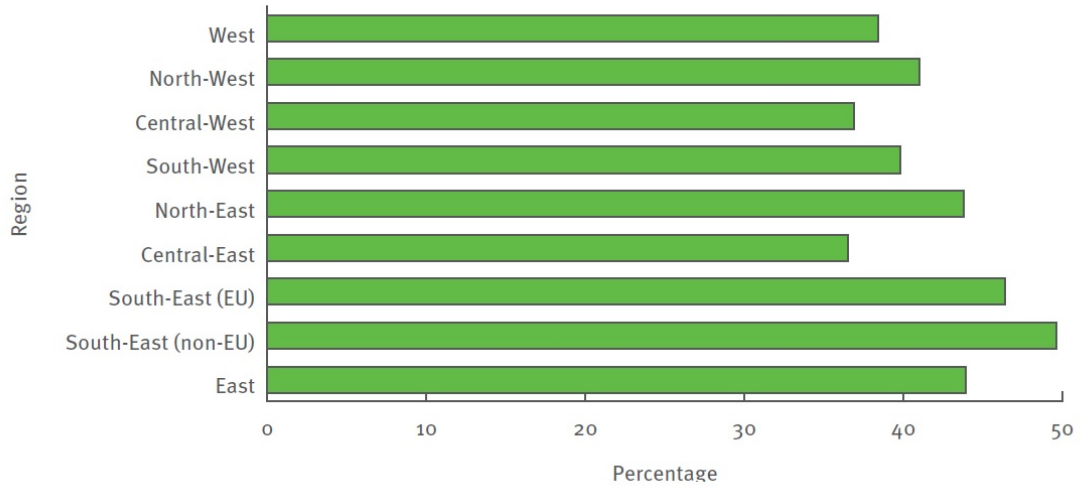
3.2.1 Recent trends in sexual risk behaviour

Some studies indicate increasing trends in sexual risk taking among MSM over the last decade or so, including increases in the reported numbers of sexual partners and in rates of UAI. In the Netherlands, data from national surveillance at 26 STI clinics showed a significant increase in the proportion of MSM reporting three or more partners in the last 6 months, from approximately 65% in 2007 to approximately 75% in 2011 ($p<0.001$) (123). In Spain, data from a second generation surveillance system (an annual one-day cross sectional survey among people living with HIV) revealed a significant increase in reports of unprotected sex at last sexual encounter among MSM, from 13.6% in 2002 to 22.3% in 2011 ($p<0.05$) (131). Alongside these increases, research indicates that MSM are increasingly engaging in HIV serosorting (seeking HIV-concordant partners for condomless sex) (132-134). Although adopted as an HIV prevention strategy, serosorting poses a risk for transmission of other STIs (as well as variants of HIV which may promote drug resistance, if HIV-positive individuals are not effectively treated), and may be partly responsible for recent increases in rates of STI diagnoses among MSM in Europe (2-4). Other research suggests that the perceived threat from HIV has lessened since the availability of antiretroviral therapy, and that this has contributed to increases in sexual risk taking (135). One qualitative study conducted among MSM at sexual health clinics in the UK reported that vulnerability to HIV infection was regarded as low when UAI was insertive, and that this strategy was used in otherwise high risk situations - for example, with multiple partners of unknown status, or to engage in UAI in a serodiscordant relationship (136). In the same study, MSM reported that condoms were regarded as a hindrance to sexual pleasure and spontaneity, and as a barrier to intimacy with long-term partners.

3.2.2 Characteristics of men engaging in UAI

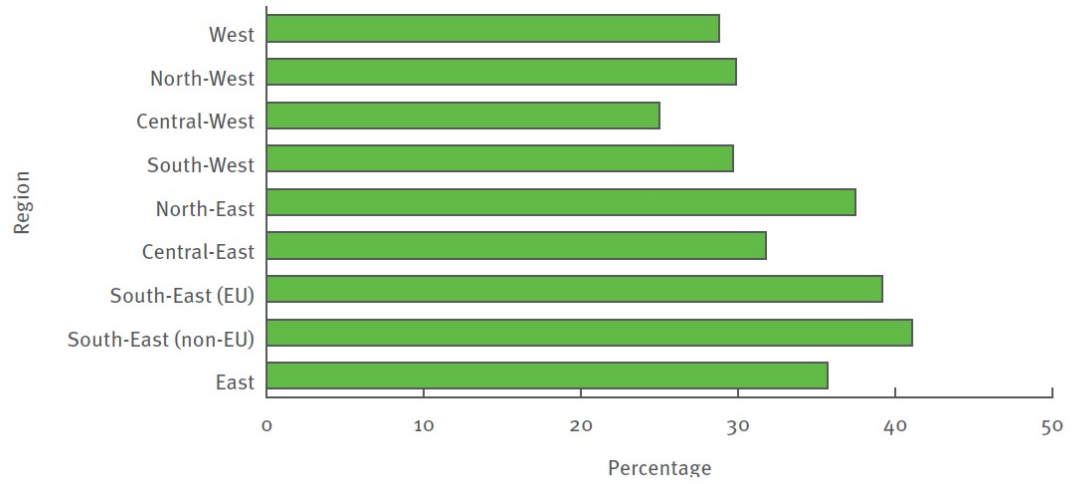
Studies in Germany, Spain and Norway have found that MSM reporting UAI were more likely to have used drugs, to have higher numbers of sexual partners, to use the Internet to find casual partners, to have been diagnosed with gonorrhea, chlamydia or syphilis, and to have engaged in sero-sorting (122, 137, 138). In terms of geographic distribution, in EMIS 2010 UAI with non-steady partners and non-concordant UAI with any partner type were most frequently reported in South-East Europe (Bulgaria, Cyprus, Romania, Malta, Bosnia and Herzegovina, Croatia, Macedonia, Serbia and Turkey) and least frequently reported in Central-East Europe (Czech Republic, Hungary, Poland, Slovenia and Slovakia) and Central-West Europe (Austria, Switzerland, Germany and Luxembourg) (see Figure 3-1 and Figure 3-2).

Figure 3-1 UAI with non-steady partners in the past 12 months (among respondents who had had sex with non-steady partners) by sub-region, EMIS 2010



Source: EMIS 2010 Technical Report (11)

Figure 3-2 Non-concordant UAI with any male partner in the past 12 months, by sub-region, EMIS 2010



Source: EMIS 2010 Technical Report (11)

Data from EMIS 2010 also revealed that among men reporting any sex in the previous 12 months, the overall prevalence of non-concordant UAI with steady or non-steady partners was 30%. In adjusted analyses, factors associated with reporting non-concordant UAI included being aged less than 25, lower educational attainment and being HIV-positive. Studies in the UK, Sweden and elsewhere have also noted that

MSM who intentionally looked for or engaged in UAI (referred to as barebacking) tended to be younger (132), have lower educational attainment (139) and be HIV-positive (140, 141).

3.3 Chemsex drug use and its association with sexual risk behavior

3.3.1 Prevalence of party and chemsex drug use in Europe

Cross-sectional prevalence studies indicate that a higher proportion of MSM use a range of illicit drugs (non-prescription drugs that are considered illegal or 'recreational' in most countries) than is the case among the general population (142-145). Much of the literature on drug use among MSM has focused on substances used in 'clubbing' social environments such as nitrites ('poppers'), cocaine, ecstasy, LSD and other amphetamines. However, more recent evidence points towards increasing use of newer psychoactive substances including crystal methamphetamine, mephedrone, gamma-hydroxybutrate (GHB) and gamma-butyrolactone (GBL) (146-150). When taken before or during sex, these drugs facilitate sexual arousal, sexual confidence and longevity of sexual contact (151), giving rise to the term 'chemsex'. Precise definitions of chemsex are rarely given although one study cited this as 'the intentional combining of sex with the use of particular non-prescription drugs (usually crystal methamphetamine, mephedrone, ketamine and/or GHB/GBL) in order to facilitate or enhance the sexual encounter' (152). This is described as being distinct from sex on drugs that is coincidental. 'Chemsex' drugs are often used in combination, and may facilitate sexual sessions lasting several hours or days with multiple sexual partners (153).

Estimating the prevalence of drug use among MSM is difficult. In many European countries, national drug surveillance systems do not collect or disaggregate data by sexual orientation, meaning estimates of prevalence are largely reliant on community and clinical surveys. Some of the most robust national level estimates come from EMIS 2010, where use of 'party drugs' (a combined measure of ecstasy, amphetamine, methamphetamines, GHB, ketamine, and cocaine) within the previous 4 weeks was highest among MSM in Western Europe (10.6% - including France, Republic of Ireland, the Netherlands and the UK) followed by MSM in South-Western Europe (6.6% - including Greece, Spain, Italy and Portugal), and was lowest in countries in the North-Eastern (2.3% - including Estonia, Lithuania and Latvia) and Eastern (2.4% - including Belarus, Moldova, Russia and Ukraine) regions (11).

Additional analyses of EMIS 2010 data from 44 European cities found that use of GHB/GBL, ketamine, crystal methamphetamine and/or mephedrone (in any context, not only or exclusively in combination with sex) was highly geographically variable, being highest in Western European cities (including London, Manchester, Brighton, Amsterdam, Madrid, Barcelona and Valencia), and lowest in Eastern European cities including Tallinn, Bucharest and Sofia (148). Of the four drugs assessed, use of GHB/GBL, ketamine and mephedrone was most prevalent (prevalence of use during the last four weeks of up to approximately 10%), while crystal methamphetamine was less commonly used (less than 5% of MSM having used it in the past four weeks). Another UK study making use of EMIS 2010 data noted that reported use of crystal

methamphetamine (in any context) was geographically heterogenous within London as well as across England, with 4.9% of MSM in Lambeth, Southwark and Lewisham reporting use of crystal methamphetamine in the previous four weeks (areas of London which are home to large populations of gay and bisexual men, and to men living with diagnosed HIV) compared to 2.9% of MSM elsewhere in London and 0.7% of MSM elsewhere in England (150). Although overall prevalence of IDU among MSM appears to be low (154), evidence from the UK suggests this may be increasing as newer drugs lend themselves to intravenous administration (149, 150), and the term 'slamming' has often been used to describe injecting drugs in the context of chemsex.

Cross-sectional studies across Europe indicate that the use of party and chemsex drugs is more prevalent among HIV-diagnosed MSM compared to those who last tested negative or who have an unknown serostatus (148, 155-158). Although age-group categorizations differ between studies, broadly studies have reported that party and chemsex drug use is more prevalent among men aged younger than 40 compared to those aged 40 or over (11, 158, 159). Evidence from EMIS 2010 also indicated that use of party and chemsex drugs in the past four weeks was more common among MSM who had visited gay commercial venues (cafes, bars and pubs with gay discos and night clubs) or sex-themed venues (e.g. backroom of a bar, gay sex club) compared to those who had not (11). Schmidt et al reported that men who had attended private gay sex parties in the past four weeks had a higher prevalence of chemsex drug use compared to men who had visited sex-themed venues (148), and it may be that chemsex is even more prevalent in private compared to public settings, where drug use is unlikely to be 'policed' or monitored.

3.3.2 Party and chemsex drug use and sexual risk behaviour

In reviewing the literature, an association between drug use and sexual risk behavior is evident. Many of the quantitative data come from cross-sectional studies and are what Leigh and Stall (160) refer to as 'Global assessments' – i.e. the measures of substance use and sexual behavior occur during a specified period of time (e.g. the past four weeks), but the drug use and sexual behaviours do not necessarily occur together. A smaller number of studies have captured 'event-level assessments' – i.e. measures of drug use and sexual behaviours surrounding specific sexual encounters (161-163). While event-level assessments are more precise, these data are sparse. Several large studies have used global assessments and have found associations between party or chemsex drug use and UAI with steady or non-steady partners (11, 34, 149, 156), increased numbers of sexual partners (148, 149, 156) and/or STI diagnoses (143, 149, 164). Studies using event-level assessments of chemsex drug use reported that use of either crystal methamphetamine, mephedrone, GHB and/or ketamine was associated with increased odds of UAI in multivariable analyses of dyadic encounters (i.e. involving two men – OR 2.10, 95% CI 1.35-3.28) (162), and that crystal methamphetamine was associated with UAI in multivariable analyses of multi-partner encounters (i.e. involving three or more men – OR 3.18, 95% CI 1.19-8.48) (163). A systematic review of event-level substance use and sexual risk behavior among MSM (with most studies coming from North America) found that

among ten substances investigated, only methamphetamine and binge drinking were consistently associated with event-level sexual risk behavior, particularly receptive UAI, among MSM (165). However, measurement of substance use was highly variable between studies and this may partially explain some of the discrepant findings.

In the absence of a randomized clinical trial, a causal effect between substance use and sexual risk behaviour is difficult to establish, and different hypotheses have been put forward in order to explain the observed association. One is myopia theory, which posits that substance use inhibits the ability to forsee any possible longer-term consequences of one's behaviour, and thus it may lead to increases in risky behaviour (166). Another theory highlights 'cognitive escape', suggesting that substance use is a mechanism by which MSM can escape the restrictive norms governing gay sexuality to engage more freely in sex, or to do so with greater self-confidence, overcoming concerns relating to body image, sexual performance and/or fear of rejection by sexual partners, particularly following disclosure of HIV-positive status (167, 168). An alternative explanation for the link between substance use and risky sex is 'sensation seeking', or the desire to pursue the most sensorily powerful sexual experiences (169).

Qualitative research among MSM using chemsex drugs in London sheds light on some of these themes (150). Among 30 men completing in-depth interviews as part of this study, about a third described instances of unintended sexual risk behaviour while using chemsex drugs. Most of these men reported that they generally sought to have protected sex (at least with sero-discordant partners or partners of unknown sero-status) but, for a variety of reasons, did not always do so. Some men described drugs as having myopic properties, altering their ability to perceive the wider consequences of their actions. A few men described a very clear transition in their sexual behaviour since beginning to engage in chemsex, from someone who was very risk aware and sexually cautious to someone who engaged in sex that carried a risk of HIV or STI transmission. In contrast, nearly a quarter of participants reported maintaining strict personal rules about condom use with partners of sero-discordant or unknown HIV status while using chemsex drugs (however, condomless sex with HIV sero-concordant partners still carries a risk of transmission of other STIs). There were no obvious patterns in the drugs used by these men that distinguished them from men who did engage in UAI (deliberately or otherwise), although none were injecting drug users. Some men acknowledged that they could blame their risky sexual behaviour on drug taking, but mentioned that drugs enabled them to do something they had desired or wanted to do. Irrespective of drug use, around a quarter of the men interviewed had made a conscious decision not to use condoms for most instances of anal intercourse. All of these men had diagnosed HIV, and preferred to seek out condomless sex with men they knew or believed to be HIV-positive, because they felt that sex without condoms was more enjoyable.

