



TECHNICAL REPORT

Chlamydia control in Europe – a survey of Member States

2012

ECDC TECHNICAL REPORT

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This report was commissioned by the European Centre for Disease Prevention and Control (ECDC) and coordinated by Otilia Sfetcu, Marita van de Laar and Andrew J. Amato-Gauci. Jan van Bergen and Marianne van der Sande (National Institute of Public Health (RIVM) and STI/AIDS Foundation, the Netherlands) supervised the survey group; Ingrid van den Broek (National Institute of Public Health (RIVM), the Netherlands) managed the data collection, analysed the data, wrote the first draft of the report and revised the report. Experts on the survey team, including Helen Ward (Imperial College London, London UK); Anneli Uusküla (University of Tartu, Tartu, Estonia), Berit Andersen (Randers Regional Hospital, Denmark), Hannelore Götz (Municipal Health Service, Rotterdam, The Netherlands), Björn Herrmann (University of Uppsala, Uppsala, Sweden) and Sarah Woodhall (Public Health England, London, UK), contributed to the design and interpretation of the survey, commented on the draft report and approved the final report. Shelagh Redmond (Institute of Social and Preventive Medicine, University of Bern, Bern, Switzerland) provided technical support. Nicola Low (University of Bern) led the Chlamydia Control in Europe project, revised the draft report contributed to the design and interpretation of the survey, revised the draft report and approved the final report.

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Contents

Abbreviations	v
Executive summary	1
Introduction	4
Background.....	4
Survey methods.....	7
Survey implementation and analysis	8
Response rate	10
Key indicators.....	10
Assessment of chlamydia prevention and control activities.....	27
Linking survey responses with secondary data sources.....	33
Additional data collected in the 2012 survey.....	35
Discussion	36
Summary of main findings.....	36
Strengths and limitations.....	36
Interpretation of results	37
Considerations for programme improvements.....	38
References	39
Glossary of terms used in the questionnaire	42
Appendices.....	44

Figures

Figure 1. EU/EEA countries with a strategy or plan about STI control (A) in 2007 and (B) 2012.	11
Figure 2. Map of the EU/EEA indicating the proportion of chlamydia tests performed with NAAT in (A) 2007 and (B) in 2012	22
Figure 3. Number of EU/EEA countries in each category of chlamydia control activities in 2007 and 2012.	30
Figure 4. Category of chlamydia control activities (A) in 2007 and (B) 2012 in the EU/EEA	31
Figure 5. Chlamydia control level in the EU/EEA, 2012 country self-assessment.	33
Figure 6. Level of chlamydia control in the EU/EEA by GDP per capita in US\$ (2012) and by country.....	34

Tables

Table 1. Categories of chlamydia control activities, situation in 27 EU/EEA Member States in 2007	6
Table 2. Correspondence between categories defined in SCREEn project survey 2007 and levels defined in ECDC guidance document 2009.....	7
Table 3. Topic headings and key indicators for chlamydia control activities.....	8
Table 4. Countries invited to take part in the survey of chlamydia prevention and control in 2012	9
Table 5. Availability of a national strategy or plan on STI control.....	10
Table 6. Health promotion policies or educational programmes for primary prevention.....	12
Table 7. Numbers of Member States with guidelines in 2007 and 2012 and guideline audience	13
Table 8. Case management guidelines addressing partner notification and prevention advice	14
Table 9. Methods for partner notification in Member States where case management guidelines address partner notification	15
Table 10. Opportunistic chlamydia testing, as recommended in guidelines and in practice	17
Table 11. An organised programme that offers screening to a substantial part of the population, in place or in preparation, as reported in the 2012 and 2007 questionnaires	18
Table 12. Member States with both public healthcare services for chlamydia diagnosis and treatment and STI guidelines that address chlamydia diagnosis in symptomatic people	19
Table 13. Percentage of chlamydia tests analysed using NAAT	21
Table 14. Participation in a quality assurance programme for molecular diagnostic tests.....	23
Table 15. Surveillance systems for reporting chlamydia cases	24
Table 16. Data about complications associated with chlamydia infection	25
Table 17. Member States' self-assessed level of chlamydia control.....	27
Table 18. Category of chlamydia control activities assigned to the 28 participating EU/EEA Member States	29
Table 19. Comparison between 2007 and 2012 categories of chlamydia control activities	30
Table 20. Category of chlamydia control activities assigned by survey team (categories 1 to 5) compared with country self-assessment (levels A to D).....	32

Table 21. Type of surveillance system for chlamydia and chlamydia cases per 100,000 population reported to TESSy in 2011, by category of chlamydia control	35
Appendix Table 1. Sections of the questionnaire in 2012	44
Appendix Table 2. Questions used to assess key indicators and self-assessed level of chlamydia prevention and control activities.....	44
Appendix Table 3. Documents sent by survey respondents with the questionnaire, by country and topic	46
Appendix Table 4. Overview of primary prevention strategy, activities and target groups.....	48
Appendix Table 5. Chlamydia case management guidelines available, by country.....	51
Appendix Table 6. An overview of the partner notification recommendations per guideline per country; inclusion in case management guidelines and methodology recommended.....	52
Appendix Table 7. Coverage of costs for chlamydia case management.....	54
Appendix Table 8. Most common provider of chlamydia testing, availability of chlamydia case management guidelines, PN recommendations and surveillance/monitoring information collection from the specific settings	55

Abbreviations

CSW	Commercial sex worker
EEA	European Economic Area
EFTA	European Free Trade Association
EU	European Union
GDP	Gross domestic product
GUM	Genitourinary medicine
HIV	Human immunodeficiency virus
IVF	in-vitro fertilisation
MSM	Men who have sex with men
NAAT	Nucleic acid amplification test
PID	Pelvic inflammatory disease
PN	Partner notification
SCREen	Screening for Chlamydia Review in Europe project
RCT	Randomised controlled trial
STI	Sexually transmitted infection
TESSy	The European Surveillance System
WHO	World Health Organization

Executive summary

Background

Chlamydia trachomatis (chlamydia) is a priority for infectious disease prevention and control in several European Union (EU) Member States. Chlamydia, the most commonly reported infection in the EU, affects mostly young heterosexual adults. Untreated chlamydia infection can cause a range of complications in the genital tract and increases the transmissibility of HIV infection.

The first ECDC report on activities to control chlamydia in the EU and European Economic Area (EEA) Member States was issued in 2007. A 2009 ECDC document that guided Member States in developing national plans to control chlamydia infection was based on those findings. A technical report that summarises the most recent evidence about the population prevalence of chlamydia, the long-term complications of the infection, and the effectiveness and cost-effectiveness of chlamydia screening was published in 2014.

The report that follows is part of the evaluation of chlamydia prevention and control activities in Europe. The report presents the second ECDC survey, which was carried out in 2012 to describe chlamydia prevention and control activities, changes in activities between 2007 and 2012, and suggests recommendations to improve chlamydia prevention and control in EU/EEA Member States.

Methods

The 2012 survey tool was a structured questionnaire that included 63 questions in six main sections:

- guidelines on chlamydia case management and testing
- laboratory diagnosis
- strategies, plans and organisation of care for sexually transmitted infection control
- strategies, plans and activities for primary prevention
- surveillance
- chlamydia screening programmes.

Key questions from the 2007 survey were retained. Questions were added to address new topics, including an assessment by respondents of their own country's chlamydia prevention and control activities in four levels (A to D) that were broadly comparable to those in the 2009 ECDC guidance document. The survey team conducted an independent assessment, assigning Member States to one of five categories defined in the 2007 survey. Category 3, assigned to Member States with chlamydia case management guidelines that included recommendations for partner management, was defined as a minimum EU/EEA target level for chlamydia control activities (broadly corresponding to level B). The survey team analysed and reported results according to 13 pre-defined indicators that summarised specific chlamydia prevention and control activities.

Experts in sexually transmitted infection surveillance and control from each Member State completed the questionnaire between December 2012 and February 2013, reviewed the results and responded to queries in November 2013.

Results

Twenty-eight of 30 EU/EEA countries responded to the survey (93%). Their responses for the key indicators (more information on these indicators can be found on page) are summarised as follows:

- Strategy or plan for sexually transmitted infection control (Indicator 1): 11/28 countries have a strategy or plan; six of these documents explicitly include chlamydia control.
- Primary prevention to improve knowledge about and awareness of chlamydia (Indicators 2 and 3): 22/27 countries that responded to this question report organised activities, including regular general media campaigns for the general population (six countries) and school education on sexual health and prevention of sexually transmitted infections (11 countries).
- Chlamydia case management guidelines (Indicator 4): 22/28 countries have at least one national guideline that covers chlamydia diagnosis and treatment for use by one or more medical professional groups.
- Partner notification and prevention advice (Indicator 5): 19/28 countries address partner notification in their case management guidelines and in 9/28 countries, the guidelines include guidance about offering advice to prevent future infection.
- Opportunistic chlamydia testing (Indicator 6): in 18/28 countries clinical guidelines recommend chlamydia testing for one or more specific groups of asymptomatic people. Target groups for testing include pregnant women (10 countries), young people (10 countries) and groups at high risk of chlamydia such as men who have sex with men (6 countries), commercial sex workers (3 countries) and migrants (1 country).

- Chlamydia screening programmes (Indicator 7): one country (England, UK) has an organised programme fulfilling the project's definition. The Netherlands stopped a pilot screening programme in 2012 after a trial concluded that it was not clinically or cost-effective. Germany has reimbursed chlamydia screening tests for young women since 2008, which corresponds to the project's definition of opportunistic testing. Three countries (France, Luxembourg and Malta) report plans to introduce chlamydia screening programmes.
- Provision of care for people with sexually transmitted infections (Indicator 8): 25/28 countries have specialised healthcare services and/or other providers offering care for sexually transmitted infections within the general health system. In 26/28 countries, the cost of diagnosis and treatment is covered or partially reimbursed by the healthcare system.
- Reliable diagnostic tests for chlamydia (Indicators 9 and 10): nucleic acid amplification tests (NAATs) for chlamydia diagnosis are available in all countries that participated in the survey; in 23/28 countries this method is used for more than 90% of diagnoses; 22/28 countries participate in an international quality assurance programme.
- Surveillance of chlamydia infections (Indicators 11–12): 26/28 countries report a system to report and monitor diagnosed chlamydia cases.

Twenty seven Member States completed a self-assessment of their level of chlamydia control. Their assessments were: level A, activities for the primary prevention of sexually transmitted infections but no other organised chlamydia control activities, 22% (6/27 countries); level B, clinical guidelines for chlamydia case management, 33% (9/27); level C, opportunistic testing, 26%, (7 countries); level D, organised screening programme, 7% (2/27). Three countries (15%) reported that they do not fit into any of the levels described.

The survey team's assignments were:

- category 1 - no organised chlamydia control activities, 21% (6/28 countries)
- category 2 - national chlamydia case management guidelines, 11% (3/28)
- category 3 - case management guidelines that include recommendations for partner notification, 24% (5/28)
- category 4 - opportunistic testing of selected groups of asymptomatic individuals, 46% (13/28)
- category 5 - organised chlamydia screening programme, 4% (1/28).

Amongst 25 Member States that took part in both surveys, more countries in 2012 (72%, 18/25) had chlamydia control activities in at least category 3 than in 2007 (44%, 11/25).

Member States with opportunistic chlamydia testing or an organised screening programme report more diagnosed chlamydia cases than Member States with less intensive chlamydia control activities. As in 2007, there was no statistical evidence of an association between the category of chlamydia control and per capita gross domestic product.

Discussion

The 2012 survey of chlamydia prevention and control activities had a high survey response rate. A strength of the 2012 survey is that it included questions about new topics whilst retaining comparability with data from 2007 (25 EU/EEA Member States took part in both surveys).

There are limitations to the results and interpretation of the survey. The survey questionnaire was long and covered many different specialist topics. It is possible that the STI experts who responded misunderstood or misinterpreted some questions, even though definitions were supplied. There were also some changes to questions and to the survey format between 2007 and in 2012 that might have affected the comparability of the findings.

Overall, the infrastructure for chlamydia prevention and control activities has most likely increased in 2012 compared to 2007. More Member States in 2012 than in 2007 reported organised chlamydia control activities, NAATs for chlamydia diagnosis and surveillance of diagnosed cases. The focus on basic activities of primary STI prevention and chlamydia case management may reflect the limited empirical evidence for the effectiveness of population level chlamydia screening programmes.

Recommendations

- The use of levels A to D is preferred as a system for classifying chlamydia prevention and control activities in EU/EEA Member States in the future. The definitions and content of activities for each level could still be clarified further for use in future surveys and reports. The ongoing evaluation of the ECDC guidance document on chlamydia control in Europe provides an opportunity to review the definitions and harmonise with indicators used in the present analysis.
- ECDC Guidance level B can be considered as the standard for minimum levels of chlamydia prevention and control in EU/EEA Member States. In the 2012 survey, level B corresponds to category 3 and includes:
 - a national strategy or plan for STI prevention and control activities
 - primary STI prevention activities
 - chlamydia case management guidelines that address diagnosis, testing, treatment, partner notification and reporting of cases
 - surveillance of diagnosed chlamydia cases.
- Existing chlamydia case management guidelines, such as the International Union against STI European guidelines or existing comprehensive guidelines from other countries may be a useful resource for developing guidelines for local use.
- Clinical audits of practice against agreed standards are a useful method for assessing the implementation of chlamydia case management guidelines. Quality improvement interventions might help to improve adherence to guidelines.
- ECDC will continue to provide technical support to Member States where requested to help them achieve desired levels of chlamydia prevention and control.

Introduction

Background

Chlamydia infection in Europe

Chlamydia trachomatis (chlamydia) causes the most commonly reported bacterial sexually transmitted infection (STI) in Europe [1,2], which affects mostly young heterosexual adults. High levels of reported infections in several European Union and European Economic Area (EU/EEA) countries and the knowledge that chlamydia infection can lead to complications have made control of the disease a priority. A summary of findings from a systematic review of surveys of random samples of the general populations suggests that the prevalence of chlamydia infection in sexually experienced men and women ≤ 25 years ranges from about 3–6% [3]. Estimates from five nationally representative studies of sexually experienced young adults ranged from 3.0% (95% CI 1.7–5.0%) in the UK [4] to 5.3% (95% CI 2.3–10.2%) in Croatia [5] in women and 2.4% (95% CI 1.0–5.7%) in France [6] to 7.3% (95% CI 3.4–13.4%) in Croatia in men [5]. But, as yet, few European countries have been able to conduct nationally representative surveys of chlamydia prevalence.

Surveillance systems also provide data about chlamydia infection. More countries collect surveillance data than have conducted population-based surveys, but surveillance data are limited to infections that have been diagnosed and reported. The European surveillance system (TESSy) provides the data published each year by the European Centre for Disease Prevention and Control (ECDC) on the rate of diagnosed and reported chlamydia infections in EU/EEA Member States based on individual countries reporting [2]. These data show that the number of cases of chlamydia reported per 100 000 population varies widely between countries. In 2011, Iceland had the highest rate of reported infections (657 per 100 000) followed by Denmark (479 per 100 000) and Norway (458 per 100 000). Rates below 10/100 000 were reported by Bulgaria, Cyprus, Greece, Luxembourg, Poland, Romania and Slovakia. Level of testing is the main factor associated with geographic variation in the rate of reported chlamydia infections but completeness of case reporting will also affect the observed data [7,8]. Rates of diagnosed infections have increased over time in many countries because of more widespread testing and more sensitive diagnostics, particularly nucleic acid amplification tests (NAATs), which can be used on urine specimens and self-taken vaginal swabs.

Clinical manifestations, diagnosis and treatment

Chlamydia infections caused by *C. trachomatis* serotypes D to K primarily infect the urethra in men and the cervix in women. Chlamydia infections in both women and men are usually asymptomatic; when they cause symptoms, genital discharge is the main manifestation. On average, untreated chlamydia infections last more than a year and can cause a range of complications [3]. These include: ascending infection in the genital tract (pelvic inflammatory disease, PID, in women and epididymo-orchitis in men) followed by scarring and fibrosis, which predispose to ectopic pregnancy, tubal infertility and chronic pelvic pain; transmission during pregnancy (associated with prematurity) and labour (resulting in neonatal lung and eye infections); and an increase in the likelihood of transmission and acquisition of HIV infection [9,10]. It is hard to measure the incidence of complications that is attributable to chlamydia infection [3] for the following reasons: clinical diagnosis of upper genital tract infection is both insensitive and non-specific [11]; contraception can delay the diagnosis of chlamydia-caused ectopic pregnancy and infertility for many years after infection; and, the same complications can also arise from other infections.

Nucleic acid amplification tests (NAATs) are the most reliable diagnostic tests for detecting *C. trachomatis*, as they have high sensitivity and specificity [12–14]; they perform well on easily collected non-invasive specimens (e.g. urine and self-collected vulval or vaginal swabs) and are simple to transport. But they are more expensive than other diagnostic methods, require expensive equipment and personnel with advanced training, and their positive predictive value is low in low prevalence settings [15].

Chlamydia infection can be treated successfully with antibiotics. Doxycycline and azithromycin cure $\geq 90\%$ of chlamydia infections (based on assessment a few weeks after treatment) [16]. But antibiotic treatment provides only limited immunity [14], and about 20–30% of women have repeated positive tests for chlamydia in the year after treatment [17–19].

Prevention and control of chlamydia infection

Chlamydia trachomatis presents several challenges for the prevention and control of infection, including the high level of asymptomatic infections and long duration of untreated infections, which facilitates continued transmission [20,21], the lack of long-lasting immunity after treatment and the frequency of repeated infections, which replenish the pool of asymptomatic infection [22,23]. Negative social and cultural attitudes towards people with STIs result in stigma and shame [24], both of which make treating sexual partners difficult. These negative attitudes can also make it hard to prioritise the provision of clinical services and to carry out primary prevention activities.

The principles of infectious disease control include early diagnosis, effective treatment and follow up of infected people and tracing and treatment of contacts [25]. Diagnosis and treatment of STIs are secondary prevention interventions: they cure an individual who is already infected and prevent immediate spread of the disease to sexual partners. Partner notification, also a form of secondary prevention, ensures that sexual partners are treated, and prevents re-infection of the index case [26]. Partner notification is an efficient method of identifying new cases (case finding), as is opportunistic testing of groups of individuals whose behaviours increase the risk of STIs. Primary prevention of STIs is also important. Primary prevention interventions include sexual health education in schools, media campaigns to promote safer sexual behaviour and distribution of condoms [12]. As yet, there is no vaccine for primary prevention of chlamydia infection [27].

Screening for asymptomatic chlamydia, including groups who do not necessarily perceive themselves as being at risk, is a widely recommended population-level intervention intended to control infection [28,29]. Chlamydia testing rates in young heterosexual men and women can be increased by offering opportunistic testing during healthcare consultations or outreach activities, or by systematic invitations to all people in a defined age group [30].

Mathematical modelling studies suggest that continued screening for chlamydia should reduce prevalence by reducing the average duration of infection [31-33]. Reduced exposure to infection will lower the incidence of complications such as PID. Screening can also prevent PID by detecting the infection before it ascends to the upper genital tract and treating it with antibiotics [34]. Four randomised controlled trials (RCTs) provide some evidence that offering chlamydia screening and treatment to asymptomatic women can reduce their risk of PID by about a third in the year after they are tested [3,35]. These trials however did not examine the longer-term effects of a regular screening programme. There is no evidence yet from RCTs to show that chlamydia screening reduces prevalence at the population level. One RCT that offered yearly chlamydia screening to young women and men in the Netherlands found the intervention did not reduce the proportion of positive chlamydia tests after three years, but their levels of chlamydia screening uptake were low (<20%) [36]. Observational data suggest that it is difficult to show an impact of opportunistic testing on chlamydia prevalence. In the UK, the National Chlamydia Screening Programme in England has offered chlamydia testing to sexually active women and men <25 years since 2003, with national coverage achieved in 2008 [29]. Population-based estimates of chlamydia prevalence from the British National Surveys of Sexual Attitudes and Lifestyles have not shown a change between 1999–2000, before the roll-out of the programme (3.1%, 95% CI 1.8–5.2% in women and 2.9%, 95% CI 1.3–6.3% in men aged 18-24 years) and 2010–12 (3.2%, 95% CI 2.2–4.6% in women and 2.6%, 95% CI 1.7–4.0% in men) [37]. However, comparisons between these surveys should be made with caution due to differences in methodology used in each survey.

Chlamydia control in Europe survey 2007

ECDC first assessed the state of chlamydia control activities in Europe in 2007 in the Screening for Chlamydia in Europe (SCREEn) project. Its findings are described in a technical report and related publication [38,39].

Twenty-nine European countries, including 27 EU/EEA Member States, Turkey and Switzerland, took part in the SCREEn project. Three Member States; Cyprus, Poland and Slovakia, and Croatia, an accession state, were invited but did not take part. The survey team defined five categories of chlamydia control activities (Table 1), informed by the data available in the questionnaire and the principles of infection control as applied to STI (early diagnosis and treatment, partner management and surveillance) [25] and assigned each Member State to one category. The categories reflect the increasing level of organisation that health systems and health services need to deliver the activities. The categories do not imply that there is a hierarchy of activities that should be carried out, because increasing the intensity of opportunistic testing and screening programmes has not been proven to reduce chlamydia prevalence at the population level [30]. The category assigned means that the Member State has the activities listed as well as those in lower categories.

Table 1. Categories of chlamydia control activities, situation in 27 EU/EEA Member States in 2007

Category (abbreviation)	Criteria	Situation in 2007 N=27 (%)*
1. No organised chlamydia control activity	No national guidelines for chlamydia diagnosis and treatment	11 (41%)
2. Case management for diagnosed chlamydia cases (case management)	Guidelines on chlamydia diagnosis and treatment for at least one group of healthcare professionals	5 (19%)
3. Case finding for partners of diagnosed chlamydia cases (case management, including partner notification)	Case management guidelines plus partner notification	3 (11%)
4. Opportunistic testing for selected asymptomatic individuals (opportunistic testing)	Case finding plus chlamydia testing offered to at least one specified group of asymptomatic people	6 (22%)
5. Organised screening programme (screening programme)	Organised chlamydia screening available to a substantial part of the population within the public health system (either opportunistic or systematic) with defined organisational characteristics [40]	2 (7%)

* SCREEn project [38,39], ECDC guidance document 2009 [12];

Amongst all 29 European countries in the 2007 survey, 16 (55%) had guidelines in place to manage cases of genital chlamydia (category 2 or higher). Three countries (10%) were developing guidelines for case management. Seventeen countries reported a total of 32 guidelines. Of these, 26 guidelines in 11 countries included recommendations about partner notification (category 3 or higher). NAATs to diagnose chlamydia were available in all countries except for Bulgaria, but NAATs were not always the most common test. In 2007, 21/29 participating countries did not conduct activities to detect chlamydia in asymptomatic people. Opportunistic testing was available in six of the remaining eight countries (category 4). Two countries in Europe reported an organised chlamydia screening programme (category 5).

Findings from the SCREEn project showed that countries that had active chlamydia control policies and strategies to encourage widespread chlamydia testing together with strong surveillance systems tend to have the highest reported rates of chlamydia cases [1,38,39]. High rates of diagnosed infections reflect the intensity of activities that diagnose asymptomatic infections and do not necessarily mean that the prevalence of infection in the population is high. The surveillance of complications of chlamydia infections is not standardised. A cross-country ecological study that included four European countries found no consistent association between the rate of diagnosed chlamydia cases and the incidence of female reproductive tract chlamydia complications [41].