3.3.3 Chemsex drug use within MSM sub-groups

Few studies have provided information on chemsex drug use within specific MSM sub-groups (e.g. young MSM, migrant MSM). Within Europe, a number of studies have shown that the prevalence of drug use is generally higher among MSM aged less than 40 compared to those aged 40 or older (11, 158, 159), and studies in the USA (170) and Australia (171) have similarly found that drug use is often higher among younger compared to older men. Studies from the USA also note that the prevalence of drug use is higher among marginalised or ethnic minority MSM groups (172, 173). Data on drug use among MSM sub-groups in Europe are lacking and further research in this area is warranted.

3.3.4 Drug use prevention and treatment services for MSM

Concern has been raised that existing drug harm reduction services may lack an awareness of issues pertinent to MSM populations, including an understanding of gay sexual contexts in which party and chemsex drug use occurs (152, 174). During qualitative research in London, participants frequently reported talking about chemsex with health advisors at sexual health clinics (150), rather than with counsellors at drug harm reduction services. Many considered the sexual health clinic the best place to discuss their drug use without fear of judgement, and because of the overlapping nature of drugs and sexual risks in their lives. A few participants mentioned that combined or integrated drug and sexual health services would be ideal for helping them to address chemsex related problems. Such services need to be resourced to meet the specific needs of MSM, and may benefit from partnering with LGBT organisations with relevant expertise. Another pan-European study found that the inclusion or discussion of issues relating to recreational drug use in HIV guidelines varied greatly across Europe, with more specific, evidence-based recommendations on topics relating to interactions between recreational and antiretroviral drugs, and on adherence to antiretroviral medication, compared to topics relating to HIV/STI transmission risk behaviours (175).

3.4 The Internet and sexual risk behaviours of MSM

The Internet provides opportunities for sexual minorities to communicate and interact, and MSM frequently use it for social and sexual networking purposes (176, 177). Due to its anonymity, online networking and partner selection may be particularly valued by young MSM who have not yet come-out (178), or by other MSM groups who may be subject to stigma or discrimination (179). A range of tools are available including social and sexual networking websites, and more recently sexual networking smartphone applications (hereafter referred to as ‘apps’). As the available range of online tools has proliferated, so have concerns that this may lead to increases in sexual risk taking among MSM.

A number of meta-analyses including studies conducted in North America and Europe have compared the prevalence of UAI among MSM who sought sexual partners 'online' and 'offline' (i.e. at physical venues) (176, 180). These have generally reported that internet initiated encounters had elevated odds for UAI compared to encounters initiated 'offline', and measures of effect were often stronger for HIV-positive individuals. Many of the data come from cross sectional studies and as such the observed association between online partner selection and increased sexual risk behavior cannot be identified as causal. However, possible explanations include that online technologies may promote riskier behaviour by expanding access to sexual networks (known as the 'accentuation hypothesis'), and/or that MSM who find partners online are inherently riskier than those who do not (referred to as the 'self-selection hypothesis'). In support of the latter hypothesis, one study in the USA found that while retrospective reports of internet sex seeking were associated with past HIV or STI risk behaviours, use of daily diaries by a subset of men who sought partners both online and offline (tracking the same person's behavior over time; comparing rates of risk-taking on occasions when sex partners were met online and offline) revealed that UAI was *not* more likely with partners met online compared to those met offline (181). In other words, the results indicated that individuals who sought partners online more frequently were more likely to have higher HIV/STI risk profiles, however among those seeking partners online, risky behaviour was not more likely with online compared to offline partners. This study included a small sample (113 men), however other studies have similarly suggested that the internet *per se* may not create elevated risk for HIV/STI transmission, but may attract individuals who have higher-risk behaviour to begin with (182, 183). More recent studies have reported no association between partner meeting venue and UAI (178, 184, 185), and it has been suggested that online dating may have become normalized over time, with a smaller proportion of high-risk MSM now using dating websites to find partners online compared to in the late 1990s or early 2000s.

One study in the Netherlands reported that an unadjusted association between use of online dating websites and UAI among HIV-positive individuals became non-significant when adjusting for partnership characteristics, including perceived HIV sero-concordance. This suggests that differences in partnership characteristics may be responsible for increases in UAI in online compared to offline established partnerships (186). Several studies have reported that MSM are more likely to disclose their HIV status and sexual preferences to prospective partners met online compared to those met offline, and this may guide MSM in identifying sero-concordant UAI partners (176, 177, 179, 186). The ability to anonymously exchange information may make serostatus disclosure easier for HIV-positive individuals in particular, however studies have also found evidence for UAI serosorting among HIV-negative individuals selecting partners online (176, 186). Research indicates that MSM have greater success in maintaining serosorting and strategic positioning practices than consistent condom use (187, 188), and this is of concern given that condomless anal intercourse among HIV sero-concordant individuals carries a risk for transmission of other STIs, and that HIV-negative sero-concordance depends upon risks taken since the most recent HIV test.

Since about 2010, smartphone apps designed to help MSM find partners online have become increasingly popular (183, 189). These technologies potentially provide even greater access to sexual networks compared to online dating websites, given that they incorporate geolocation features allowing users to find partners who are located nearby in real-time, and that people tend to carry their smartphone on their person at most times. Such geosocial networking (GSN) apps may also feature 'push notifications' which inform users instantaneously when they are being sought by others. Given the recency of their introduction, very few studies have explored associations between GSN app use and sexual risk behaviour within European MSM populations, and some of the studies conducted in North America have included small sample sizes (183, 190-192). One study from Germany reported that among HIV-negative individuals, meeting the last non-steady anal sex partner via a smartphone app was weakly associated with diagnosis of a bacterial STI in the previous 12 months (age-adjusted OR 1.48, 95% CI 0.94-2.34) (193). Another study from the UK reported that compared to MSM who had never used a popular GSN smartphone app, men who had used this app at least once per month were significantly more likely to report having gonorrhea ($p=0.003$) and chlamydia ($p=0.03$) (but not syphilis, $p=0.6$) in the past 12 months (194). Some GSN apps have recently announced the addition of optional HIV-related fields in their user profiles (including HIV status , last HIV test date, use of PrEP, and the option for HIV-positive individuals to indicate an undetectable viral load) (195), and future research should explore the potential impact of such features on serosorting and the prevalence of CLAI among MSM.

3.4.1 Online social and sexual networking among MSM sub-groups

In general, few of the published data have disaggregated findings for specific MSM sub-groups, although some studies have focused on young MSM, a group with high prevalence of use of social and sexual networking websites and apps (178, 196, 197). One small study in the Netherlands (including 95 participants) revealed that almost half (45%) of young MSM aged between 16 and 25 reported UAI at their first episode of anal-sex, and that of these, almost half had met this UAI partner online (178). Further research on the use of social and sexual networking websites and apps by sub-groups of MSM in Europe, particularly young MSM, is warranted.

3.4.2 Online targeting of HIV and STI prevention interventions

Promoting HIV prevention messaging via social media seems promising and acceptable to MSM. One randomized community trial in the US reported that the presence of a health educator who responded to questions about HIV testing on dating and hook-up websites significantly increased the HIV testing rate among participants (198). Encouraging frequent HIV testing among HIV-negative MSM using online platforms (particularly those using such platforms to identify partners for condomless sex) represents an important HIV prevention objective, as does caution against condomless sex based on perceived HIV sero-concordance. One survey in Scotland

reported that the vast majority of participants (86% of social networking website users, 74% of app users) felt it was acceptable for a health-worker to have an online profile or identity, allowing users to ask such a person for sexual health information or advice. Furthermore, around half of participants said they would be likely to use an app allowing a one-to-one chat with a sexual health adviser (53%) or a service which sends text message reminders about sexual health check-ups (49%) (199). Despite the widespread use of social networking apps by MSM, research within the EU found that smartphone apps were ranked fourth (behind websites, saunas and gay clubs) in terms of their importance to stakeholder's current HIV prevention work, with only 37% engaging in HIV prevention activities on these platforms (200). As such, organisations involved in coordinating and conducting HIV prevention activities for MSM require guidance and support in order to facilitate more widespread use of smartphone apps as part of their HIV prevention programmes.

3.5 The interplay between mental and sexual health

MSM are reported to suffer poorer mental health, including higher rates of depression and anxiety, compared to the general male population (201-205). This has been hypothesized to result from minority stress (representing the conflicting relationship between minority and dominant values or behaviours) (206) and internalized homonegativity (IH, defined as gay or bisexual individuals' inward direction of society's homophobic attitudes towards the self) (207). Minority stress and IH have structural and environmental determinants (such as prevailing permissive or restrictive laws regarding homosexuality, and broader societal acceptance or rejection of homosexuality (206, 208-210) in addition to individual-level ones (such as perceived or experienced stigma and discrimination (205)), and have been linked to feelings of inferiority, low self-esteem and loneliness (206, 208, 211, 212). These feelings are hypothesized in turn to be associated with a disregard for one's own or others' health, and decreased engagement with preventive or protective health behaviours (209, 211, 213).

In cross-sectional studies, IH among MSM has been associated with discomfort discussing sexuality (214), poorer connections to gay social networks and peers (208, 209), lower measures of being 'out' about homosexuality (209, 214) and lower levels of HIV testing (214, 215). Data from EMIS 2010 showed that IH was positively associated with a perception of not having control over sexual risk taking (209), and inversely associated with finding it easy to say no to unwanted sex (208). A study in Spain reported that IH was associated with an increased likelihood of having unprotected sex with causal partners (137). However, the nature of the relationship between IH, other mental health conditions and sexual risk behaviour has not been extensively studied in European MSM populations.

Much of the research into psychosocial health problems and sexual risk behaviours among MSM has come from North America, although some studies have included small sample sizes (211, 216-219). One small study among 80 young (aged between 14 and 21) ethnically diverse MSM in New York City found that various mental health

concerns were related to each other as well as to subsequent sexual risk behaviours: low self-esteem was significantly related to symptoms of anxiety, and anxious symptoms were in turn associated with substance abuse and more sexual partners (218). However, other North American studies have reported mixed evidence for an association between IH and/or depression and sexual risk behaviours (211, 213, 216, 217). For example, one longitudinal study including 119 young MSM aged between 16 and 20 found that diagnoses of major depressive disorder (MDD) or post-traumatic stress disorder were not associated with the total number of male partners, and MDD was associated with fewer rather than more unprotected anal sex acts (217). The authors suggest that there may be more proximal predictors of sexual risk behaviours (such as norms, self-efficacy and intentions) than the specific psychiatric disorders they investigated, and/or that methodological differences may account for divergent findings between studies (for example, methods for classifying mental health conditions, which have been measured as either symptom counts or confirmed or self-reported diagnoses).

In studies carried out in the USA and elsewhere, IH has been correlated with depression, anxiety symptoms, substance use disorders, and suicidal ideation (204, 212, 214). The variety of inter-related psychosocial health problems affecting MSM are sometimes conceptualized within syndemic theory, which specifies that the presence of multiple inter-related afflictions contributes to an excess burden of disease. One study including data from almost 4,000 MSM in 151 countries explored the association between multiple conditions (including homelessness, illicit substance use, depression, sexual stigma, and violence for being perceived as MSM) and UAI as well as the prevalence of HIV infection (220). The study found that each single syndemic condition was significantly associated with at least one other, and in multivariate analyses, increasing numbers of syndemic conditions were associated with increased odds for both UAI and HIV infection (given that the data were cross-sectional, neither the direction of associations nor any causal effects can be assumed). Another cross-sectional study among HIV-negative MSM in Belgium found inter-correlations between syndemic factors including depressive symptoms, alcohol use and use of party drugs for sexual sensation seeking, and in multivariate analyses, sexual sensation seeking was associated with increased odds for UAI with casual partners (221). Furthermore, qualitative research in the UK and USA has reported that some MSM report engaging in risky sex or sexual sensation seeking in order to ameliorate feelings of loneliness, low self-esteem, and sexual orientation or HIV-related stigma (150, 222).

3.5.1 Interventions focusing on mental and sexual health

Research supporting the syndemic effect of multiple psychosocial health conditions calls for an integrated approach to overall MSM health and well-being (204, 220). In the UK, Mercer *et al* recommended that sexual health clinics should offer holistic care, either in-house or through referral, while healthcare professionals in general medical services should have greater awareness of the sexual as well as other healthcare needs of MSM (201). Across Europe, it is likely that multi-level strategies will be required in order to improve mental and sexual health outcomes among MSM,

including interventions targeted at the individual as well as at the structural level (e.g. improving policy and legal frameworks which support equality in terms of civic and social rights for MSM). Ross *et al* propose that individual-level anti-IH measures for MSM could leverage the power of the internet, providing targeted, easy-to-read informational modules which instill confidence and provide social and moral support to MSM (214). Others have suggested that broad sexual health education and same-sex affirming promotional measures might help to lower homonegative internalisations among MSM, and assist them in developing communication skills in order to negotiate safe sex or refuse unwanted sex (208).

3.5.2 Mental health among MSM sub-groups

Published literature on the associations between mental health and sexual risk taking among MSM sub-groups in Europe is sparse. In studies in Australia (203) and France (202), rates of hospitalization for anxiety and mood disorders, and the occurrence of major depressive episodes (MDE), were higher among HIV-positive MSM compared to HIV-negative MSM or to the general male population. In the French study (202), MDE among HIV-positive individuals (including heterosexual men and women as well as MSM) was positively related to experiences of discrimination, and HIV-positive MSM are likely to require additional support as a result of stigma and discrimination experienced on account of sexual orientation, in addition to HIV status. Studies in the USA (213, 214), Australia (203) and the UK (223) have reported mental health to be poorer in men identifying as bisexual compared to those with a gay, queer or other sexual identity, and this topic warrants further investigation. Analyses of EMIS 2010 data found that IH was higher in MSM in younger compared to older age groups (208, 209), and the experience of coming-out may be a particularly salient time for young MSM. Much of the research focusing on black and minority ethnic MSM has been conducted in the USA, where it has been reported that African American gender norms relating to masculinity conflict with notions of homosexuality and bisexuality, leading to even further increases in IH among this group (211, 213, 214, 219). While one UK study reported that depression was more prevalent in black or Asian compared to white MSM (223), to date few European studies have focused on the mental health of ethnic minority MSM.