ECDC guidance for chlamydia prevention and control

The 2007 SCREEn project provided information that ECDC used to develop a guidance document, 'Chlamydia control in Europe' in 2009 [12]. This document provides a framework to guide EU Member States in the development of their national plans for chlamydia prevention and control [12,38]. The authors of the guidance document simplified the five categories of chlamydia control activities and added primary prevention activities. The result was a step-by-step strategy for developing chlamydia control activities in four levels:

- primary prevention
- case management
- opportunistic testing
- screening programme [12].

For each level, the document lists evidence-based activities, written documents to support the activities and evaluation methods. Primary prevention (level A) and case management, including partner notification (level B) are essential activities that should be introduced first. Given the limited empirical evidence of effectiveness at the population level, opportunistic testing (level C) and screening programmes (level D) are suggested only after basic infrastructure is in place and only when carefully monitored. ECDC distributed the guidance document to all STI contact points in all Member States and made it publicly available on its website.

Aims of the 2012 survey on chlamydia prevention and control in Europe

A second survey of EU/EEA Member States' chlamydia control activities provides the opportunity to build on earlier findings and ongoing work and to examine changes over time. The aims of the 2012 survey are: 1) to describe chlamydia prevention and control activities in EU/EEA Member States in 2012 and compare changes between 2007 and 2012; 2) to collect information about new relevant topics to help evaluate the 2009 guidance document; 3) to identify unpublished data about the population prevalence of chlamydia; and, 4) to recommend activities that could strengthen chlamydia prevention and control in Europe.

Survey methods

A protocol describing the methods for conducting and analysis of the 2012 survey was agreed between the survey team and ECDC, following the procedures summarised below.

Study design

The design was a cross-sectional survey to collect national level data. The questionnaire was developed in English; following the structure of the 2007 questionnaire and retaining questions that allowed some comparison between the two surveys. Some new questions were added to take into account recommendations and suggestions from invited experts. STI experts from three Member States piloted the survey tool before the questionnaire was considered to be finalised.

The final 2012 questionnaire, like the 2007 version, had six sections (Appendix Table 1). It included 63 questions (Appendix Table 2), including new questions about primary prevention policies and activities. Information to assess the implementation and the impact of the 2009 ECDC guidance document on chlamydia control [12] was also requested, as was information about studies of chlamydia prevalence to supplement the literature review on chlamydia epidemiology in Europe [3].

Respondents from Member States were invited to assess the level of activities themselves, based on the levels defined in the ECDC guidance document (Table 2). To allow a comparison between survey responses in 2007 and 2012, the survey team aligned the categories used in 2007 and the levels defined in 2009 and developed a way to name the categories (Table 2). Based on expert advice received in a preparatory meeting for the survey (September 2012) ECDC suggested category 3, level B in the guidance, as the standard for minimum essential activities for chlamydia control activities, requiring clinical guidelines for chlamydia case management, including partner notification.

Table 2. Correspondence between categories defined in SCREEn project survey 2007 and levels defined in ECDC guidance document 2009

2007 SCREEn project categories*	2009 ECDC guidance document†	Criteria, operationalised for use by Member States in 2012
1*		No organised chlamydia control activities
Primary prevention not assessed	A	We have activities for primary prevention of sexually transmitted infections in general, including some or all of the following: health promotion, health education, and sex and relationship education in schools, condom promotion and distribution.
2/3‡	B‡	We have nationally recommended guidelines for managing people with diagnosed chlamydia; the guidelines include some or all of the following: diagnostic methods, antibiotic treatment, partner management, case reporting. We have primary prevention activities as well.
4	C	We have guidelines for offering opportunistic screening to specific groups of asymptomatic people at risk of chlamydia when they attend healthcare or outreach settings. People found to be infected are managed according to guidelines for treatment and partner notification services. We have primary prevention activities as well.
5	D	We have an organised programme that offers regular chlamydia screening to asymptomatic individuals in a well-defined target population. People found to be infected are managed according to guidelines for treatment and partner notification services. We have primary prevention activities as well.

SCREEn, Screening for Chlamydia Review in Europe project;

* Categories 1-5 are defined in Table 1 [38,39]. The SCREEn project survey did not ask about primary prevention so category 1 and category A do not correspond;

† Categories A to D are the levels in the step-by-step approach of the ECDC guidance document [12];

‡ The question assessing case management guidelines and their content included partner management as one item, but it was not compulsory. This category therefore covers both categories 2 and 3, and does not completely correspond with ECDC level B;

Recommendations about essential activities, policies and evaluation points from the 2009 ECDC guidance document [12] were used to develop a set of 13 'key indicators' that allowed comparison across EU/EEA Member States (Table 3).

Table 3. Topic headings and key indicators for chlamydia control activities

Topic headings		Activity level in ECDC guidance
Indicator No.*	Description	
Chlamydia strategies and plans		
1	The Member State has published a specific strategy or plan on the control of STI, either as a standalone document or as part of an HIV/AIDS/STI control strategy or plan.	A
Primary prevention		
2	A strategy or plan addresses sexual health promotion, including the primary prevention of chlamydia.	A
3	The Member State has organised activities to improve knowledge, behaviour and awareness of chlamydia prevention, diagnosis and treatment in a) the whole population or b) specific population groups.	A
Case management guidelines		
4	A Member State or professional organisation in the Member State endorses a clinical guideline for chlamydia case management for one or more medical professional groups (including diagnosis and treatment).	A/B
5	Case management guidelines explicitly address: a) case finding through partner notification; b) advice or counselling about prevention of future infection.	B
Opportunistic testing and screening programmes		
6	Asymptomatic people from: a) specific high-risk groups; or b) larger groups in the population are offered chlamydia testing opportunistically.	C
7	A national or regional programme that offers screening to a substantial part of the population at risk is in place.	D
Activities not explicitly stated in levels A to D		
Organisation of STI services		
8	Healthcare services that diagnose and treat people with STI symptoms are accessible within the general health system or in specialised STI clinics.	
Laboratory diagnosis		
9	Laboratories use reliable diagnostic tests for chlamydia.	
10	Laboratories take part in a recognised quality control programme.	
Surveillance		
11	Surveillance of chlamydia cases is in place and trends in specific groups are analysed.	
12	Surveillance of chlamydia testing is done and high and lower risk groups are covered.	
13	Data about occurrence of potential complications from chlamydia, such as PID, ectopic pregnancy and infertility are monitored.	

PID, pelvic inflammatory disease; STI, sexually transmitted infection

* Survey questions relating to each key indicator are shown in Appendix Table 2.

Secondary data

Background data from secondary sources were collated. These data were used to help put Member States' questionnaire responses into the context of demographic and economic conditions (national population size, per capita Gross Domestic Product (GDP) [42].

ECDC surveillance data for 2011 were used to help examine the distribution of surveillance systems according to category of chlamydia control activities [2].

Survey implementation and analysis

Questionnaire roll-out

The questionnaire was converted, using a SharePoint survey tool, for electronic distribution via the ECDC website (SharePoint, Microsoft, USA). When questions were identical to those asked in the 2007 survey, the answers were pre-filled in order to reduce the workload of the country contact point from the ECDC STI network. The STI contact points were asked to change the responses when necessary, and to ask other experts for help if they were uncertain of the answers themselves. Representatives were also asked to send background information, such as strategy documents and guidelines. A member of the survey team (IvdB) monitored answers, responded to questions and sent reminders. The survey team launched the questionnaire in the first week of December 2012.

The deadline for completion was the end of January 2013, but questionnaires were accepted up to the end of February 2013.

Participating countries

ECDC invited the country contact points from the STI networks of all 27 EU Member States as of September 2012 and three EEA Member States (Iceland, Liechtenstein and Norway) to participate (Table 4). Croatia acceded to EU membership in July 2013 and was not invited to take part.

Table 4. Countries invited to take part in the survey of chlamydia prevention and control in 2012

Status	Number N=30	Countries
EU Member State before May 2004	15	Austria, Belgium, Denmark, Finland, France, Germany, Greece , Ireland, Italy, Luxembourg*, The Netherlands, Portugal, Spain, Sweden, United Kingdom;
EU Member State since May 2004	10	<i>Cyprus, Czech Republic</i> , Estonia, Hungary, Latvia, Lithuania, Malta, Poland , <i>Slovakia</i> , Slovenia;
EU Member State since January 2007	2	Bulgaria, Romania
European Economic Area	3	Iceland, Liechtenstein, Norway.

EU, European Union;

*Member States shown in italics had no data available in 2007; Member States shown **in bold** did not respond in 2012.*

** Luxembourg was included among responders (see 2.1)*

The UK questionnaire covered the situation in England; but separate information on the situation in other parts of the UK (Wales, Scotland, Northern Ireland) was received and this was commented on in the report when relevant.

Data management and analysis

Microsoft Excel 2010 (Microsoft, Redmond, USA) was used to manage data. Data for each country were collated and then merged with responses from the 2007 SCREEn questionnaire and secondary data. Variables were renamed and recoded as necessary before importing the data into IBM SPSS Statistics (version 19.0, IBM Software, New York, USA) for statistical analysis.

Responses to questions that related to each key indicator were first described using numbers and percentages. Responses to questions that were asked in both 2007 and 2012 were then compared. A limited number of statistical hypothesis tests were carried out as the number of countries in the survey was small. Free text comments from selected countries are highlighted to illustrate key points that the survey team found relevant.

Categorisation of chlamydia control activities

Based on answers to the questionnaire, the survey team used the same methodology, definitions (Glossary) and criteria as in 2007 (Table 1) [38], to assign each country to a category. Two assessors used pre-defined criteria independently to review country-specific responses, and assigned the country to one of five mutually exclusive categories of chlamydia control activity. In case of discrepancies, a third reviewer rated the countries and the assessors reached consensus by discussion. The survey team compared the percentage of Member States with chlamydia control activities in category 3 in 2007 and 2012.

Responses to questions about key indicators and respondents' self-assessments of chlamydia prevention and control activities on levels A to D were then examined. The survey team asked for clarification when responses seemed inconsistent and report their interpretation of these enquiries in the results. The self-assessment was then compared with the category assigned by the researchers.

Results

The findings of the survey are presented under the seven topic headings listed in Table 3. For each topic, responses to questions relevant to each key indicator and other associated questions are described. Where relevant, survey responses in 2007 and 2012 are compared. The level of chlamydia control activities as described by the contact point, and the categories the survey team assigned are then reported. The wording used in the questionnaire is used to report results for each question or topic area. For some topics areas, respondents seem to have interpreted some terms differently, although the survey team provided definitions in the questionnaire (Glossary). These issues are described at the start of the relevant sections of the results.

Response rate

Complete responses to the questionnaire were received from 27 of the 30 invited Member States (90%). The STI contact point in Luxembourg reported that chlamydia screening and control were unchanged, and that only four cases of chlamydia were reported in 2012. When Luxembourg's responses in 2007 were carried over to 2012, the response rate was 93% (28/30). Greece and Poland did not participate (in Greece the HIV/STI country representative was unavailable due to an ongoing HIV-epidemic among people who inject drugs).

In 2007, 29/33 countries took part (88%), including two non-EU/EEA countries, Switzerland and Turkey. Three EU Member States, Cyprus, Poland, and Slovakia and Croatia (then an accession country), were invited but did not participate.

There were 25 countries that participated in both 2007 and 2012 and their responses could be directly compared. These included the 30 invited countries for the 2012 survey (Table 3) less two non-respondents (Greece and Poland), two countries which did not take part in 2007 (Cyprus and Slovakia) and the Czech Republic (data were missing from the 2007 survey database and a paper copy of the questionnaire could not be found).

Key indicators

Strategies and plans for STI control

Key indicator 1. The Member State has published a specific strategy or plan on the control of STI, either as a standalone document or as part of an HIV/AIDS/STI control strategy or plan

Respondents provided a range of documents including strategies, plans and policies, although the questionnaire asks only about strategies and plans. This section refers only to strategies and plans, as in the questionnaire. Appendix Table 3 shows all the documents provided.

Of 28 participating countries in 2012, 11 (39%) had a strategy or plan for STI control. Six of those 11 reported that chlamydia control was specifically mentioned in the document (Table 5 and Appendix Table 3 for links to documents provided by survey respondents).

Amongst countries taking part in both surveys, two more countries in 2012 (10/25, 40%) had a strategy or plan than in 2007 (8/25, 31%); of these, five specifically mentioned chlamydia (Figure 1).

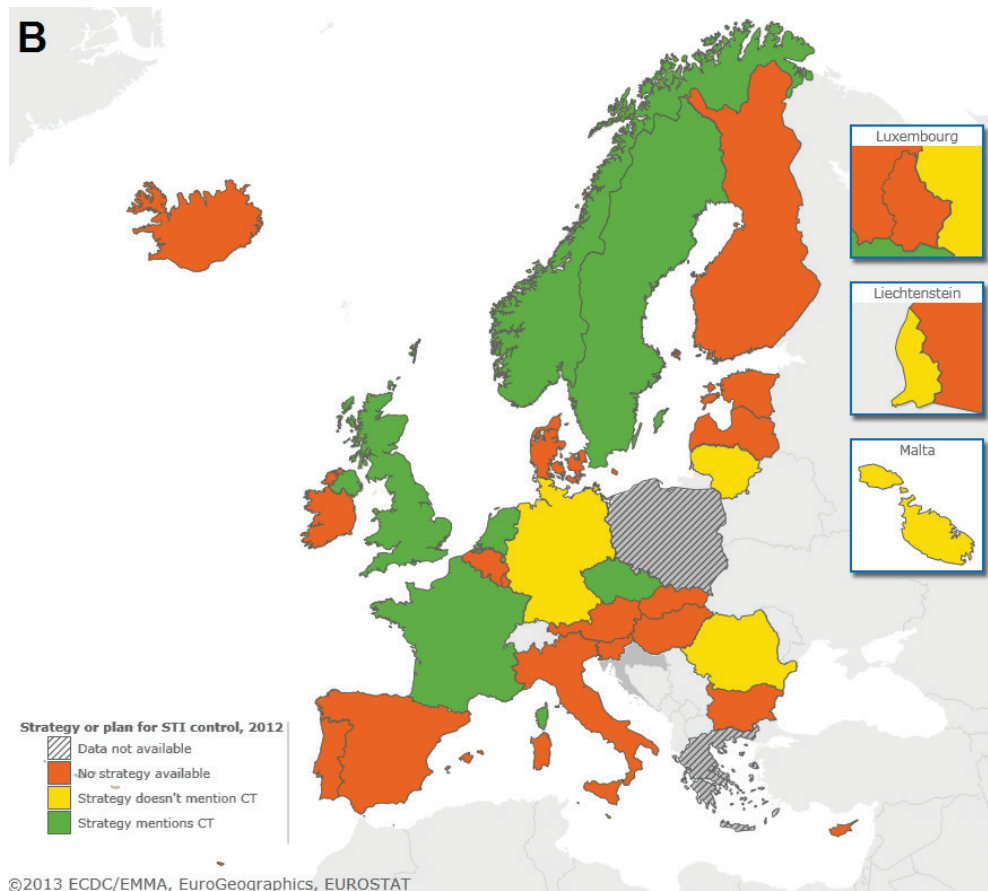
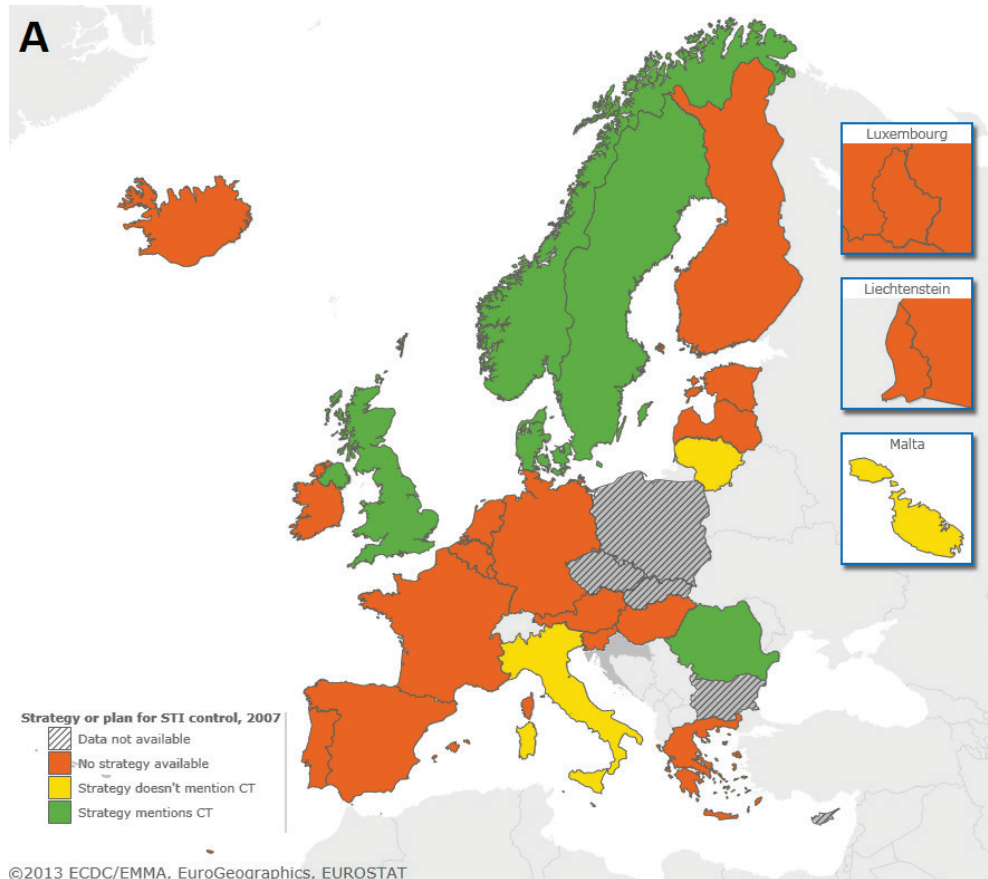
France and the Netherlands did not have a national strategy about STI control in 2007, but reported a strategy or plan on STI control that specifically mentions chlamydia in 2012. Germany and Liechtenstein did not have a strategy or plan in 2007, but had developed one by 2012, though it does not mention chlamydia specifically. Romania reported a chlamydia-specific strategy in 2007 but reported only a general strategy on STI control in 2012. In 2012 Italy no longer reported an STI strategy. Denmark had a specific strategy in 2007, but no longer reported one in 2012 because the strategy document on sexual health /STI prevention was rewritten with a more general focus on sexual health, and dropped the specific reference to chlamydia. Sweden, Norway and the UK had a specific chlamydia strategy or plan for STI control in both 2007 and 2012.

Table 5. Availability of a national strategy or plan on STI control

National strategy or plan on STI control	Countries 2012 (N=28)	Countries 2007 (N=27)
Strategy specifically mentions chlamydia	Czech Republic, France, Netherlands, Norway, Sweden, UK (England)* (n=6)	Denmark, Norway, Romania, Sweden, UK (n=5)
Strategy does not mention chlamydia	Germany, Liechtenstein, Lithuania, Malta, Romania (n=5)	Italy, Lithuania, Malta (n=3)
No strategy	Austria, Belgium, Bulgaria, Cyprus, Denmark, Estonia, Finland, Hungary, Iceland, Ireland, Italy, Latvia, Luxembourg, Portugal, Slovakia, Slovenia, Spain (n=17)	Austria, Belgium, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Latvia, Liechtenstein, Luxembourg, Netherlands, Portugal, Slovenia, Spain (n=17)
No response or data missing	None	Bulgaria, Czech Republic (n=2)
Non-participating countries	Greece, Poland	Cyprus, Poland, Slovakia

* Northern Ireland and Scotland have a strategy, but do not specifically mention chlamydia. Wales reported a strategy that briefly mentions chlamydia.

Figure 1. EU/EEA countries with a strategy or plan about STI control (A) in 2007 and (B) 2012



CT, chlamydia. UK situation based on England

Primary prevention

Key indicator 2. A strategy or plan addresses sexual health promotion, including the primary prevention of chlamydia

Data on prevention were collected for the first time in the survey in 2012 from 27 Member States (Luxembourg did not respond to this question). A strategy or plan for primary prevention was available in 16 of 27 countries (59%). In nine countries (33%) this strategy or plan specifically mentioned chlamydia (Table 6). Sweden issued a national action plan (2009–2014) for chlamydia that covered many aspects of prevention, but focused on primary prevention.

Table 6. Health promotion policies or educational programmes for primary prevention

Health promotion policies or educational programmes for primary prevention of chlamydia	Countries 2012 (N=28)
Strategy or plan mentions chlamydia	Belgium, Czech Republic, Denmark, Finland, France, Netherlands, Norway, Sweden, UK (n=9)
Strategy or plan does not mention chlamydia	Bulgaria, Cyprus,* Liechtenstein, Lithuania, Malta, Romania, Slovakia (n=7)
No strategy or plan	Austria, Estonia, Germany, Hungary, Iceland, Ireland,† Italy, Latvia, Portugal, Slovenia, Spain (n=11)
Missing data	Luxembourg (n=1)
Non-participating countries, or data not available	Greece, Poland

* A strategic plan has been written in Cyprus and awaits approval;

† Ireland is developing a national sexual health strategy. Northern Ireland and Scotland have a general strategy or plan to prevent STIs. Wales reported a strategy that mentions chlamydia briefly.

In 13 of the 16 countries (81%) that have a strategy or plan on primary prevention, access to reliable information on chlamydia and STI is provided as a public right. The strategy or plan of 15 of 16 countries (94%) addresses prevention of risk behaviour and use of condoms. Eleven of 16 country policies (69%) address the facilitation of access to sexual health and STI care services. The importance of (regular) testing for chlamydia and STI is addressed in the policies of 9 of 16 countries (56%; 7 of these 9 countries have guidelines and/or implement opportunistic screening).

Key indicator 3. The Member State has organised activities to improve knowledge, behaviour and awareness of chlamydia prevention, diagnosis and treatment in a) the whole population or b) specific population groups

Twenty-two of 27 countries (81%) reported organised activities for prevention. Several activities are intended to improve knowledge, behaviour and awareness about chlamydia prevention and have been implemented in the last five years:

- awareness campaigns are routinely publicised via public media in six of 27 countries (22%) and are a singular, specific public media programme in 10 of 27 countries (37%)
- campaigns using social media (internet, short message service (SMS, text message), Twitter, etc.) were reported in 13 of 27 countries (48%)
- local or regional chlamydia/STI prevention campaigns were reported in 13 of 27 countries (48%)
- education about sexual health and STI prevention is a standard/obligatory part of the general school curriculum in 11 countries (41%), is sometimes combined with other voluntary elements (in five countries; 19%), or a voluntary part of the existing curriculum (in seven countries; 26%)
- almost half the surveyed countries promote condom use among the young heterosexual population (13 of 27).

Belgium, Cyprus and Denmark (11%) are the only countries that include specific information about chlamydia in all their activities to prevent STI. Fifteen countries (56%) include specific information about chlamydia in some of their primary prevention activities. Seven countries (26%) do not specifically address chlamydia in their primary prevention activities.