3.5.3 Methods used to measure mental health conditions

A variety of tools have been used in the literature to assess depression and anxiety. Symptoms of depression were measured in a study in France (202) using a module of the World Health Organization's Composite International Diagnostic Instrument, which defines a 12-month major depressive episode (MDE) as a period of at least 2 weeks with the presence of at least five of eight core depressive symptoms which affect daily activities. In the UK, depression has been assessed using a two or nine item measure from the Patient Health Questionnaire (201, 223), and anxiety has been measured using the Generalized Anxiety Disorder 7 (a seven item measure) (223). Suicide

attempt was measured by asking 'In the last year, have you made an attempt to take your life? (yes/no) while self-harm was measured by asking 'In the last year, have you deliberately harmed yourself in any way but not with the intention of killing yourself? (yes/no) (223). In studies in Belgium (221) and the USA (219, 224), depressive symptoms were assessed using the Center of Epidemiologic Studies Depression (CES-D) scale, a 20 item measure that assessed levels of depressive symptoms over the past week. The Belgian authors report that the CES-D is one of five scales most frequently used to measure self-reported depression in non-clinical populations (221). In one American study the 20-item CES-D was compared with multiple shortened versions of the scale (225), and it was found that a 12-item scale measured the same symptom dimensions as the original instrument with little reduction in precision. In other American studies, the Brief Symptom Inventory (BSI) has been used to assess symptoms of depression and anxiety using six item scales (211, 218). One meta-analysis exploring the relationship between IH and mental health outcomes reported that in 31 studies, a variety of different measures had been used to assess depression and anxiety, including Beck's Depression Inventory, Beck's Anxiety Inventory, Hopkins Symptom Checklist, the BSI and CES-D, among others (226).

3.6 Data that EMIS 2017 should collect

It is recommended that EMIS 2017 help to address gaps in the available data by collecting information on the following topics:

- Sex with steady and non-steady male partners in the past 12 months (how many partners, condom use, knowledge of partner's HIV status, where partner was met, including 'offline' and 'online' options).
- Use of illicit drugs, and use of psychoactive substances prior to or during sex (i.e. combining drugs with sex - chemsex).
- Symptoms of depression and anxiety, information on self-harm/suicidal ideation.
- Questions which will help with identification of MSM sub-groups (young MSM, migrant MSM, MSM who receive money for sex and/or who inject drugs)

4 HIV and STI prevention, diagnostic and treatment services for MSM

This chapter of the report considers barriers, challenges and gaps in prevention, diagnostic and treatment services for HIV and other STIs among MSM in Europe. The chapter starts with a brief overview of HIV and STI related knowledge among MSM in Europe, as evaluations of knowledge should help to inform the content of future educational and other prevention programmes. This is followed by sub-sections which consider barriers to the uptake of HIV and STI testing, prevention and treatment services among MSM. At the end of each sub-section, a summary of relevant data that will be collected during EMIS 2017 is presented.

4.1 Methods

As it was expected that few peer-reviewed papers would provide comprehensive information on access to HIV and STI services by MSM across Europe, for this chapter of the report information was obtained from key European studies among MSM including EMIS 2010, the Sialon II bio-behavioural survey, and the HIV-COBATEST project (HIV community-based testing practices in Europe) (for descriptions of these studies, see Section 1.3.1). Data from the 2016 round of Dublin Declaration monitoring were also obtained from the ECDC,[13] and descriptive analyses were performed, grouping the data by Western and Eastern European 'macro' regions. Data were available for all 17 Western European countries included in EMIS 2010, and for 18 of the 21 Eastern European countries included in EMIS 2010 (data for Belarus, the former Yugoslav Republic of Macedonia and Russia were not available – see Table 4-1).[14] This section of the report was also informed by data on legal and regulatory barriers which impede the HIV care continuum in Europe, obtained from the 'Barring the Way to Health' online database. This database is maintained by the Global Network of People Living with HIV (GNP+) as part of the OptTest Project (Optimising Testing and Linkage to Care for HIV Across Europe) and is available freely online (227).[15]

[13] The Dublin Declaration was adopted in 2004 and emphasises HIV as an important political priority in Europe and Central Asia. Signatory countries closely monitor, on a biannual basis, the implementation of actions taken to tackle HIV/AIDS in their country. Further details available at http://ecdc.europa.eu/en/healthtopics/aids/Pages/monitoring-dublin-declaration.aspx

[14] To avoid the duplication of work currently being undertaken by the ECDC, the Dublin Declaration data presented here could not be verified with country contacts.

[15] Due to constraints on time and resources, data from the 'Barring the Way to Health' online database were not verified with country contacts prior to analysis.

Table 4-1 Countries included in Western and Eastern European macro regions in Chapter 4, and data sources

	EMIS 2010 Western European countries	EMIS 2010 Eastern European countries
Data available from 2016 Dublin Declaration monitoring and Barring the Way to Health regulatory barriers database	**n=17** Austria Belgium Denmark Finland France Germany Greece Ireland Italy Luxembourg Netherlands Norway Portugal Spain Sweden Switzerland United Kingdom	**n=18** Bosnia Bulgaria Croatia Cyprus Czech Republic Estonia Hungary Latvia Lithuania Malta Moldova Poland Romania Serbia **Slovakia*** Slovenia Turkey Ukraine
Data from Barring the Way to Health regulatory barriers database only		**n=3** Belarus Macedonia Russia

*Data for Slovakia were not included in the Barring the Way to Health database

4.2 Knowledge about HIV and STIs among MSM in Europe

Knowledge about HIV and STIs, including knowledge of potential risk behaviours for HIV/STI transmission, and about the availability of testing and treatment, is likely to reflect the reach of educational and promotional programmes, while gaps in knowledge can be used to inform the future content of such programmes. EMIS 2010 assessed participants' HIV and STI related knowledge by asking questions in four key topic areas, including HIV testing and treatment (five questions), HIV transmission (five questions), STI transmission (three questions) and knowledge of PEP (three questions) (11). For each question, true statements were provided and respondents were asked to state whether they already knew this information, whether they were unaware of the information, or whether they were unsure about, didn't understand, or didn't believe the information. Only those who responded 'I already knew this' were considered to have had correct pre-existing knowledge, and mean national scores were calculated for each knowledge area by calculating the percentage of correct answers per respondent.

Overall, respondents across Europe were more knowledgeable about HIV testing and treatment (median of national mean scores 93%) than other topics. Knowledge of HIV transmission (median of national mean scores 81%) was greater than that of STI transmission (median of national mean scores 65%). Thus educational and prevention programmes across Europe should place additional emphasis on issues surrounding HIV and particularly STI transmission. Knowledge of PEP was low in every country (median of national mean scores 30%), and corresponds with low usage of PEP across Europe, as discussed further in Section 4.4 below.

Overall in all four topic areas, mean national knowledge scores were higher in Western compared to Eastern European countries (the 16 countries with the highest overall mean national knowledge scores (across all topic areas) were in the WHO region of Western Europe, with the exception of Poland, which ranked ninth). Western European states that scored lower in terms of overall knowledge included Finland and Greece. Among the countries with the lowest scores were a broad range from the WHO regions of Eastern and Central Europe. Across Europe in general, knowledge scores were positively associated with age, education, larger settlement size, identifying as gay or homosexual (rather than bisexual or by means of some other label), being out to others and having been diagnosed with HIV infection (respondents diagnosed with HIV had a mean knowledge score of 87%, those who last tested negative scored 77% and those who had never tested scored 67%). Thus educational and other prevention programmes need to more effectively target young and closeted MSM, and those who have never tested for HIV; these could be focus areas for the community health worker training programmes which are part of the ESTICOM Project. EMIS 2017 will collect similar information on HIV and STI related knowledge to that collected during 2010, providing updated data as well as a useful picture of trends over time.

4.3 HIV and STI testing services for MSM

Within Europe, significant proportions of HIV-positive individuals remain undiagnosed or are diagnosed late (1, 22, 228), while the availability and uptake of testing for other STIs is variable (11). In this section, we assess barriers and challenges to the uptake of testing among MSM, as well as gaps in service provision, first for HIV and then for other STIs.

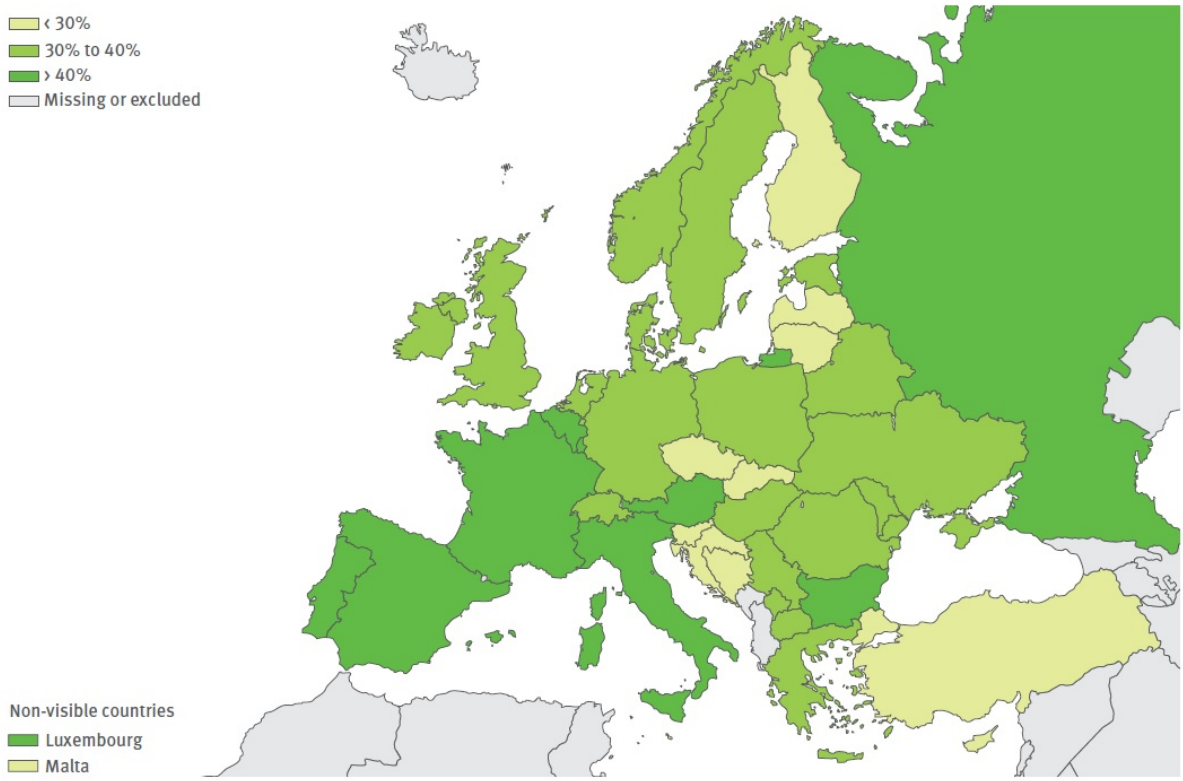
4.3.1 HIV

HIV testing serves as the gateway for access to treatment and care. It is also a pre-requisite for access to pre-exposure prophylaxis for HIV-negative individuals, while at the population level treatment of HIV-positive individuals carries the additional benefit of reducing onward transmission. In terms of prevention, evidence also suggests that HIV-positive MSM modify their behaviours after diagnosis to diminish HIV-related risks to their sexual partners (229, 230). Despite recommendations for at least annual testing of MSM in a number of European countries, significant proportions of MSM

remain undiagnosed (231), and in 2015 an estimated 37% of European MSM were diagnosed late (defined as with a CD4 cell count less than 350 cells/mm^3) (1). Late diagnosis is an important predictor of morbidity and mortality, and also increases the period during which HIV may be unknowingly transmitted.

In EMIS 2010, the proportion of men who reported ever testing for HIV varied between 43% in Lithuania and 84% in France (median 63%). The proportion who reported testing in the past 12 months varied between 20% in Lithuania and 47% in Belgium and France (median 35%). The countries with the lowest proportions of recent HIV testing (in the past 12 months) included Finland, Latvia, Lithuania, the Czech Republic, Slovakia, Slovenia, Croatia, Bosnia and Herzegovina and Turkey (see Figure 4-1). In 2016 Dublin Declaration monitoring, estimates of the proportion of MSM who tested in the previous 12 months ranged from 19% in Poland to 87% in the UK (data were available for only 22 of the 38 countries included in EMIS 2010. Data came from a range of studies with different methods and varying sample sizes, thus estimates may not be nationally representative) (10). Countries with the lowest proportions of recent testing (in the past 12 months) were Poland (19% - estimate from a sample of 17 496 MSM), Moldova (24% - sample of 250 MSM) and Latvia (27% - sample of 646 MSM), while countries with the highest proportions of recent testing included the UK (87% - sample of 127,900 MSM) and Belgium (68% - sample of 367 MSM).

Figure 4-1 Proportion of EMIS 2010 respondents who reported testing for HIV in the past 12 months*



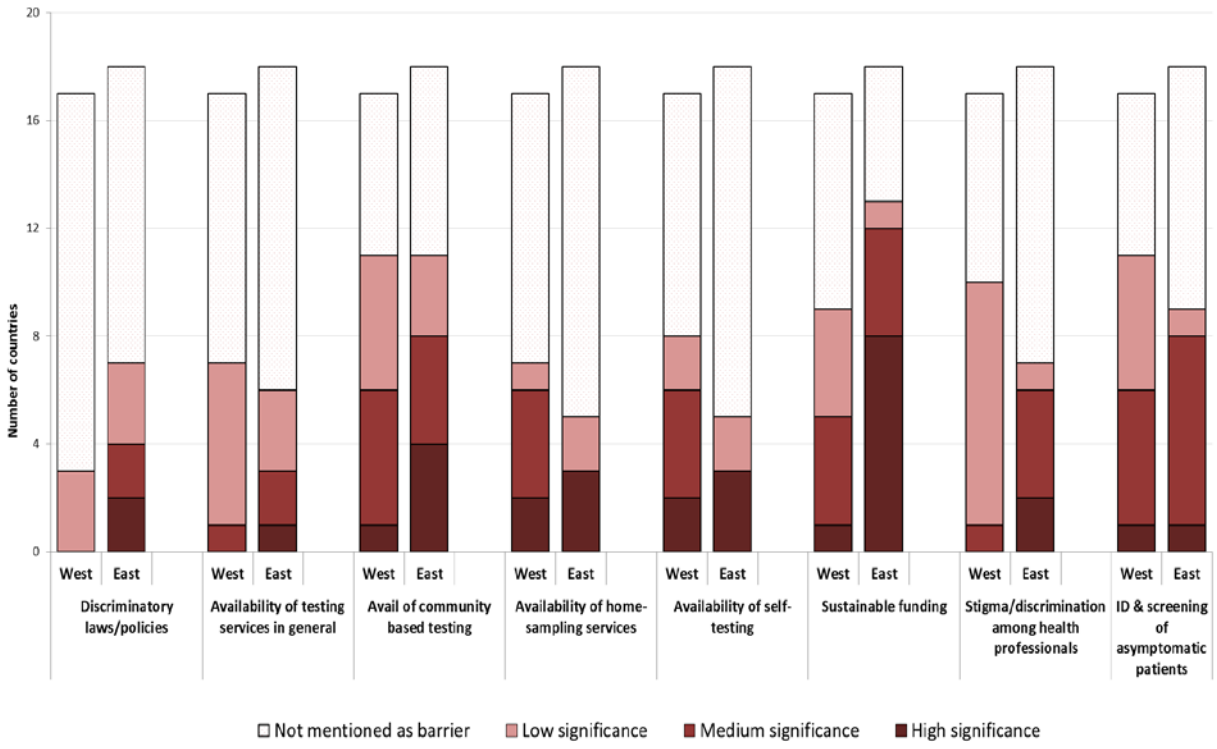
*Source: Reproduced from EMIS 2010 Technical report (11).

Several studies, including EMIS 2010 and others, have shown lower testing rates in younger men, among men living in smaller towns and villages compared to those living in larger cities. One study in Germany found that men who had never tested were more likely to be aged less than 30, to live in a settlement with less than 100,000 residents, to identify as bisexual, and to be less out – particularly towards care providers – about being attracted to men, compared to men who had tested in the previous 12 months (232). Very similar findings have been replicated in other studies in Italy (233), Spain (234) and Norway (235). The study in Germany reported that perceived risk at last anal intercourse was similar between men who had never tested and those who had recently tested. Thus the authors hypothesize that differences in HIV testing behaviours are not primarily due to differences in risk perception, but rather due to a combination of differences in numbers of partners (men who had tested had significantly higher numbers of partners in the previous 12 months), and perceived individual costs and benefits of testing.

In the German study, the most commonly cited reasons among men who had never tested for HIV included believing they were uninfected (59% of men) and having worries about confidentiality or being identified as gay or as at risk of HIV (41%) (232). When asked about the potential benefits of self-sampling or self-testing, compared to men who had recently tested, men who had never tested were two to three times more likely to mention greater anonymity and avoiding embarrassment as advantages of home testing methods. Thus reasons reflecting gay and HIV-related stigma appear to be strongly associated with testing decisions. Increasing the available range of testing options may help to increase uptake by providing alternative settings in which some MSM may be more likely to test. Marcus *et al* suggest that self-sampling or self-testing may help to lower barriers to testing, although for some MSM the potential psychosocial consequences of testing without any immediate personal support may be too great (232). Data suggest that community-based testing initiatives, often staffed and run by members of the MSM community, are well received by MSM and can achieve high rates of testing uptake (236). However, in addition to offering a variety of testing options, it will be necessary to emphasize and promote the benefits of HIV testing and of early HIV diagnosis among MSM.

In 2016 Dublin Declaration reporting, the most commonly cited barriers to providing HIV testing services for MSM included a lack of community-based testing services (mentioned as a barrier in 11 Western and 11 Eastern European countries), and the ability of healthcare professionals to identify and screen asymptomatic patients who should be tested (mentioned by 11 Western and 9 Eastern European countries) (see Figure 4-2). A lack of sustainable funding for providing testing services was also mentioned frequently, particularly in Eastern Europe where 8 countries mentioned this was a highly significant barrier, and a further 5 countries reported it was a barrier with medium or low significance.

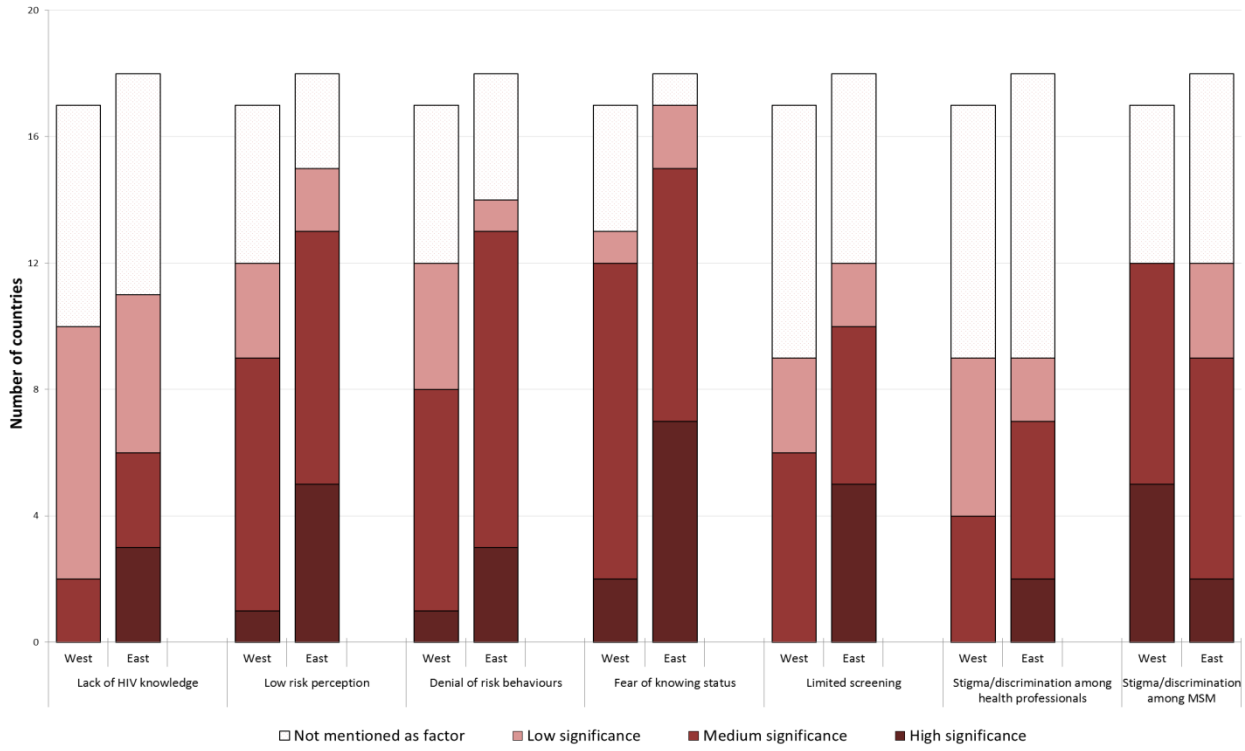
Figure 4-2 Commonly cited barriers to providing HIV testing services for MSM, by European region*



*Dublin Declaration data 2016 as provided by ECDC

Figure 4-3 shows factors cited in 2016 Dublin Declaration monitoring as contributing to late diagnosis of HIV among MSM. The most commonly cited factor was fear of knowing one's HIV status, cited by 17/18 Eastern European countries and 13/17 Western European countries. In addition to fears surrounding the potential implications of HIV-positivity for one's own health, fear of learning HIV status is likely also influenced by issues relating to gay and HIV-related stigma, such as being discriminated against upon being identified as gay, bisexual or homosexual. Healthcare professionals should be encouraged to deal with sensitive issues surrounding HIV testing and diagnosis respectfully, and to provide information and advice in a non-judgemental manner. Other factors commonly cited as contributing to late diagnosis of HIV included low perceptions of risk, and denial of risk behaviours among MSM, both cited by a slightly higher proportion of Eastern compared to Western European countries.

Figure 4-3 Factors contributing to late diagnosis of HIV among MSM, by European region*



*Dublin Declaration data 2016 as provided by ECDC

4.3.2 Addressing gaps in HIV testing service provision

Self-sampling and self-testing

New WHO guidelines recommend that countries should increase the available range of innovative HIV self-testing strategies in order to increase testing uptake (237). To date, the implementation of self-sampling and self-testing is relatively limited in Europe. According to the 'Barring the Way to Health' database[16], HIV self-sampling (i.e. taking a sample at home and posting it to a laboratory where testing is performed) is legal in 5 of the countries which were included in EMIS 2010, including Belgium, Ireland, the Netherlands, Switzerland and the UK. HIV self-testing (i.e. taking a sample and conducting the test at home) is legalized in France and an approved product is available for purchase (238). In the UK, self-testing was legalized in April 2014, and the first HIV self-testing kit was released to the market in April 2015. Initial results show that 75% of tests have been sold to people living outside urban areas, and that half of users purchasing the test had not tested for HIV before. Test orders were closely tied to external influences (e.g. World AIDS Day, National AIDS Week), with increases in orders when HIV was in the press and/or when the kit

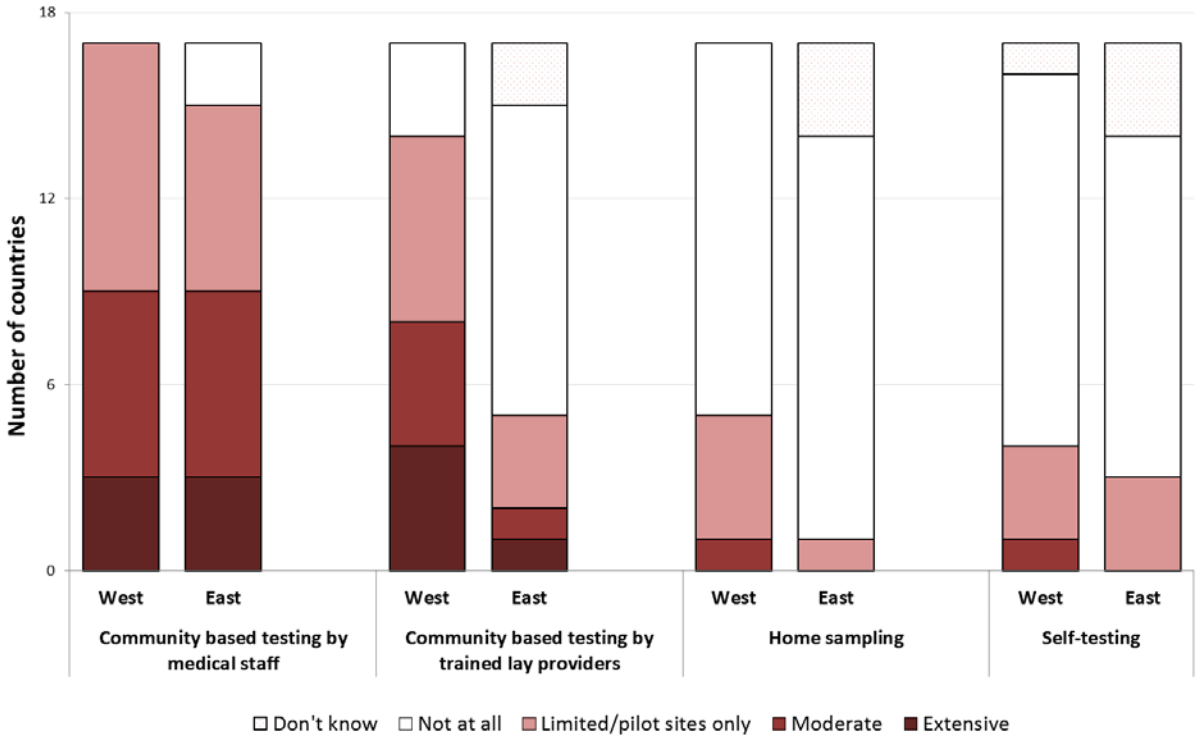
[16] http://legalbarriers.peoplewithhiveurope.org/en

was advertised through social networks (238). Qualitative research among MSM in the UK reported that the primary perceived benefit of self-testing (and to a lesser extent self-sampling) was increased anonymity for individuals who were concerned about privacy and confidentiality when testing face-to-face (239). Self-testing was also perceived to be potentially beneficial for those that were not yet out about their sexuality, such as young men, those who also had relationships with women, men living in rural areas, and those from ethnic and cultural communities where disclosure of homosexual activity remained taboo. Perceived drawbacks of self-testing included fear of having a reactive result without any immediate personal support, mens' concerns about their ability to perform the test, and cost (self-testing kits must be purchased in the UK), given that tests are available free of charge in other settings, including self-sampling.

Outside of France and the UK, the legalization and availability of HIV self-testing is limited in Europe (238). In Belgium the sale of self-testing kits is permitted, but as of mid to late 2016 no products were officially available for sale on the market, and under current policies Belgian health insurance does not cover the cost of the test. In the Netherlands guidelines on the use of self-tests have been published but no public policy has been established, and no tests have been approved for the Dutch market. In Germany current legislative provisions do not permit the sale of self-tests and they are considered 'medical devices' which must be administered by a health professional. Spain is currently considering the inclusion of HIV self-tests, but no kit has yet been authorized for sale (238). According to the 'Barring the Way to Health' database, self-testing is legal in a number of Eastern European countries (Czech Republic, Estonia, Moldova, Poland, Romania, Russia, Ukraine), however the accuracy of these data were not verified with country contacts.

Figure 4-4 shows the implementation of HIV testing services outside clinical settings, as reported in 2016 Dublin Declaration monitoring. In Western Europe, home-sampling was reported to have moderate implementation in the UK, and limited implementation or implementation in pilot sites in Belgium, Ireland, the Netherlands and Norway. Self-testing was reported to have moderate implementation in France, and limited implementation or implementation in pilot sites in Ireland, the Netherlands and the UK. In Eastern Europe, home sampling was reported to have limited implementation only in Moldova, while self-testing was reported to have limited implementation or implementation in pilot sites in Lithuania, Moldova and Ukraine.

Figure 4-4 Implementation of HIV testing services outside clinical settings, by European region*



**Dublin Declaration data 2016 as provided by ECDC. Data for Slovakia were missing.

Community-based testing initiatives

Community-based testing initiatives, particularly those staffed or co-run by members of the MSM community, are shown to be highly acceptable to MSM (240). In EMIS 2010, satisfaction with counselling was highest among men who had tested at community-based sites (11). A qualitative study conducted among MSM as part of the HIV-COBATEST project (HIV community-based testing practices in Europe, 2010-2013) found that the main perceived advantages of using community-based voluntary counselling and testing (CB-VCT) sites included ease of access (free walk-in services - in many cases no need for referrals or appointments), the use of HIV rapid tests (short time between testing and receiving the result, which is convenient but also reduces the stress and anxiety associated with a long wait for a test result), a welcoming, friendly, non-medical and unprejudiced environment where men could be open about their sexuality and receive relevant counselling advice and support from gay peers, and the anonymity and perceived confidentiality of testing at CB-VCT sites (no need to provide your name or identification, test-results not recorded in medical health insurance files) (240). The COBATEST project found that among 25 participating EU/EEA countries, almost all reported that some form of CB-VCT services were available in their country, although only 56% of countries reported having specific strategic plans for the implementation of CB-VCT (241). Furthermore, while

the majority of CB-VCT sites reported using blood-based finger prick rapid HIV tests, only 16 of 25 countries had formal recommendations regarding the use of such tests. Only 2 CB-VCT sites reported using oral fluid-based rapid tests (and 6 of 25 countries had guidelines or recommendations regarding the use of these tests). In official guidelines, non-medical staff were allowed to perform HIV tests in only 4 countries.