Sexual health education and STI/chlamydia prevention activities target the whole population in 11 countries (41%). More often, one or more specific population groups are targeted:

- sixteen countries (59%) target either the primary school population (4/27, 15%), the secondary school population (15/27, 56%) and/or the school population of vocational schools (12/27, 44%)
- sixteen countries (59%) specifically address young people (<25 years old)
- ten countries (37%) specifically address men who have sex with men
- four countries (15%) address specific ethnic groups
- only the Netherlands targets commercial sex workers for prevention activities.

Country specific information on primary prevention is provided in Appendix Table 4.

Case management guidelines

Key indicator 4. A Member State or professional organisation in the Member State endorses a clinical guideline for chlamydia case management for one or more medical professional groups (including diagnosis and treatment)

In 2012, 22 of 28 (79%) Member States had clinical guidelines for chlamydia case management. Ireland, Luxembourg, Malta, Portugal, Slovenia and Slovakia (6/28, 21%) had no guidelines. Respondents in the 22 Member States reported a total of 68 different guidelines (documents or links provided with the questionnaire are given in Appendix Table 3).

In 19 of 22 countries (86%), guidelines were directed at all healthcare practitioners who work with STI patients (Appendix Table 5). Of these countries, 15 (68%) updated their guidelines or wrote new ones between 2007 and 2012. In seven countries, the Ministry of Health recommended these guidelines be implemented, and in another six the recommendation was made by a professional body. In the remaining six countries, it was up to the practitioner to implement guidelines. In most of these countries, the guidelines for practitioners cover the question of who to test (16), which test to administer (18), which treatment (16) to use, partner management (16) and follow-up (17). Some of the guidelines also include information on how to report cases (8) and counselling regimens (7).

All countries with general guidelines for all practitioners (except Estonia) had also developed guidelines for specialists. Twenty of 28 countries (71%) had case management guidelines available for multiple professions (Table 7 and Appendix Table 5):

- thirteen of 28 countries (46%) had guidelines for general practice or primary care physicians. These were new or updated in eleven countries (36%)
- fourteen countries (50%) had guidelines for dermatovenereology or genitourinary medicine (GUM) specialists. These were new or updated in eight countries (27%)
- fourteen countries (50%) had guidelines for gynaecology or antenatal clinics. These were new or updated in nine countries (32%)
- eight countries (29%) had guidelines for another type of specialist (for example, for infectious medicine practitioners in Czech Republic). These were new or updated in six countries (24%).

Table 7. Numbers of Member States with guidelines in 2007 and 2012 and guideline audience

Guideline audience	Available 2012, new or updated *	Available 2012, not updated*	Available 2007*
All health care practitioners	Austria, Belgium, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Italy, Liechtenstein, Norway, Romania, Spain, Sweden, UK† (n=15)	Cyprus, Hungary, Iceland, Lithuania (n=4)	Belgium, Estonia, Greece, Hungary, Iceland, Lithuania, Norway, Romania, Sweden (n=9)
General practice or primary care physicians	Austria, Bulgaria, Czech Republic, Finland, Iceland, Liechtenstein, Norway, Spain, Sweden, UK (n=10)	Cyprus, Denmark, Netherlands (n=3)	Denmark, Netherlands (n=2)
Dermato-venereology or GUM specialists	Austria, Bulgaria, Finland, Liechtenstein, Netherlands, Norway, Romania, Sweden (n=8)	Cyprus, Czech Republic, France, Italy, Latvia, UK (n=6)	Austria, France, Italy, Latvia, Netherlands, UK (n=6)
Gynaecology or antenatal clinics	Austria, Bulgaria, Finland, Italy, Iceland, Liechtenstein, Netherlands, Norway, Sweden (n=9)	Belgium, Cyprus, Czech Republic, Germany, Latvia (n=5)	Belgium, Germany, Latvia, Netherlands (n=4)
Other	Bulgaria, Czech Republic, Liechtenstein, Netherlands, Sweden, UK‡ (n=6)	Cyprus, Germany, (n=2)	Germany, Netherlands, UK† (n=3)
Missing data	None	None	Czech Republic (n=1)
No guidelines	Ireland, Luxembourg, Malta, Portugal, Slovenia, Slovakia (n=6)		Bulgaria, Finland, Greece, Ireland, Liechtenstein, Luxembourg, Malta, Portugal, Slovenia, Spain (n=10)
Non-participating countries or data not available	Greece, Poland		Cyprus, Poland, Slovakia

* In 2012, 22 countries in total had at least one guideline; 17 countries had one or more guidelines that were new or updated; 13 countries had guidelines that were the same as in 2007. In 2007, 17 countries in total had one or more guidelines. Within each column, each country can have more than one guideline audience. Countries without guidelines not listed;

† In the UK, only in Scotland there is a guideline for the management of chlamydia infection for all healthcare practitioners, which was updated in 2009.

‡ UK guideline under 'Other' is from the National Chlamydia Screening Programme (in England only).

When the 25 countries with available data in both surveys were compared, we found that the number of countries with guidelines in 2007 (16/25, 64%) had increased by 2012 (20/25, 80%). In 2007, Bulgaria and Finland had guideline(s) in preparation; Liechtenstein and Spain had no guidelines. All four countries had implemented new

guidelines by 2012. The total number of available guidelines increased considerably: there were 25 sets of guidelines in 2007 (16/25 countries) and 62 in 2012 (20/25 countries). The number of countries with guidelines per professional group also increased:

- in 2007, guidelines for all healthcare practitioners were available in eight of 25 countries (32%); in 2012, 17 guidelines were available in the same 25 countries (64%)
- in 2007, guidelines for general practice were available in three countries (12%); in 2012, 12 guidelines were available for general practice in 25 countries (44%)
- in 2007, guidelines for dermatovenereology or genitourinary medicine (GM) specialties were available in six of 25 countries (24%); in 2012, guidelines were available for these specialties in 13 countries (52)
- in 2007, guidelines for gynaecology or antenatal clinics were available in four of 25 countries (12%). In 2012, guidelines were available for these specialties in 14 countries (56%)
- in 2007, other guidelines were available in four countries (15%), in 2012, other guidelines were available in 6 countries (24%).

Belgium reported that it had case management guidelines for general practitioners in 2007, as well as another specific treatment guideline, but these were not mentioned in 2012.

Key indicator 5. Case management guidelines explicitly address: a) case finding through partner notification; b) advice or counselling about prevention of future infection

The wording of questions about partner notification in 2012 differed to those in the 2007 survey. This section also reports responses to the 2012 questions about repeat testing for chlamydia.

Case finding through partner notification

The questionnaire asked whether partner notification is 'mandatory' or 'recommended.' The survey team used the term 'mandatory' partner notification to mean that a law, decree or regulation requires medical staff to do partner notification or patients to accept partner notification. Not all respondents seem to have applied a legal definition. The Member States reporting mandatory partner notification for chlamydia in this survey (Table 8) differ slightly from those in an ECDC technical report about partner notification for STIs based on data collected in 2008/2009 [26].

In 2012, partner notification was addressed in 19/28 countries (68%) by at least one guideline (Table 8 and Appendix Table 6). Partner notification for chlamydia is reported to be mandatory in eight countries (29%) and recommended in 11 countries (39%). Prevention advice or counselling were addressed in at least one case management guideline in nine (32%) Member States. All of these also addressed partner notification (Table 8).

Table 8. Case management guidelines addressing partner notification and prevention advice

Guideline content	Countries 2012 (N=28)
Partner notification mandatory†	Finland, Hungary, Iceland, Latvia, Lithuania, Norway, Sweden, UK (n=8)
Partner notification recommended	Austria, Bulgaria, Czech Republic, Denmark, Estonia, France, Germany, Liechtenstein, Netherlands, Romania, Spain, (n=11)
Prevention advice or counselling*	Austria, Bulgaria, Estonia, Finland, Liechtenstein, Lithuania, Netherlands, Norway, UK (n=9)
Partner notification or prevention or counselling not addressed	Belgium, Cyprus, Italy, (n=3)
No guideline for case management	Ireland, Malta, Portugal, Slovakia, Slovenia (n=5)
Missing data	Luxembourg (n=1)
Non-participating countries or no data reported	Greece, Poland

* All countries in this row have guidelines that address partner notification;

† The questionnaire used the word 'mandatory'. In the ECDC Technical Report on the public health benefits of partner notification for sexually transmitted infections and HIV three more countries, Estonia, Malta, and Romania, reported mandatory partner notification for chlamydia at the time of the survey in 2008 [26].

In 12 countries the available case management guidelines do not specify particular procedures for partner notification. Guidelines in nine countries state that partner notification should be discussed or recommended during a consultation, after which the patient takes responsibility for notifying the partner (i.e. patient referral). In case management guidelines from seven countries, specific partner notification practices are recommended:

- guidelines in Bulgaria, Finland and Norway suggest that the patient could deliver partner therapy
- partner notification by or with help from health staff (i.e. provider referral) was reported in Finland, Hungary, Iceland, Netherlands and Norway.
- in Iceland, patients can decide whether they or the practitioner will contact the partner. The practitioner can refer partner notification to the STI clinic; notification can be done anonymously
- in Sweden, the guideline directs practitioners to follow a specific separate partner notification guideline, which recommends the partner notification approach for specific situations).

Table 9. Methods for partner notification in Member States where case management guidelines address partner notification

Methods*	Countries 2012 (N=19)†
No specific partner notification method recommended	Austria, Czech Republic, Denmark, Estonia, France, Germany, Latvia, Liechtenstein, Lithuania, (n=9)
Professional discusses partner notification, notification is by patient referral	Bulgaria, Czech Republic, Finland, France, Netherlands, Norway, Romania, Spain, UK‡ (n=9)
Patient-delivered partner therapy	Bulgaria, Finland, Norway (n=3)
Partner is notified by or with help of health personnel	Finland, Hungary, Iceland, Netherlands, Norway (n=5)
Separate partner notification guideline recommends the method for specific situations	Sweden (n=1)

PN partner notification

* Multiple answers possible;

† Countries in which case management guidelines do not address partner notification are not listed;

‡ Scotland reported that clients are offered a choice of patient or provider referral, patients diagnosed in primary setting can be referred to a genitourinary medicine clinic.

Respondents were asked to indicate strengths and weaknesses of chlamydia control activities in their country (Box 1). Most indicated that current practices for diagnosis and case management of chlamydia were adequate (n=13/26; 50%) or basic (n=11/26; 42%). Of the 14 countries that provided more details, 12 indicated that partner notification practices need to be improved.

Box 1: Strengths and weaknesses of chlamydia diagnosis, treatment and partner notification

Examples:

France

"Practice of diagnostics and case management seems to be adequate. However, partner notification remains a weak element in the management of patients with STIs. Partner notification is not an organized and systematised activity in France, but is left to the individual discretion of physicians and patients".

The Netherlands

"Partner notification for chlamydia is mostly done by the patients themselves, on advice of the health professional."

UK

"Diagnosis and case management practices are strong, when testing is carried out. Partner notification could be improved (latest data suggest a ratio of partners treated to index cases of 0.4)".

Bulgaria

"Health professionals discuss partner notification for any STI with the client, but it is the responsibility of the client to inform the partners".

Germany

"There are no partner notification guidelines. Gynaecologists are not able to provide treatment for men; male partners have to get a separate appointment which is probably seldom done".

Ireland

"Adequate practices in STI clinics, but there is no organised method of community partner notification in primary care, so partner notification is performed on an ad hoc basis".

Repeated testing

In the questionnaire section on guidelines, countries were asked whether they recommended repeated testing after an initial positive or negative test result.