Under the Euro HIV EDAT Project[17] ('Operational knowledge to improve HIV early diagnosis and treatment among vulnerable groups in Europe'), an interactive toolkit to evaluate and develop quality CB-VCT services has been created[18], and further development of policies and guidelines relating to CB-VCT practices may help to improve and increase its implementation in Europe. Figure 4-4 shows the implementation of community-based HIV testing performed by medical staff or by trained lay providers, as reported in 2016 Dublin Declaration monitoring. Community-based testing by medical staff was reported to have extensive or moderate implementation in 9 Western and 9 Eastern European countries, while community-based testing by lay providers was reported to have extensive or moderate implementation in 8 Western and 2 Eastern European countries. The HIV-COBATEST project has helped to create a network of CB-VCT sites within Europe, as well as a group of core indicators which can be used to monitor and evaluate the activities of CB-VCT sites. This network forms a foundation for performing future operational research on CB-VCT services, and should help to improve their implementation and impact in terms of HIV diagnosis (and also in terms of any associated HIV or STI prevention activities).

Cost of HIV testing

In the Barring the Way to Health database HIV testing was reported as either free, or free in certain places, for 37 of the 38 countries included in EMIS 2010 (data for Slovakia were not available). However, in EMIS 2010, a median of 10.4% of participants reported that they did not believe that HIV testing was free or affordable in their country. Perceived inaccessibility of free or affordable HIV testing was highest in Lithuania (56%), corresponding with the lowest proportion of recent testers (20%). In Latvia and Cyprus, perceived inaccessibility was 31%; followed by Moldova, Romania, Turkey and Greece (25%). Thus lack of knowledge regarding where to get free (or affordable) HIV testing may serve as a barrier to uptake among MSM in some European countries.

4.3.3 STI testing

Early detection of asymptomatic STIs requires routine screening of MSM with multiple or changing sexual partners, including specimen collection (or, for anal warts, physical examination), allowing for detection of infections at sites common to men's same sex

[17] https://eurohivedat.eu/
[18] See http://msm-checkpoints.eu/content/

practices. Across Europe diagnostic services and healthcare for STIs exist within general practices and a variety of medical specialties (eg, urology and dermatovenereology) and are delivered in a range of settings (physicians in private practice, genitourinary medicine (GUM) clinics, specialised STI services within hospitals or dermatology clinics and municipal health offices). All these sites differ with respect to fees, visibility/accessibility and the services provided. A number of countries, including for example the UK, Ireland, Malta and Sweden, provide a network of open access sexual health clinics which provide free STI screening services through their national health systems. In many other European countries, physicians in private practice, including physicians specialized in infectious diseases and HIV care, play an important role in STI care. In most of the countries where the private sector plays a significant role, open access STI care is offered through municipal health offices. In large cities over the last decade, there have been an increasing number of STI services targeted at MSM and tailored to their needs (eg, Amsterdam, Athens, Barcelona, Geneva, Dublin, Hamburg, Lisbon, London, Stockholm and Zurich). Most of these venues have been set up primarily as HIV testing sites for MSM (such as Checkpoints which are part of the HIV-COBATEST network); the extent of additional STI services is variable.

In EMIS 2010, the proportions of men who thought they could access free or affordable STI testing services were variable between countries. Countries performing well in this area (i.e. >90% of men thought that free or affordable STI testing was available) included Denmark, the UK, Sweden, Norway, Finland, Luxembourg and the Netherlands. Countries with the lowest scores for this indicator included Lithuania, Moldova, Cyprus, Latvia, Greece, Turkey, Romania, Hungary and Slovakia. In another analysis of EMIS 2010 data which compared the performance of STI screening services in 40 European cities, perceived inaccessibility of STI testing (not knowing whether free or affordable STI testing was available) was lowest in Copenhagen (3.5%) and UK cities (Manchester 6.4%; Birmingham 7.4%; London 8.6%) and highest in Istanbul (65.8%; median proportion 32.6%) (40). In 2016 Dublin Declaration monitoring, a number of countries (e.g. Germany, Latvia) reported that poor access to STI services was a major gap in HIV prevention services for MSM.

In EMIS 2010, there was also wide variation in the proportion of men who reported having a test for an STI other than HIV in the last 12 months, from 20% or less in Slovakia, Turkey, Slovenia, Bosnia, the Czech Republic, and Hungary, to around 40% in Moldova, Sweden, Ireland, Belgium, France, Belarus, Russia, and the UK, and 52% in the Netherlands. In the Sialon II study, the proportions of men reporting a test for an STI other than HIV in the last 12 months ranged between 22 and 72%, being lowest for men aged <25 in Vilnius (22.7%) and highest among men aged 25+ in Brussels (72.2%) (34). In EMIS 2010, there was also wide variation in the type of testing performed. Across the 38 countries, among men who reported an STI test in the last 12 months, a median of 89% reported providing a blood sample (commonly used for diagnosis of syphilis and/or viral hepatitis), a median of 55% reported providing a urine sample and/or urethral swab (commonly used for detection of chlamydia), a median of 18% reported penile and anal inspection (for detection of viral infections such as anal/genital warts or anal/genital herpes) and a median of

16% reported that an anal swab had been performed (for diagnosis of rectal gonorrhoea or chlamydia infections). Given the relative rarity of physical examinations (i.e. penile and anal inspection, anal swabbing), STIs such as anal/genital warts, anal/genital herpes and rectal STIs are likely to be substantially underdiagnosed among MSM in many European countries. In the analysis comparing the performance of STI testing services across 40 European cities, offering anal swabs for the detection of rectal bacterial STIs, and physical inspections of the penis and anus, were best in UK cities, Dublin, Amsterdam, Oslo and Stockholm, while low performance was demonstrated for a diverse range of cities including Belgrade, Brussels, Istanbul, Lisbon, Paris, Sofia, Valencia and Warsaw. In the same study, the adjusted odds for receiving each of the four different STI diagnostic procedures (blood sample, urine sample and/or urethral swab, penile and anal inspection, anal swab) steadily increased with the number of sexual partners in the last 12 months, and were up to four times higher for men with diagnosed HIV. In addition, compared with men aged 25–39 years, younger and older men were less likely to report any STI testing.

4.3.4 Addressing gaps in STI testing service provision

Comprehensive STI diagnostic approaches can only be tailored to MSM if the individuals presenting for testing can be open about their sexuality. To facilitate this disclosure, clinical staff require skills in sexual history taking, alongside positive attitudes to sexual diversity. Increasing the available range of STI testing options may help to increase testing uptake, and community-based HIV testing sites represent locations where HIV and STI testing might be offered together as part of comprehensive services, a topic which might be covered by the Community Health Worker training programme offered as part of the ESTICOM Project.

Studies in the UK and Ireland have found that self-sampling STI testing kits are acceptable to MSM and can increase testing uptake (242-244). In one study in the UK, the uptake of a home-sampling STI testing kit (containing a urine pot, throat swab, rectal swab, and an oral fluid collection device, for detection of chlamydia, gonorrhoea, syphilis and HIV) was compared among MSM attending i) a GUM clinic for STI screening, ii) a rapid HIV testing service at a community-based organization, and iii) among HIV-positive MSM attending an HIV outpatient clinic (242). Uptake of the home-sampling kit was greatest among men attending the HIV outpatient clinic (81%), followed by men attending the community-based organization for HIV testing (66%) and men attending the GUM clinic (63%). Men were asked to return the self-collected specimens in person to either the GUM or HIV outpatient clinic. The return rate of specimens was highest among GUM clinic attendees (78%, compared to 44% among HIV clinic patients and 16% among participants at the community-based HIV testing organization). The prevalence of STIs detected by home sampling was similar among men recruited at all locations (13% for the GUM clinic and HIV clinic groups, 11% for the community clinic), demonstrating a need for STI testing among all three groups.

Another study in the UK found that the uptake of testing for chlamydia and gonorrhoea was high among MSM offered self-sampling kits or nurse-delivered testing at sex-on-premises venues, and was comparable to the uptake of STI testing among patients attending a sexual health clinic (243). In a study conducted among 94 HIV-positive MSM who collected self-samples for STI screening in Ireland, 70% stated a preference for self-sampling as they found it private and less embarrassing (51%) and easy to do (49%) (244).

4.3.5 Data that EMIS 2017 should collect

It is recommended that EMIS 2017 should contribute to an understanding of current access to HIV and STI testing services among European MSM by collecting the following data:

- Accessibility/availability of HIV testing: whether respondent knows somewhere he could get an HIV test; whether ever offered an HIV test by a health service.
- HIV testing locations: where last tested HIV-negative (if ever tested), or where diagnosed HIV-positive (including home testing and home-sampling options).
- Levels of satisfaction with support and information received as part of HIV testing.
- STI testing: what samples were taken or what investigations were performed as part of STI testing.

4.4 HIV and STI prevention interventions for MSM

In this section we discuss challenges and gaps in relation to HIV and STI prevention services for MSM. STI prevention interventions include testing, condom use, behaviour change communication, and partner notification programmes, while additional HIV-specific prevention interventions include PrEP and PEP. Because many HIV prevention interventions, such as behaviour change communication, also serve as interventions for other STIs, findings for HIV and other STIs are presented together.

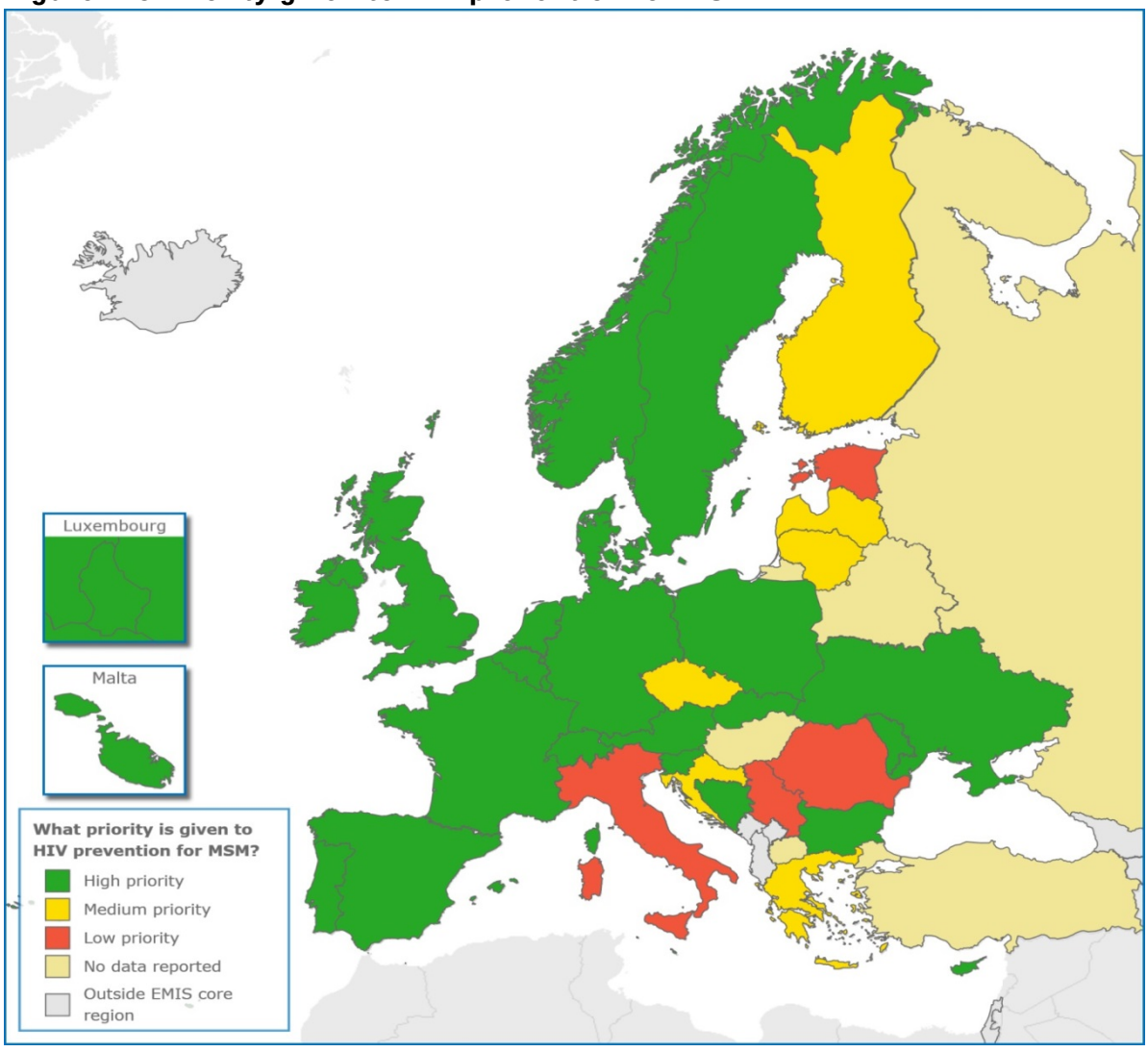
4.4.1 Barriers to providing prevention services for MSM

In analyses of data from 2016 Dublin Declaration monitoring, the majority of Western European countries (14/17) and half of Eastern European countries (9/18) reported that HIV prevention for MSM was given high priority in their country. Countries reporting that HIV prevention for MSM was given low priority included Italy, Serbia, Romania and Estonia (see Figure 4-5).

In the Sialon II study, in 8 of 13 cities more than half of men (ranging between 50.4% in Ljubljana and 88.4% in Sofia) reported yes to the two questions which form part of Global AIDS Response Progress Monitoring (GARPR) indicator 1.11, which relates to

the proportion of MSM reached with HIV prevention programme. (Question 1: Do you know where you can go if you wish to receive an HIV test? Question 2: In the last 12 months, have you been given condoms, e.g. through an outreach service, drop in centre or sexual health clinic). However, in the remaining 5 cities (Bucharest, Bratislava, Verona, Vilnius and Warsaw), the percentage of men responding yes to both these questions was less than half, ranging between 22.6% in Bratislava and 45.9% in Bucharest. Also in the Sialon II study, the proportions of men who had received an HIV test in the last 12 months and knew their result ranged between 37.2% in Bratislava and 74.3% in Sofia. With regard to STI testing, among younger respondents (<25 years), the percentage of those who reported having been tested for an STI other than HIV in the past 12 months varied between 23% and 68%. In a number of cities, although not all cities, older participants (≥25 years) reported slightly higher prevalence of STI testing in the last 12 months compared to younger men (34).

Figure 4-5 Priority given to HIV prevention for MSM*



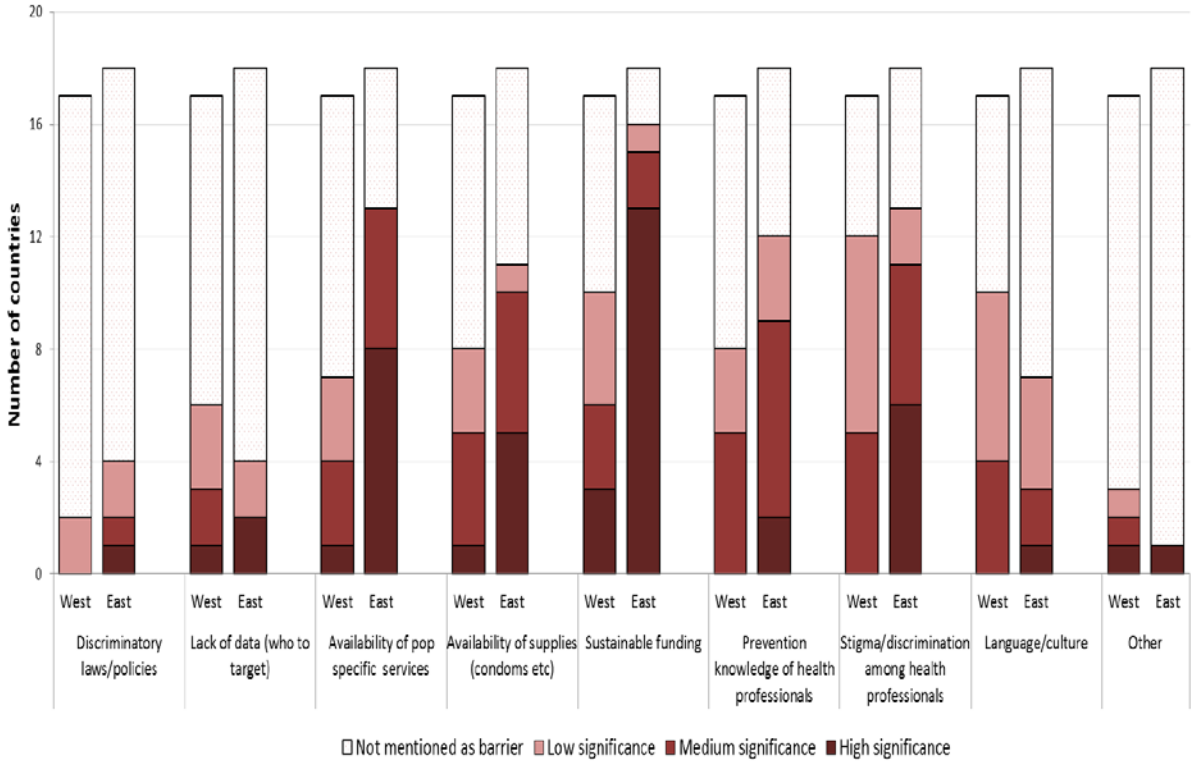
*Source: Map provided by ECDC and based on 2016 Dublin Declaration monitoring data

In the 2016 Dublin Declaration monitoring data, a commonly reported challenge or barrier to providing HIV prevention services was a lack of sustainable funding (reported by 10/17 Western European countries (3 with a high level of significance) and 16/18 Eastern European countries (13 with a high level of significance)) (see Figure 4-6). Other commonly reported barriers included stigma and discrimination among healthcare professionals (12/17 Western European countries and 13/18 Eastern European countries), and prevention knowledge and skills of healthcare professionals (8/17 Western European countries and 12/18 Eastern European countries). Thus comprehensive healthcare worker training programmes, which address the specific needs of MSM as well as issues relating to stigma and discrimination, need further support.

The availability of appropriate, population-specific prevention services was mentioned as a barrier by 7/17 Western European countries and 13/18 Eastern European countries (see Figure 4-6). In terms of HIV prevention interventions for key populations generally (not just MSM), Finland mentioned that there was a lack of political interest and will, while Serbia reported that there was a low level of awareness of the significance of HIV prevention. In the Netherlands and Italy, self-stigma and hate-speech were also mentioned as barriers to HIV prevention programmes, highlighting the importance of campaigns which aim to reduce stigma and discrimination and to promote gay, lesbian and transgender equality.

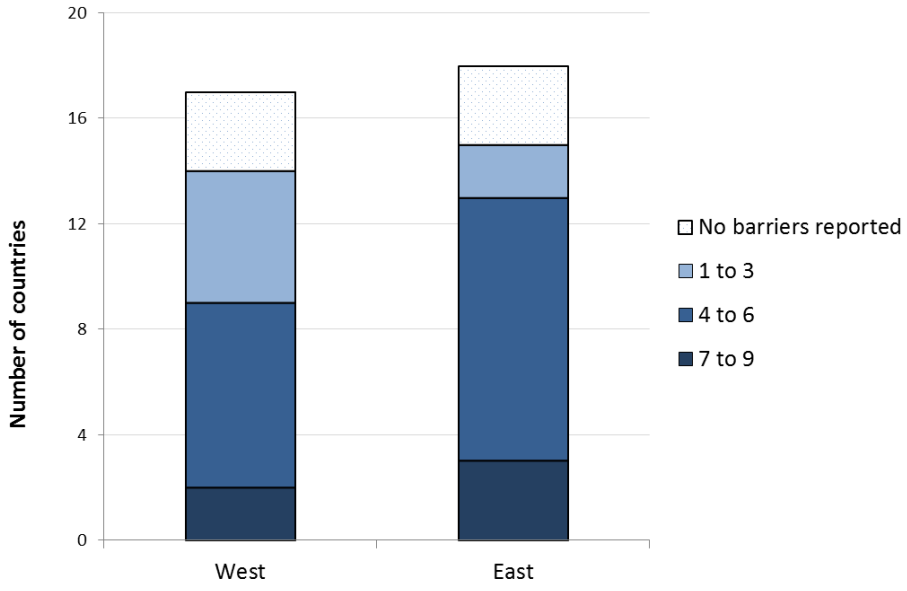
Other issues mentioned as representing major gaps in HIV prevention services for MSM in 2016 Dublin Declaration reporting included a lack of tailored services for migrants (including a lack of provision of interpreters or translators, and a lack of initiatives to address cultural barriers and/or sensitive issues, particularly for undocumented migrants), and weak sexual health education programmes in schools (e.g. a lack of focus on differences in sexuality and behavioural norms). Figure 4-7 shows the total number of barriers to providing HIV prevention services for MSM reported by countries in Western and Eastern Europe. For three countries in each of Western (Denmark, Luxembourg, France) and Eastern Europe (Hungary, Malta Turkey) no barriers were reported. All other countries reported at least one barrier.

Figure 4-6 Barriers to providing HIV prevention services for MSM, by European region*



*Dublin Declaration data 2016 as provided by ECDC

Figure 4-7 Number of barriers per country to providing HIV prevention services for MSM, by European region*



*Dublin Declaration data 2016 as provided by ECDC

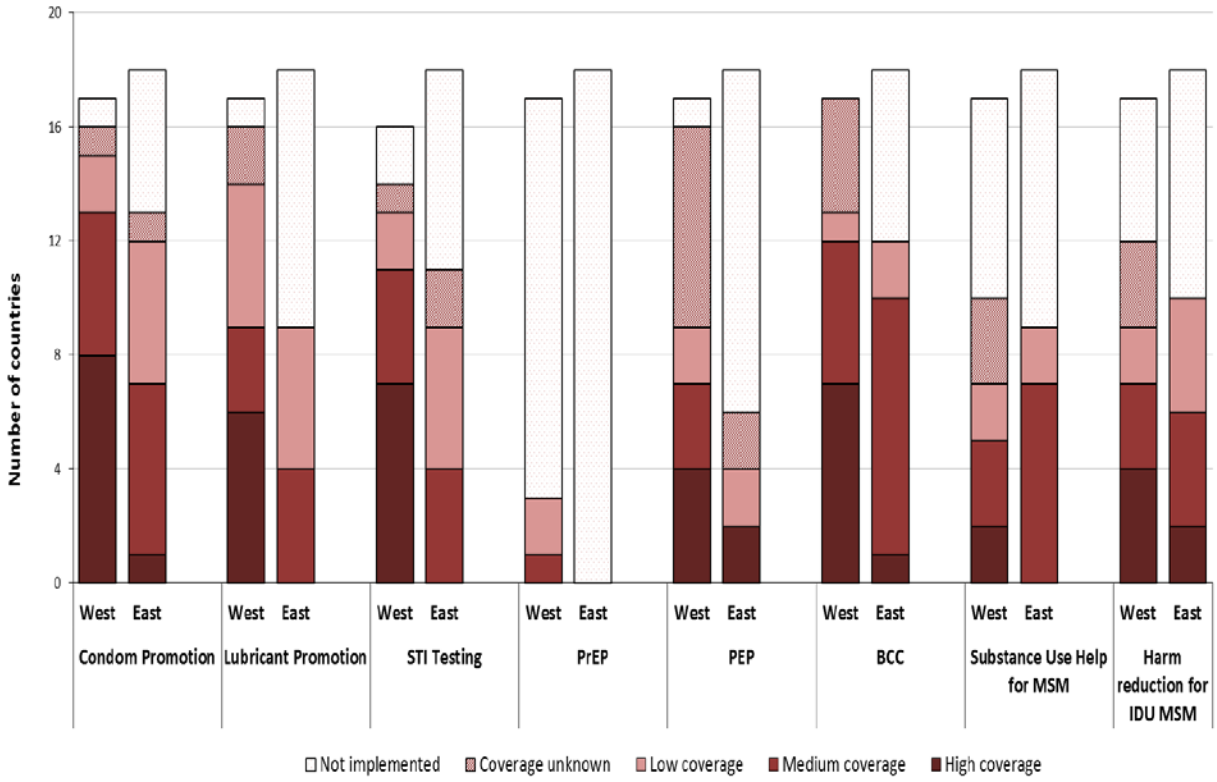
4.4.2 Implementation of prevention services for MSM

Figure 4-8 shows the extent of implementation of different HIV prevention interventions as reported in 2016 Dublin Declaration monitoring. All interventions were more commonly reported as implemented in Western compared to Eastern European countries. Condom promotion and distribution was one of the most frequently implemented interventions, occurring in 16/17 Western European countries and 13/18 Eastern European countries. Nevertheless, in EMIS 2010, overall 20% of men reported one or more instances in the past 12 months when they had wanted a condom but none was available (country range 13-35%, median 21%). Men under 25 years and men aged 25 to 39 years were more likely than men aged 40 and over to report that a condom had been needed but was not available. Not having condoms available when needed was reported most commonly in South-West Europe (Spain, Italy, Portugal, Greece) and South-East Europe (non-EU – including Bosnia and Herzegovina, Croatia, Macedonia, Serbia and Turkey), and least commonly in North-West and Central-East Europe (sub-region range 16%-29%).

In EMIS 2010, overall 13% of respondents reported having had UAI in the past 12 months solely because no condoms were available at the time (country range 8–33%, median 14%). Being younger, HIV-positive and having a lower level of education were all associated with UAI that occurred solely because no condoms were available. The highest UAI levels were reported in South-East Europe (EU and non-EU) and the lowest levels in Central-West and West Europe (sub-region range 10%-27%). Sub-optimal condom use practices (e.g. using saliva as lubricant, not using any lubricant, having intercourse for over half an hour without changing the condom) were common, reported by 42%, 35% and 19% of men who reported ever using a condom for anal intercourse, respectively. Thus improving the availability of condoms, and dissemination of information on the correct use of condoms, should be part of promotion and distribution programmes across Europe, particularly for young MSM and HIV-positive MSM.

Community-based experience suggests that providing free condoms in settings MSM frequent, ranging from venues such as saunas to health service centres, is preferable to condoms being available solely online and in stores (245). In 2016 Dublin Declaration monitoring, some countries (e.g. Italy, Greece) mentioned that there was a need for more widespread distribution of condoms in gay venues. Condom-compatible lubricants should also be made widely available, while penile dimensions and corresponding condom fit, as well as men's perceptions of condom fit and feel, should be addressed in order to minimise condom failure and promote their effective use (246).

Figure 4-8 Implementation of HIV prevention interventions for MSM, by European region*



*Dublin Declaration data 2016 as provided by ECDC

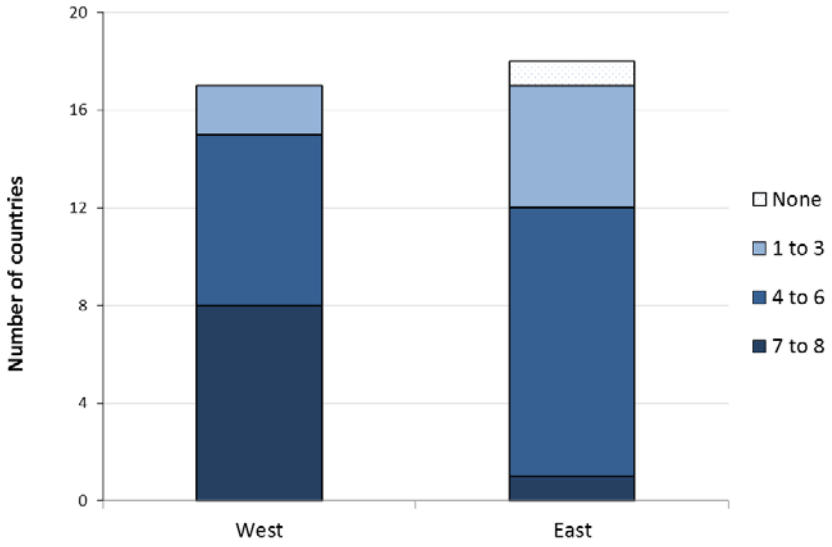
Another prevention intervention commonly reported as implemented was health promotion or behaviour change communication (all Western European countries, 12/18 Eastern European countries). Studies in the USA and Australia have shown that sexual health promotion interventions implemented at gay bathhouses or commercial sex-on-premises venues can reach MSM with high sexual risk (247, 248). Key programmatic considerations are likely to include building strong relationships with premises owners as well as the community-based organisations who may implement such interventions (246). Given that online technologies are popular tools used by MSM to meet sexual partners (11), the internet and mobile-phone based applications are also increasingly important for HIV and STI prevention. Such tools have the potential to reach large numbers of individuals, including some who may not otherwise access or use clinical or community-based services. However, there is a need for further evaluation research and efficacy data in order to guide the development of online prevention interventions for MSM in Europe (246).

As some MSM do not identify as gay or frequent MSM-specific venues, more general prevention messages in the wider community (e.g. appearing in traditional media) may also be warranted. Campaigns to promote gay, lesbian and transgender equality can also be included under this broad category, and may help to reduce stigma and homonegativity among the general population, as well as to increase the uptake of

services among MSM (246). The 2014 Global Men's Health and Rights (GMHR) study found that men who reported higher levels of engagement with the gay community were more likely to have participated in HIV prevention programmes and to have reported ever using PrEP (249). Thus peer outreach activities may help to galvanize support and to reach MSM who do not otherwise participate in online or facility-based interventions.