Retesting after a positive result was done in several countries, for different reasons and target groups:

- to confirm the positive test (Austria, Romania)
- as a test of cure, typically 3–6 weeks after treatment (Bulgaria, Czech Republic, Estonia, Finland, Hungary and Norway); in some of these countries a test of cure is done only in specified cases, such as when poor treatment compliance is suspected (Norway, UK), when symptoms are still present (Norway, Netherlands) and when an antimicrobial other than azithromycin or doxycycline has been used for treatment (Netherlands, France);
- testing for reinfection (typically several months after treatment to identify repeated infections) is recommended in guidelines in Italy, Estonia, Germany, Norway, the Netherlands, Sweden and the UK, often only for specified groups like women at high risk of re-infection (Norway, Netherlands) or pregnant women (Norway, Italy, Netherlands) or complicated chlamydia cases (Sweden).

Retesting after a negative test result was recommended as 'repeat screening' at yearly intervals in Lithuania, and also in France for women with a new partner, and in the Netherlands for high-risk women (i.e. < 25 years, of non-Dutch ethnicity, with multiple partners in the last six months or practising unsafe sex). In the UK, guidelines for the National Chlamydia Screening Programme in England has recommended annual testing and testing on change of sexual partner, but more recently (after the survey was completed but before the current publication) this was expanded to 'routine repeat testing at around three months after treatment'.

Testing pregnant women for chlamydia

The questionnaire asked whether pregnant women were a named group of asymptomatic people who should be offered chlamydia testing as part of the recommendations for testing specific groups of asymptomatic persons in clinical guidelines.

In 10 out of 28 countries (36%), at least one guideline included a recommendation to test pregnant women for chlamydia infection. In five countries (Austria, Bulgaria, Estonia, Romania and Sweden), chlamydia testing for pregnant women was included in all existing guidelines. In most countries, the recommendations were included in the gynaecology or antenatal clinic (n=8; Austria, Bulgaria, Finland, Germany, Italy, Latvia, Norway, Sweden) and dermatovenereology/GUM clinic (n=6; Austria, Bulgaria, Finland, Romania, Norway, Sweden) guidelines.

A second question (in the section 'organisation of STI care') specifically asked if pregnant women are routinely screened for chlamydia. Four countries (Austria, Germany, Latvia and Sweden) answered that this was routine. Germany and Latvia screen pregnant women in the first trimester of pregnancy. Sweden screens first-time pregnant women, but women who become pregnant again will be tested based on their clinical history. Austria did not respond to the question on the timing of screening.

Opportunistic testing and screening programmes

Key indicator 6. Opportunistic testing is offered to asymptomatic persons from a) specific high-risk groups, or b) larger (lower-risk) groups in the population

In 18 of 28 (64%) countries, case management guidelines addressed chlamydia testing of specified groups of asymptomatic people (Table 10). Respondents chose from a list of suggested groups and added groups not otherwise listed. This information was supplemented by a separate question about access to opportunistic chlamydia testing. In three countries (11%), guideline(s) specified asymptomatic groups of people that should be tested opportunistically and reported that testing was standard practice. Twelve countries (43%) had guidelines that specified asymptomatic groups of people that should be tested, but reported that the availability of opportunistic testing was limited or was infrequent and difficult to access. Three countries (11%) specified in their guidelines groups of asymptomatic groups that should be tested, but had not implemented opportunistic testing.

Ireland has no chlamydia case management guideline, but reported that clinicians tend to follow the British Association for Sexual Health & HIV (BASHH, UK) guidelines and opportunistic testing of asymptomatic groups at high risk of infection are tested as standard practice. The situation is similar in Belgium for men who have sex with men and commercial sex workers; other groups are offered opportunistic testing less commonly. In five countries (18%), there were no available guidelines, or the available guidelines did not specify testing asymptomatic groups of people for chlamydia and opportunistic testing was limited or infrequent and difficult to access. Three countries (11%) reported no guidelines or opportunistic testing in practice, or did not provide information.

When guidelines specified testing groups of asymptomatic people for chlamydia, the most commonly reported target groups were pregnant women (ten of 28 countries; 36%) and young people (ten countries; 36%). The next most common groups were men who have sex with men (five countries, 18%), commercial sex workers (three countries, 11%) and migrants, (Netherlands only; 4%). Additional groups ranged from specific populations such as women undergoing abortion and less well-defined groups such as people with risky sexual behaviour (Table 10).

In 2007, ten countries reported opportunistic testing for selected asymptomatic individuals: in Denmark, Estonia, France, Germany, Hungary, Iceland, Latvia, Netherlands, Norway and Sweden and in the UK opportunistic chlamydia testing was offered in a screening programme in England (total 11/25 countries taking part in both surveys). In 2012, the number of countries with opportunistic testing recommendations in their guidelines was higher (17/25 countries). The supplementary information in 2012 indicated that opportunistic testing is not always implemented in practice but this could not be compared with 2007.

In both 2007 and 2012, countries recommended opportunistic testing most often for asymptomatic sexually active adolescents and young adults with multiple partners or a recent change of partner. In 2007 Estonia, Latvia and Germany recommended chlamydia testing for pregnant women. In 2012, guidelines in eight countries (in addition to Estonia, Latvia and Germany) recommended chlamydia testing for pregnant women.

Table 10. Opportunistic chlamydia testing, as recommended in guidelines and in practice

Opportunistic testing	Countries 2012* N=28	Specified groups of asymptomatic people eligible for chlamydia testing
In guidelines and done in practice (n=3)	<u>Latvia</u> <u>Sweden</u> <u>UK†</u>	Pregnant women. Young people, unprotected sex in last 12 months, MSM, pregnant women, women undergoing abortion. Sexually active women and men <25 years, after a change of partner, yearly, partners of chlamydia cases, suspected cases, chlamydia in last 12 months, 2 or more partners in last year.
In guidelines but infrequently done in practice (n=12)	<u>Bulgaria</u> <u>Denmark</u> <u>Estonia</u> <u>Finland</u> <u>France</u> <u>Germany</u> <u>Hungary</u> <u>Iceland</u> <u>Italy</u> <u>Lithuania</u> <u>Netherlands</u> <u>Norway</u>	Young people, pregnant women. Before abortion, IUD and hysterosalpingography, IVF. Pregnant women. Young people/student health care, <25 years, seeking contraceptive, pregnant women, termination of pregnancy. Sexually active women 15-30 years and annually if new partner. Pregnant women, women <25 years. Asymptomatic partners of patients with STI. Sexually active people <25 years, women >25 years with a new partner or >2 partners in last year, anyone diagnosed with another STI, partners of suspected chlamydia cases, mother of neonate with chlamydia, women seeking abortion, egg and sperm donors. Pregnant women. Sexual partners of infected patients, people with risky sexual behaviour. Young people 16-24 years, MSM, migrant population, >2 partners in last 6 months. <25 years at partner change or pregnant, before abortion, contacts of known STI patients, MSM.
In guidelines but not implemented (n=3)	<u>Austria</u> <u>Czech Republic</u> <u>Romania</u>	Pregnant women. Patients with other STI. Pregnant women, MSM, CSW.
No guidelines but done in practice (n=2)	<u>Belgium</u> <u>Ireland</u>	MSM, CSW, also heterosexuals worried after sexual contact, pregnant women (but coverage is limited for this group). STI clinic attenders, MSM, CSW.
No guidelines; limited access in practice (n=5)	<u>Liechtenstein</u> <u>Malta</u> <u>Portugal</u> <u>Slovakia</u> <u>Slovenia</u>	Groups not specified, just stated that opportunistic screening 'is available'
No guidelines, not done (n=2)	<u>Cyprus</u> <u>Spain</u>	

Opportunistic testing	Countries 2012* N=28	Specified groups of asymptomatic people eligible for chlamydia testing
Missing data	Luxembourg	
Non-participating countries or data not reported	Greece Poland	

CSW, commercial sex workers; IUD, intra-uterine device; IVF, in-vitro fertilisation; MSM, men who have sex with men; STI, sexually transmitted infection;

* Countries that reported opportunistic testing in 2007 are underlined; answers for this key indicator were not available from Luxembourg, but opportunistic testing was not done in 2007;

† Northern Ireland indicated that it does not conduct opportunistic testing for chlamydia.

Key indicator 7. An organised programme (national or regional) is in place or in preparation that offers screening to a substantial part of the population at risk

The definition of an organised screening programme differs between countries. The survey team applied the definition used in 2007 (see Glossary) to maintain comparability with responses to the 2012 surveys.

Responses to the question asking about an organised screening programme were considered with information reported in the self-assessment of chlamydia control activities. The UK reported a national screening programme (in England only) in response to both questions (Table 11). Germany described its services for chlamydia testing in women, in response to a request for clarification about its self-assessment, as an organised screening programme as defined in Germany. Since 2008, statutory health insurance companies have reimbursed gynaecologists for chlamydia tests done by NAAT on urine samples in asymptomatic pregnant women and women <25 years. The survey team interpreted the activity in Germany as opportunistic chlamydia testing. Another three countries reported plans to introduce or pilot an organised chlamydia screening programme (Table 11).

Table 11. An organised programme that offers screening to a substantial part of the population, in place or in preparation, as reported in the 2012 and 2007 questionnaires

	Countries 2012 (N=4)*	Countries 2007 (N=8)*
Organised chlamydia screening programme	UK† (n=1)	Estonia, Netherlands, UK (n=3)
Plans for organised screening programme	France, Luxembourg, Malta (n=3)	Finland, France, Germany, Luxembourg, Slovenia (n=5)

* Countries without organised screening not listed;

† Only England has an organised chlamydia screening programme. Wales and Scotland offer opportunistic testing and Northern Ireland has no opportunistic testing or screening.

In 2007, two of 25 countries (8%) responding in both surveys had an organised chlamydia screening programme in place (England, UK) or as a pilot programme (the Netherlands). In the Netherlands, a pilot programme of yearly invitations to 16–29 year old women and men in three regions of the country was evaluated in a controlled trial from 2008–2012. Uptake was low and declined over successive screening rounds [36]. The Dutch Health Council decided not to continue the programme because it had not demonstrated evidence of effectiveness and cost-effectiveness. Estonia reported a screening programme for pregnant women in 2007 but not in 2012. There were plans to introduce or pilot an organised chlamydia screening programme in five other countries (19%), including two that reported such plans in 2012. In Ireland, respondents reported that a modelling study concluded that an opportunistic chlamydia screening programme would be expensive to implement nationally and is unlikely to be judged cost-effective by policy makers [43].

Organisation of sexually transmitted infection care

Key indicator 8. Health services offering diagnosis and treatment are accessible for persons with symptoms of STI, either within the general health system or in specialised STI care facilities

Member States were considered to have services for STI care if they reported that dedicated STI services for chlamydia diagnosis and treatment were available in the country and if a clinical guideline specified groups of symptomatic persons who should be tested for chlamydia.

This section includes also information about payment for STI diagnosis and treatment and services for chlamydia testing accessible through the internet.

Public healthcare services for chlamydia diagnosis and case management

In 2012, dedicated, publicly accessible services for diagnosis and treatment of chlamydia and other STI were available in 25 of 28 countries (89%). Clinical specialties that diagnosed and treated chlamydia were dermatovenereology clinics (16/28, 57%), genitourinary medicine or STI clinics (18/28, 64%), family planning clinics (8/28, 29%), youth clinics (5/28, 18%). Other clinics (7/28, 25%) included local public health offices and general practitioners.

Dedicated public services were located in different locations in different countries. In four of 28 countries (14%), they were available across the country, including rural areas. In 14 countries (50%), dedicated public services were available in most large towns and cities. In four countries (14%) they were limited to large cities, and in two countries (7%) they were only available in the capital city. The number of dedicated public services also varied widely between countries. In countries with a small population the number was generally lower; in Iceland and Malta (<0.5 million inhabitants) there is only one clinic. In larger countries there are more, i.e. 185 in Germany (81 million) and 300 in France (65 million), but this was not always the rule, e.g. Latvia (2 million inhabitants) has 85 clinics and Norway (5 million) reported as many as 350 clinics (mainly youth clinics), while Italy (61 million) has 50.

In 15/28 countries (54%), at least one of the clinical guidelines addressed chlamydia diagnosis in symptomatic patients. In 13 of these countries (46% of 28 countries) dedicated public STI services were also available (Table 12). Most guidelines specified symptoms including urethritis, cervicitis, discharge, conjunctivitis, PID or another urogenital infection.

Table 12. Member States with both public healthcare services for chlamydia diagnosis and treatment and STI guidelines that address chlamydia diagnosis in symptomatic people

	Countries 2012 (N=28)	Countries 2007 (N=27)
Dedicated public services available but no guidelines on testing of symptomatic patients	Austria, Belgium, Cyprus, Estonia, Germany, Ireland, Italy, Latvia, Malta, Portugal, Slovenia (n=11)	Austria, Finland, Germany, Greece, Ireland, Lithuania, Malta, Netherlands, Norway, Portugal, Romania, Slovenia, Spain (n=13)
Public STI services and STI guidelines that define which symptomatic persons should be tested for chlamydia	Bulgaria, Czech Republic, Denmark, Finland, France, Hungary, Iceland, Lithuania, Netherlands, Norway, Romania, Spain, Sweden, UK (n=14)	Bulgaria, Denmark, Estonia, France, Hungary, Iceland, Italy, Latvia, Sweden, UK (n=10)
No public dedicated STI services available	Liechtenstein, Luxembourg, Slovakia (n=3)	Belgium, Liechtenstein, Luxembourg (n=3)
Missing data	None	Czech Republic (n=1)
Non-participating countries or data not reported	Greece, Poland	Cyprus, Poland, Slovakia

In 2012, all 28 countries reported providers of STI care in addition to public dedicated services. Member States were asked to record the three most common providers in the questionnaire. In 25 countries (89%) gynaecologists were among the most common providers; 23 countries (82%) listed STI/GUM/dermatovenereology clinics; 18 countries (64%) listed urologists; 14 countries (50%) listed family planning or contraception clinics; and, 12 countries (43%) listed general practitioners or family physicians. Only Belgium listed hospital services for infectious diseases as one of the three most common providers and only in Sweden was a medical service for ordering home-sampling tests over the Internet listed among the top three providers. Belgium also listed HIV referral centres and Hungary listed private practitioners without specifying a specialty. Appendix Table 5 shows the most common STI care provider by country and the availability of guidelines. Availability of chlamydia guidelines in specific healthcare settings in a number of countries are further described in Box 2.

The proportion of countries with dedicated public STI services was high in both survey periods, in countries taking part in both surveys: 22 of 25 in 2007 (88%) and 23 of 25 (92%) in 2012. Clinical specialties that provided diagnosis and treatment of chlamydia were similar in 2007 and 2012, as were the locations of the dedicated public services and the number of available clinics. In 2007, fewer countries (10/25; 40%) fulfilled the key indicator 'public dedicated services accessible for symptomatic patients reported in guidelines' than in 2012 (12/25; 48%).

Box 2: Availability of chlamydia guidelines in specific healthcare settings

We determined if guidelines were available for most common setting(s) of chlamydia testing per country (see Appendix Table 5 and 6). In some countries, like Finland, Sweden and UK, specific guidelines for the most common provider are available and the specific guidelines recommended partner notification methods. Other countries did not report specific guidelines for the most common settings of chlamydia testing or partner notification was not recommended in the guidelines. For example, France reported that gynaecology antenatal clinics were the most common setting for chlamydia testing but did not report that this setting had a specific guideline. But France does have a specific guideline for dermatovenereology or GUM clinics, even though these were not reported to be one of the most common settings for chlamydia testing. France also has a guideline for all health care providers, but these do not recommend methods for notifying partners.

Access to chlamydia testing online

Different types of online chlamydia testing services exist in 8 of 27 countries (no data from Luxembourg). Seven countries reported that people could use an online service to make an appointment for sampling in the clinic or laboratory (Bulgaria, Estonia, Finland, Netherlands, Malta, Sweden, UK). In six countries, a home-sampling kit is offered on the internet, and subjects return samples to the laboratory for analyses (Estonia, Finland, Netherlands, Norway, Sweden, UK). In Finland and the Netherlands, people can also buy a rapid chlamydia test online, perform the self-test at home and read their result. The diagnostic quality of these rapid chlamydia home tests is limited and the Netherlands reported that their use is discouraged.

Payment of patient costs for chlamydia and STI care

In all countries (93%, n=26/28), except Bulgaria and Latvia, the national health insurance system covers or reimburses some part of the cost of healthcare services for diagnosis and treatment of individuals with chlamydia (see Appendix Table 7 and Box 3). Eleven countries completely cover the cost of consultation, diagnosis, treatment and partner notification; five countries partly cover these expenses; and in ten countries some parts of the health service are completely, partially and/or not covered or reimbursed. Cost of consultations (n=18/28, 64%) and diagnosis (n=17/28, 61%) are more often covered or reimbursed than cost of treatment (n=10/28, 36%) and partner notification (n=12/28, 43%).

Box 3: Reimbursement of STI health care services costs

Most countries reported that coverage of STI services costs depends on the clinical setting, fulfilment of certain risk criteria, and/or individual income. For example, Ireland only partially covers or reimburses costs for consultations, diagnosis, treatment and partner notification/treatment; costs are completely covered in STI clinics, but not covered in general practitioner consultations. Treatment is free, but there is a €1 fee for the prescription in primary care. In Norway, all costs are covered for those who belong to the risk groups, as defined in the national guidelines, or who have reason to believe they may be infected. In Portugal, coverage depends on individual income and the clinical setting.

Changes in payment system for services for patients with chlamydia in the last two years

Four countries reported that the patient's contribution increased in the last two years. In the Netherlands, for example, costs are only covered at STI clinics and national health insurance pays for testing at the general practitioner if the cost exceeds the patient's own deductible (annual). Beginning in 2013, access to STI clinics was restricted to groups at high risk of infection. People who want anonymous STI testing but do not have a high risk profile are no longer covered. People <25 years without additional risks receive only a chlamydia test which, if positive, qualifies the patient for testing for gonorrhoea, syphilis and HIV. Only Germany noted that patients' own contributions decreased. Patients had paid €10 every three months for medical consultations, but this stopped in 2013.

Laboratory diagnosis of *C. trachomatis*

Key indicator 9. Laboratories use reliable diagnostic tests for chlamydia

Key indicator 10. Laboratories take part in a recognised quality control programme

Nucleic acid amplification tests were considered to be the most reliable chlamydia laboratory diagnostic tests [44]. In 2012, NAATs were available in all 28 European countries that participated in the survey. In 23 countries (82%), NAATs were accessible in the public sector. NAATs were available in all countries in the private sector. In 22 countries (79%), the most common testing method in the public sector was NAAT. In five countries (21%), the most common testing method was ELISA, direct immunofluorescence microscopy and/or chlamydia culture. The Czech Republic reported that only 25–49% of all tests for chlamydia diagnosis were done by NAAT, but indicated that NAATs were the most common method for diagnosing chlamydia in the public sector.

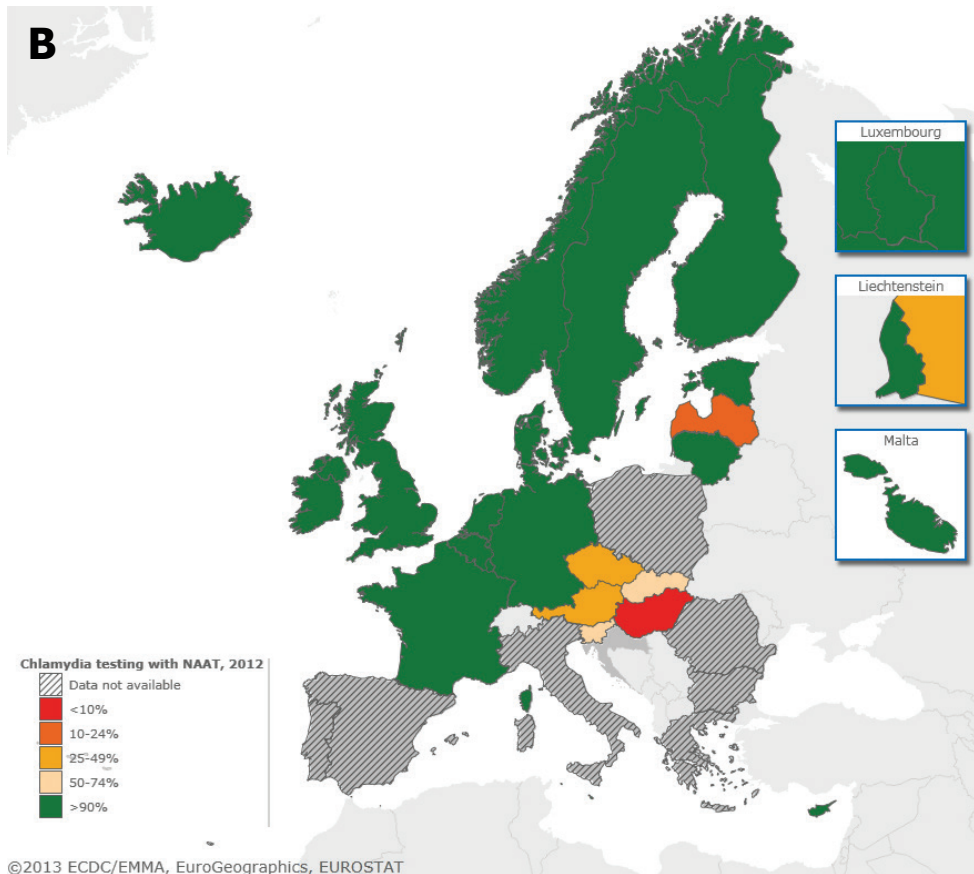
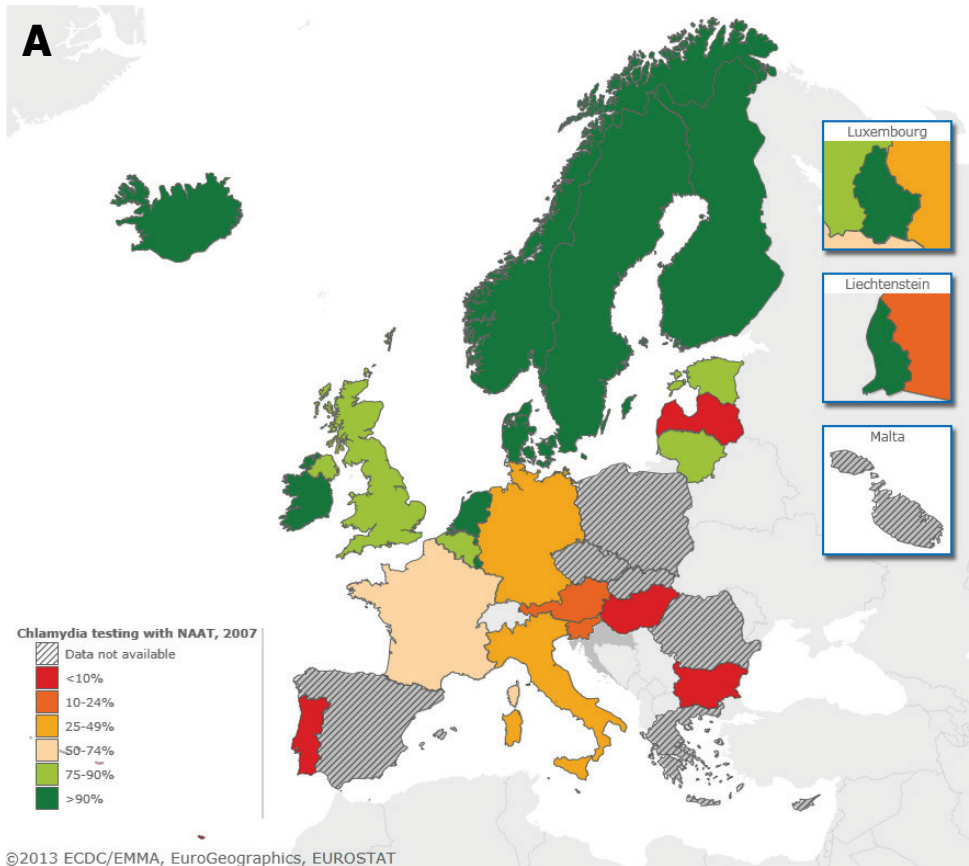
In 2012, 17 of 28 countries (61%) used a NAAT for more than 90% of all chlamydia tests. In four countries NAAT tests were used less than 50% of the time (Table 13). Five countries could not provide information on the proportion of samples tested using NAATs.