Figure 4-9 shows the number of HIV prevention interventions reported as implemented by countries in Western and Eastern Europe in 2016 Dublin Declaration monitoring. A comprehensive HIV response should incorporate a combination of prevention options targeted to key populations such as MSM, including behavioural, biomedical and structural interventions. In Western Europe all countries reported at least one prevention intervention for MSM, and eight countries reported seven or more (Belgium, Germany, Luxembourg, Spain, France, Norway, Switzerland and the UK). In Eastern Europe, one country (Turkey) reported no specific HIV prevention interventions for MSM, and one country (Slovenia) reported seven or more. As seen in Figure 4-8, in total 19 countries (10/17 in Western Europe, 9/18 in Eastern Europe) reported programmes to reduce HIV risks linked to substance abuse among MSM, while 22 countries (12/17 in Western Europe, 10/18 in Eastern Europe) reported offering specialized harm reduction programmes for MSM who inject non-opioid drugs. Given the observed inter-linkages between drug use, poor mental health and sexual risk behaviours (204, 209), comprehensive HIV and STI prevention programmes for MSM should include components to address these issues (see Sections 3.3 and 3.4 of this report for more on these topics).

Figure 4-9 Number of HIV prevention interventions implemented for MSM per country, by European region*



*Dublin Declaration data 2016 as provided by ECDC

4.4.3 HIV Post-exposure prophylaxis (PEP)

Historically, the use PEP as an intervention for preventing HIV infection after sexual exposure has been controversial. A brief survey conducted prior to EMIS 2010 found that PEP was available free of charge after sexual exposure in the majority of Western European countries, however this was not the case in many Eastern European countries (11). In EMIS 2010, less than 2% of respondents in 26 of the 38 countries included reported ever having accessed PEP; the remaining countries reported slightly higher use, with respondents in France reporting the highest use, still only 9% (11). In 2016 Dublin Declaration monitoring, PEP was reported as available in 16/18 Western European countries, although the extent of nationwide coverage was unknown for 7 countries, and low or medium for a further 5 countries. PEP was reported as implemented in only 6 Eastern European countries (see Figure 4-8). The low use of PEP in most European settings may be due to lack of awareness and/or lack of perceived need, however access is also an important issue, particularly in Eastern European countries. The efficacy and cost-effectiveness of PEP after sexual exposure also remains unclear, and may represent a barrier to wider uptake (11).

4.4.4 HIV Pre-exposure prophylaxis

The high efficacy of PrEP in reducing the risk of sexually acquired HIV infection has recently been shown in a number of randomized controlled trials, including two conducted among MSM in Europe (250). In July 2016 the European Medicines Agency recommended granting market authorisation for the use of antiretroviral medication for PrEP, and this recommendation was approved by the European Commission in August 2016 (251). Currently two countries in Europe, France and Norway, provide PrEP through their public health services (10). However, there is not yet clear consensus across Europe with regard to how to implement PrEP.

Demand for PrEP

Recent European studies among MSM demonstrate significant interest in using PrEP. A survey carried out on the gay social network Hornet in collaboration with ECDC in April 2016 enrolled 8,543 participants over just three days, of whom 26% were recruited in France, 22% were recruited in the UK and 10% were recruited in Russia (the remaining participants came from a variety of European countries) (251, 252). Among 8,048 participants who did not report being HIV-positive, 10% (n=793) said that they were currently taking PrEP. The majority of respondents from France indicated that they had acquired PrEP through their physician or doctor. For those currently on PrEP outside of France, the primary source of obtaining PrEP was purchase via the internet, followed by receipt from a physician or doctor (possible off-label prescription, or use of PEP drugs for PrEP), or through a research study. In the Hornet/ECDC study overall, approximately one in four of those not currently on PrEP agreed with the statement that they were likely to use it within the next six months.

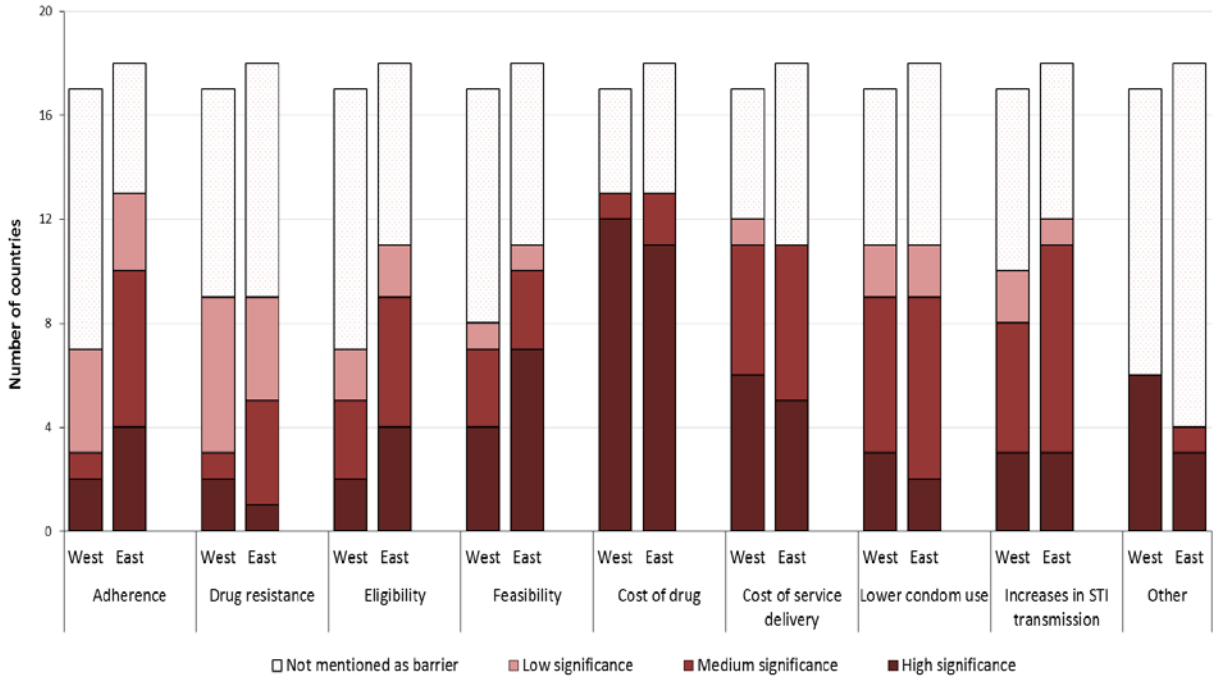
Another study, the 'Flash PrEP in Europe' online survey, ran across 12 European countries between June and July 2016 and enrolled 15,880 people (10,522 of whom were recruited in Germany), including 14,689 men, 907 women, and 284 individuals with a transgender, other or unknown gender identity (253). Among men living in Germany (n=10,288, approximately 75% of whom reported having sex with men in the last six months, with a further 21% reporting no sexual partner in the past six months), 80% said they felt PrEP should be used as part of a comprehensive HIV prevention package (e.g. in addition to HIV testing, STI testing, peer support), and 44% said that they would be interested in using PrEP. Among those who had knowledge of PrEP prior to completing the survey, 4% (n=147) were currently taking PrEP (which was received either from an HIV-positive friend, via a physician or doctor as an off-label prescription, or by taking tablets intended for PEP as PrEP). Among male participants living outside Germany (n=4,401, approximately 80% of whom reported having sex with men in the last six months, with a further 17% reporting no sexual partner in the past six months), 85% said they felt PrEP should be used as part of a comprehensive HIV prevention package, and 54% said that they would be interested in using PrEP. The significant interest in using PrEP among MSM in Europe (roughly a quarter of participants in the Hornet gay social network study, and roughly half of participants in the PrEP Flash survey) demonstrates the high potential acceptability of this HIV prevention intervention.

Barriers to implementation of PrEP

Figure 4-10 shows barriers to PrEP implementation as reported in 2016 Dublin Declaration monitoring. Recognised gaps and uncertainties include a lack of data on the size of key target populations, costs of implementation (cost of the drug as well as of service delivery), a lack of licensing or approval of drugs for use, drug side-effects, options for service delivery, concerns about adherence, drug failures and drug resistance, concerns about the impact of PrEP on sexual risk behaviours and the incidence of other STIs, and socio-political issues (e.g. not considered a priority intervention). Despite this, there is broad consensus within Europe that PrEP should be made available to key populations at highest risk of HIV, as part of a combined HIV prevention approach (251).

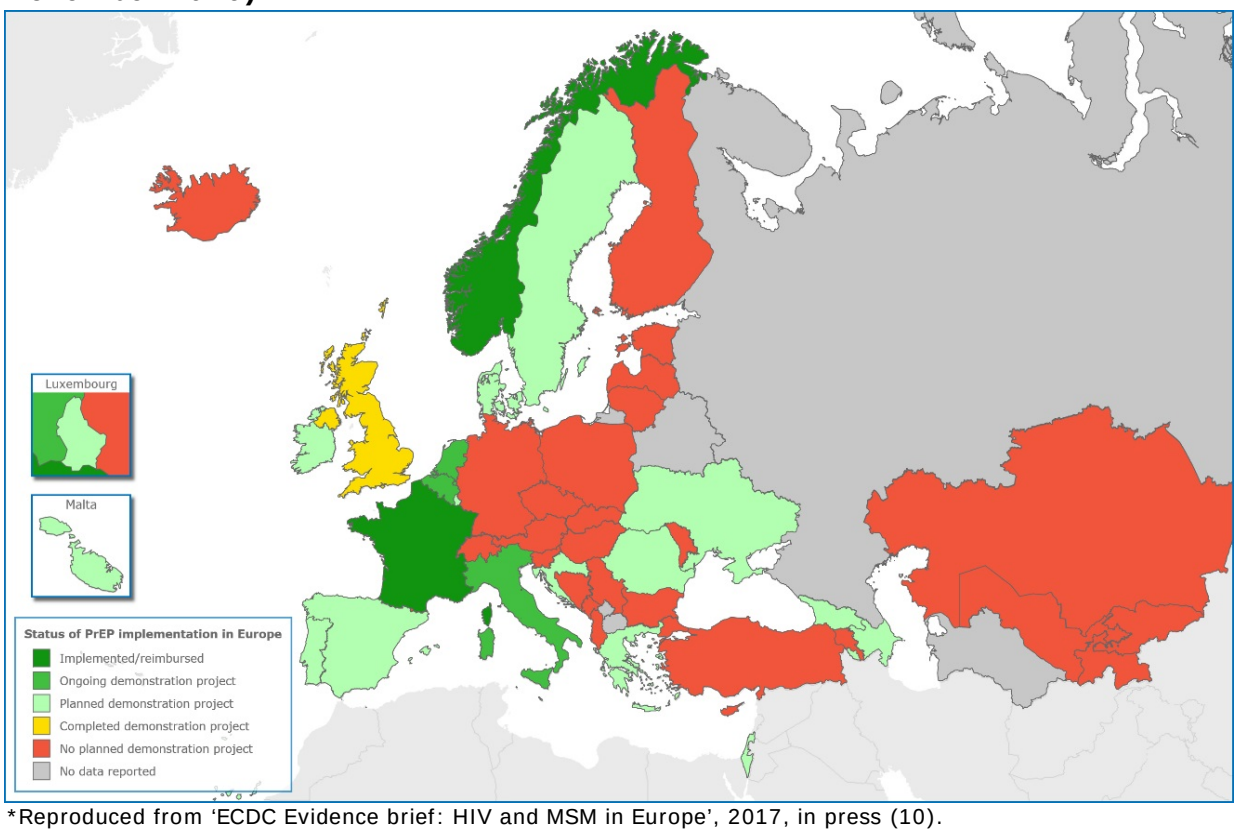
A number of European countries (Belgium, the Netherlands, UK and Italy) have ongoing or complete PrEP demonstration projects (see Figure 4-11). In most countries these projects are being undertaken with MSM (with exception of the study in Italy, which includes HIV-negative women seeking to conceive with an HIV-infected partner). In 2016 Dublin Declaration monitoring, a further 11 countries stated that PrEP implementation or PrEP pilot projects were being planned or considered (Croatia, Denmark, Greece, Ireland, Luxembourg, Malta, Portugal, Romania, Spain, Sweden, Ukraine) (see Figure 4-11). In Dublin Declaration monitoring, fourteen countries reported that they had initiatives to educate at least one stakeholder (policy makers, health ministries, health professionals or potential PrEP users) about the use of PrEP for HIV prevention.

Figure 4-10 Issues limiting or preventing implementation of PrEP, by European region*



*Dublin Declaration data 2016 as provided by ECDC

Figure 4-11 Status of PrEP implementation in Europe and Central Asia (as of November 2016)*



*Reproduced from 'ECDC Evidence brief: HIV and MSM in Europe', 2017, in press (10).

4.4.5 Data that EMIS 2017 should collect

It is recommended that EMIS 2017 should collect the following information relating to HIV and STI prevention among MSM:

- Data on knowledge about HIV and STI transmission.
- Data on condom use (behavioural data – see Section 3.6).
- Data on PEP (knowledge of PEP, whether respondent has ever tried to get PEP, or ever taken PEP).
- Data on PrEP (knowledge of PrEP, whether respondent has ever been offered PrEP, ever tried to get PrEP or ever taken PrEP, and respondent's likelihood of using PrEP if it were made available).

4.5 HIV treatment services for MSM

In this section we present data on HIV treatment coverage among MSM as measured in EMIS 2010, the Sialon II bio-behavioural study and 2016 Dublin Declaration monitoring. We also discuss challenges and gaps in ART service provision for MSM in Europe.

4.5.1 HIV treatment coverage

Guidelines regarding when to start ART have changed in recent years. In 2015, the WHO recommended immediate initiation of ART for all HIV-positive persons upon diagnosis regardless of immunological status (254). However, country-level implementation of these guidelines varies. In 2016 Dublin Declaration monitoring, 13/17 countries in the EMIS 2010 Western European region and 10/18 countries in the EMIS 2010 Eastern European region reported immediate initiation of ART among HIV-positive persons (in practice, as opposed to what might be recommend in guidelines) (see Table 4-2).

Table 4-2 ART initiation practices reported by countries in 2016 Dublin Declaration monitoring*

	Western Europe	Eastern Europe
Initiation regardless of CD4 count	Czech Republic, Denmark, Finland, Spain, Sweden, France, Portugal, Norway, Switzerland, Austria, Netherlands, Italy, UK	Croatia, Cyprus, Estonia, Hungary, Poland, Serbia, Slovakia, Slovenia, Malta, Romania
≤500 cells/mm^3	Luxembourg, Belgium	Bulgaria, Ukraine, Moldova
≤350 cells/mm^3	Germany**, Ireland	Bosnia & Herzegovina, Lithuania, Turkey
≤200 cells/mm^3		Latvia
No data reported	Greece	

*Dublin Declaration data 2016 as provided by ECDC. Data represent reported treatment thresholds in practice, rather than what policy guideline states.
**Germany policy guideline was updated to immediate initiation regardless of CD4 count in March 2016.

At the time of EMIS 2010, treatment guidelines recommended initiating ART among patients with AIDS-defining illnesses or at CD4 counts ≤ 350. The proportions of HIV-positive MSM who reported receiving ART varied from 37% in Latvia to 85% in Denmark (median across 38 countries: 67%). At the individual level, no associations were found between receiving ART and level of education, employment status, sexual identity, not being born in the country of residence or, surprisingly, settlement size. In the Sialon II study, the proportion of HIV-positive men aware of their serostatus who were on ART ranged from 18% in Bucharest (where the sample included a high proportion of IDUs) to 100% in Stockholm and Warsaw (median across 10 cities: 95.1%) (34).

In EMIS 2010, the proportions of men who reported that they had had their HIV infection monitored within the last 6 months ranged from 71% in Ukraine to 97% in Luxembourg (median 93%), and similarly to access to ART, there were no associations between access to HIV monitoring and age, level of education, employment status, sexual identity, not being born in the country of residence or settlement size. In Scandinavia and the Baltic countries access to HIV monitoring was strongly associated with outness. However, the numbers of respondents with diagnosed HIV were small in these two regions, so confidence intervals were wide and it was recommended that these findings be further explored in national or regional analyses.

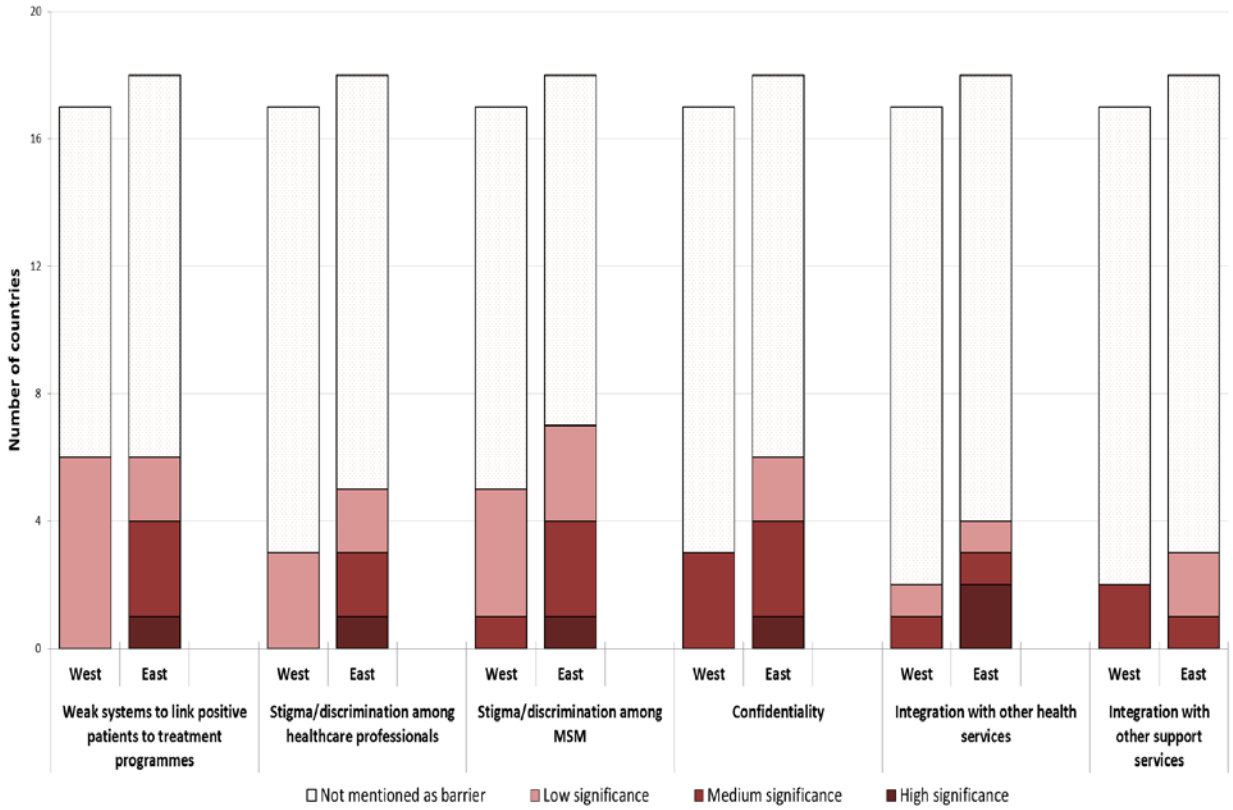
4.5.2 Reasons for not taking ART

In EMIS 2010, in total 13,353 participants reported having diagnosed HIV infection, of whom 9,484 (71%) were currently taking ART, 278 (2.1%) had done so in the past but had stopped taking it, and 3,391 (25.4%) had never taken ART (for 1.5% of participants treatment status was unclear). Among those who had never taken ART, overwhelmingly the most commonly reported reason (reported by 87.7%) was because their doctor did not recommend it yet. The next two most commonly reported reasons were feeling it was not necessary (8.7%), and to avoid side effects (6.6%). Among men who had taken ART in the past but then stopped, similarly to men who had not yet started ART, the most commonly reported reason was a physician's recommendation (63.6%). However, 28.7% of those who stopped treatment did so because of side effects, and 15.1% indicated fatigue at taking daily pills. In a factor analysis combining reasons for never taking or for having stopped taking ART, men living in the WHO Central and Eastern European Regions were more likely than men living in Western Europe to feel that treatment was not yet necessary (either because their doctor didn't recommend it or because they themselves didn't feel it was necessary), to be afraid of side effects, to be unwilling to be reminded about HIV every day, or to be afraid of people noticing they have HIV. They were also more likely to state that they could not afford treatment, or that the treatment was not available in the country where they lived. However overall, lack of availability or affordability of ART was reported infrequently (<3%) as a reason for not taking ART by EMIS participants (255).

4.5.3 Barriers to getting HIV-positive MSM onto treatment

In 2016 Dublin Declaration monitoring, the most commonly reported barriers to getting HIV-positive MSM onto treatment included weak referral systems to link people to treatment programmes (reported as a barrier in 6/18 Eastern European countries (1 with high significance) and 6/17 Western European countries (all with low significance) – see Figure 4-12). Stigma and discrimination within the MSM population was reported as a barrier in 7 Eastern European countries (1 with high significance) and 5 Western European countries. Other less frequently reported barriers included stigma and discrimination among healthcare professionals, confidentiality concerns, and lack of integration with other healthcare or support services (see Figure 4-12).

Figure 4-12 Main barriers to getting HIV-positive MSM onto treatment, by European region*



*Dublin Declaration data 2016 as provided by ECDC.

4.5.4 HIV continuum of care

Data on the HIV continuum of care among MSM were available for 12 cities participating in the Sialon II bio-behavioural study (see Figure 4-13. Data for Vilnius were not included due to small sample sizes) (34). The strength of these data is that estimates for each stage of the continuum have come from the same rather than different study populations. However, weaknesses include that sample sizes were small, particularly for some cities (e.g. based on less than 15 HIV-positive men for Bratislava, Ljubljana, Sofia and Stockholm), and it is worth bearing in mind some of the limitations associated with the sampling methodologies (time-location sampling in 9 cities, respondent-driven sampling in 4 cities). Time-location sampling recruited participants at gay social venues, while respondent-driven sampling used a chain-referral approach, recruiting participants from within the social networks of purposefully selected 'seeds'. While these methods are useful for sampling hard to reach populations, they are known to over-represent young MSM, who may be less likely to have tested for HIV (11). Thus the proportions of HIV-positive individuals who had been diagnosed that are presented in Figure 4-13 may be underestimates relative to true figures. Time-location sampling may also have recruited fewer HIV-diagnosed individuals because such men may be less likely to visit social venues after becoming

aware of their HIV status. An additional important point is that the sample of MSM recruited in Bucharest via respondent-driven sampling included a large proportion of IDUs, who may be different to non-IDUs with respect to access to and uptake of HIV testing and treatment.

Although these biases may have overemphasized drop-off across the continuum of care, particularly at the first stage (i.e. between the total number of HIV-infected men and those who were diagnosed), a fairly consistent finding across all cities was that drop-off was largest at this stage. This is similar to recently published findings from a study looking at drop-off across the continuum of care among HIV-positive individuals across Europe (256). In the Sialon II study, reductions between the proportion of men living with HIV and those diagnosed exceeded 60% in some cities, including Bratislava, Lisbon, Sofia, Stockholm and Warsaw (see Figure 4-13). Drops at the level of linkage to care (i.e. between those diagnosed and those on treatment) were smaller, with the exception of Bucharest (where a large proportion of participants were IDUs). The proportions of all HIV-positive men who were treated and had an undetectable viral load ranged from 0% in Bucharest and Sofia to 79.6% in Brussels. In general, the Sialon II study found that the proportions of men who were diagnosed, on treatment and who had an undetectable viral load were greater in Western compared to Eastern European cities, with the exception of Lisbon (where a large proportion of study participants lived outside the city or were tourists or visitors).

Figure 4-13 HIV continuum of care for 12 cities included in the Sialon II study*

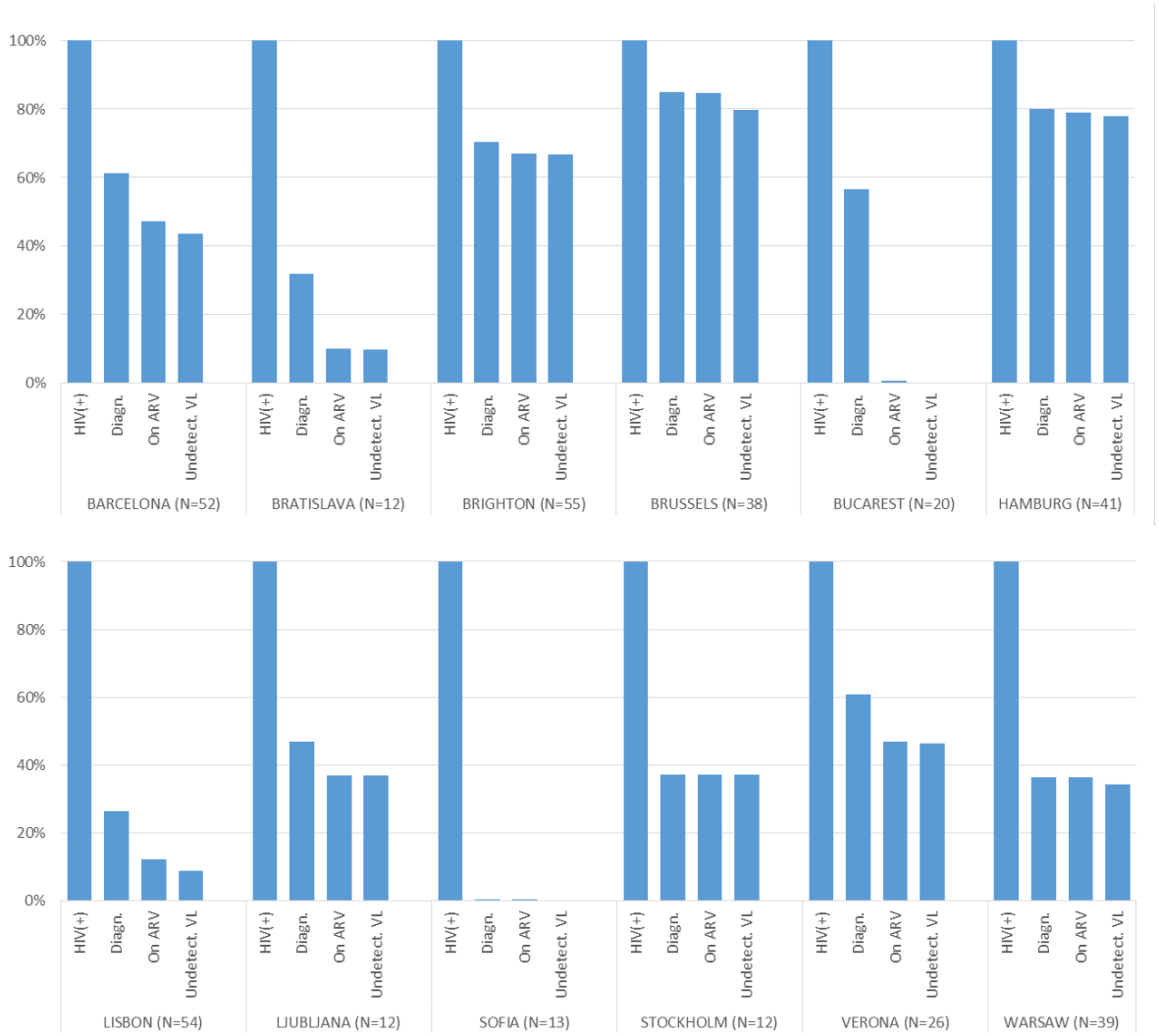


*Figure reproduced from: The Sialon II Project - Report on a Bio-behavioural Survey among MSM in 13 European cities (34). Data for Vilnius not included due to small sample sizes.

In EMIS 2010, the proportions of all HIV-diagnosed respondents on ART who reported having an undetectable viral load at their last medical monitoring could be robustly estimated for 5 countries (for other countries, sample sizes were small). These proportions were 74% in Italy, 80% in Germany, 81% in Spain, 83% in the UK and 86% in France. Age had the strongest influence on effectiveness of treatment: undetectable viral loads were reported by 70% in the age group 20–29 years (n=543), by 79% in the age group 30–39 years (n=1,958), by 83% in the age group 40–49 years (n=3,198) and by 84% in the age group 50 years and older (n=1,301). Level of educational attainment was also significantly associated with effectiveness of treatment (aOR=1.33; 95%-CI: 1.18–1.51).

4.5.5 Data that EMIS 2017 should collect

It is recommended that EMIS 2017 should collect the following data on HIV treatment and care among MSM:

- Number/proportion of HIV-positive men who have ever seen a health professional for monitoring their HIV infection (and recency of this, if so).
- Number/proportion of HIV-positive men who have ever taken ART.
- Data on the length of time between HIV diagnosis and starting treatment.
- Reasons for not taking ART
- Result of last viral load monitoring (whether detectable or undetectable).

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6 Appendix - Countries included in EMIS 2010 sub-regions

Western European sub-regions:

West – Belgium, France, Republic of Ireland, Netherlands, United Kingdom

North-West – Denmark, Finland, Norway, Sweden

Central-West – Austria, Switzerland, Germany, Luxembourg

South-West – Spain, Italy, Portugal, Greece

Eastern European sub-regions:

North-East – Estonia, Lithuania, Latvia

Central-East – The Czech Republic, Hungary, Poland, Slovenia, Slovakia

South-East (EU) – Bulgaria, Cyprus, Romania, Malta

South-East (non-EU) – Bosnia and Herzegovina, Croatia, the former Yugoslav Republic of Macedonia, Serbia, Turkey

East – Belarus, Moldova, Russia, Ukraine

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