Amongst the 25 countries that took part in both surveys, in 2007, NAATs were available in these countries, but only nine out of 25 countries (36%) used NAATs more than 90% of the time compared with 16 of 25 countries (64%) in 2012. Four countries did not report the percentage of samples tested by NAAT in 2007. An overview of the EU/EEA countries using NAATs in 2007 and 2012 is shown in Figure 2.

Table 13. Percentage of chlamydia tests analysed using NAAT

Percentages	Countries 2012 (N=28)	Countries 2007 (N=27)
<10%	Hungary (n=1)	Bulgaria, Hungary, Latvia, Portugal (n=4)
10-24%	Latvia (n=1)	Austria, Slovenia (n=2)
25-49%	Austria, Czech Republic (n=2)	Germany, Italy (n=2)
50-74%	Slovakia, Slovenia (n=2)	France (n=1)
75-90%	None	Belgium, Estonia, Lithuania, UK (n=4)
>90%	Belgium, Cyprus, Denmark, Estonia, Finland, France, Germany, Iceland, Ireland, Liechtenstein, Luxembourg, Lithuania, Malta, Netherlands, Norway, Sweden, UK (n=17)	Denmark, Finland, Iceland, Ireland, Liechtenstein, Luxembourg, Netherlands, Norway, Sweden (n=9)
Not known	Bulgaria, Italy, Portugal, Romania and Spain (n=5)	Greece, Malta, Romania, Spain (n=4)
Missing data	None	Czech Republic (n=1)
Non-participating countries or data not reported	Greece, Poland,	Cyprus, Poland, Slovakia

Figure 2. Map of the EU/EEA indicating the proportion of chlamydia tests performed with NAAT in (A) 2007 and (B) in 2012



By 2012, nine of 28 countries (32%) reported a national quality assurance programme for chlamydia diagnosis. In 18 of 28 countries (64%), some laboratories participated in an international quality assurance programme. In four countries (15%), all laboratories participated in an international quality assurance programme (Table 14).

In comparison with 2007, the number of countries that implemented international laboratory quality control increased from 16 of 25 (64%) in 2007 to 19 of 25 (76%) in 2012 (Table 14). More countries (9/25, 36%) had a national quality assurance programme in 2012 than in 2007 (6/25, 24%). Norway couldn't say whether or not its laboratories participated in an international quality assurance programme in 2007 or 2012.

Table 14. Participation in a quality assurance programme for molecular diagnostic tests

Quality assurance programme		Countries 2012 (N=28)*	Countries 2007 (N=27)*
National schemes		Belgium, Bulgaria, Finland, France, Malta, Portugal, Romania, Sweden, UK† (n=9)	Finland, France, Liechtenstein, Netherlands, Sweden, UK (n=6)
International schemes	Limited to some laboratories	Austria, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, France, Germany, Hungary, Iceland, Italy, Latvia, Lithuania, Malta, Netherlands, Portugal, Slovenia, Sweden (n=18)	Austria, Belgium, Denmark, Estonia, France, Hungary, Iceland, Italy, Latvia, Netherlands, Portugal, Slovenia, Sweden (n=13)
	All laboratories	Belgium, Finland, Ireland, UK (n=4)	Finland, Ireland, UK (n=3)
Not in a scheme		Liechtenstein, Luxembourg, Spain (n=3)	Bulgaria, Germany, Greece, Lithuania, Luxembourg, Romania, Spain (n=7)
Not known or missing data		Norway (n=1)	Czech Republic, Malta, Norway (n=3)
Non-participating countries		Greece, Poland	Cyprus, Poland, Slovakia

* Member States could take part in more than one scheme and appear in more than one row

† Wales did not report a 'national' quality assurance programme for molecular chlamydia diagnostics.

Facilities for further characterisation of diagnosed chlamydia infections

Six countries did not respond to the topic 'facilities for further testing of chlamydia' (Bulgaria, Cyprus, Ireland, Liechtenstein, Luxembourg and Malta). In 18 of 22 countries (82%), testing is available for new chlamydia variants that escape detection by routine NAATs because their genome has mutated (for instance, the unexpected appearance of a new variant in Sweden) [45]. In four countries (18%; Estonia, Hungary, Norway and Romania) these tests are not available. Three countries (14%; Latvia, Lithuania and Slovakia) also indicated that they have no capacity to detect lymphogranuloma venereum strains of *C. trachomatis*.

The capacity to assess resistance of *C. trachomatis* to antibiotics is available in only eight countries (36%) and unavailable in 14 (64%). Fourteen countries (64%) have the capacity to carry out cell culture and eleven countries (50%) can do genovar typing of the *C. trachomatis* outer membrane protein, ompA. In seven countries (32%; France, Italy, the Netherlands, Portugal, Slovenia, Sweden and UK), all these facilities for further testing of chlamydia are available.

Surveillance

Key indicator 11. Surveillance of chlamydia cases is in place and trends in specific groups are analysed

Key indicator 12. Surveillance of chlamydia testing is done and high and lower risk groups are covered

Key indicator 13. Data about occurrence of potential complications from chlamydia, such as PID, ectopic pregnancy and infertility are monitored

Twenty-five of 28 countries (89%) reported that surveillance of chlamydia cases and monitoring within specific groups was in place. Eighteen countries (64%) indicated chlamydia cases were reported from all settings and that reporting was compulsory by law, decree or regulation (Table 15). Reporting was done in selected settings for routine surveillance purposes in seven countries (25%). There was no system for surveillance of chlamydia cases reported from Austria and Portugal (7%). Spain is in the process of changing to compulsory reporting for all settings (Box 4).

Table 15. Surveillance systems for reporting chlamydia cases

Reporting	Countries 2012 (N=28)	Countries 2007 (N=27)
All settings, compulsory	Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, Iceland, Ireland, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Norway, Romania, Slovenia, Sweden, UK* (n=18)	Denmark, Estonia, Finland, Hungary, Iceland, Ireland, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Norway, Romania, Slovenia, Sweden (n=15)
All settings, optional	None	Bulgaria, UK (n=2)
Selected settings, routine surveillance purposes	Belgium, France, Germany, Hungary**, Italy, Netherlands, Spain [^] , Slovakia [†] (n=7)	Belgium, France, Germany, Italy, Netherlands (n=5)
No system	Austria, Portugal (n=2)	Austria, Portugal, Spain (n=3)
Missing data	None	Czech Republic, Greece (n=2)
Non-participating countries or data not reported	Greece, Poland	Cyprus, Poland, Slovakia

* In England, reporting is compulsory from all settings. In Scotland and Northern Ireland, all laboratories can report, but reporting is optional. In Northern Ireland reporting is compulsory for GUM clinics;

** Hungary: reporting is compulsory for the settings participating in the sentinel system; efforts are being made to change to a comprehensive surveillance;

[^]Spain: in 2013 system will change to comprehensive surveillance (mandatory from all settings);

[†] Slovakia has mandatory universal case reporting according to the ECDC surveillance report [1].

In the 2012 questionnaire, some countries indicated that high-risk groups were over-represented in the surveillance system, due to the methods and the venues for data collection for surveillance. Young people were over-represented in Finland, the Netherlands and the UK. In the Netherlands, men who have sex with men and behavioural risk groups were also over-represented in national surveillance.

Box 4: Surveillance systems

In the current study, Austria and Portugal indicated they had no system for surveillance/monitoring of chlamydia cases. Austria explained the absence of a surveillance system by stating that reporting of chlamydia is not compulsory. However, Austria reported 1004 cases to TESSy in 2011 and noted in the current study that commercial sex workers are over-represented in the STI surveillance.

Portugal noted that a laboratory surveillance system that should have been implemented in 2011 has been delayed.

In Spain, the current surveillance system collects chlamydia diagnoses reported from laboratory systems, but adherence is voluntary and there is no national coverage. A newly developed surveillance protocol for chlamydia will be implemented in the near future and new legislation make reporting chlamydia mandatory.

Romania reported the limitations of their own surveillance and monitoring system. They illustrate the difference between regulation and implementation/daily practice: "...reporting is compulsory for all clinics in which chlamydia is diagnosed, however, only a few cases reach the national statistics centre".

The types of national surveillance systems in the participating EU countries were similar in 2012 and 2007. Among the 25 countries covered in both surveys, slightly more countries had mandatory reporting from all healthcare settings in 2012 (16/25; 64%) than they had in 2007 (15/25; 60%). In 2007, reporting was optional in Bulgaria for all settings, but was mandatory in 2012. In 2012 complete reporting from GUM clinics was also mandatory in 2012 and all National Chlamydia Screening Programme venues in England in the UK collected data to monitor screening. A minority of countries (5 of 25 in 2007 (20%) and 6 of 25 in 2012 (24%)) reported cases from selected settings for routine surveillance purposes in 2007 and in 2012, or had no system for reporting chlamydia cases (3 (12%) and 2 (8%)). Spain changed from no system for reporting in 2007, to selected settings in 2012; plans exist for a national coverage in the future.

Data on the percentage of infected patients receiving antibiotic treatment are not collected for monitoring purposes in any of the countries in the survey. Data on percentages of partners of infected patients who receive partner notification are collected for monitoring purposes in Lithuania and the Netherlands (see Box 5).

Box 5: Monitoring partner notification outcomes

Lithuania's contact reported that collecting data on sexual partners is part of its national STI surveillance. In 2011, partner notification was initiated in 68% of chlamydia cases and 145 contacts were identified; the system does not report however, numbers of partners tested or treated. In 2011, Lithuania reported 343 chlamydia cases to ECDC (TESSy), only two of them were detected through partner notification.

The national STI surveillance system in the Netherlands contains information on all STI consultations in 26 STI clinics, including persons referred through partner notification. Analyses of the national surveillance database showed that partner notification is an important element of chlamydia control: chlamydia positivity rates are two to three times higher among notified clients than other clients. About a third of all newly diagnosed chlamydia infections at the 26 STI clinics were detected through partner notification. The Netherlands started a study on registration of partner notification in five STI clinics. The study did not focus on chlamydia, but on other STIs (HIV, syphilis and gonorrhoea), in 2010–2012. It found that about 63% of partners of infected heterosexual men, and 87% of partners of infected women were notified. When contact information was available, 92% of partners were notified.

The UK contact reported that in April 2012 it had stopped collecting data on partner notification outcomes at the national level, and that partner notification outcomes should be audited at local level.

In 2012, 10 of 28 countries (36%) collected data on clinical complications that might have been caused by chlamydia, and five countries (18%) also reported these data as part of routine surveillance (Table 16). The sources of the data were not listed (e.g. general practice, hospital) and the reports may not be complete. The complications they listed included PID (seven countries; 25%), ectopic pregnancy (five countries; 18%), infertility (three countries; 11%) and epididymitis (two countries; 7%).

Amongst the countries taking part in both surveys, seven of 25 countries (28%) in 2007 collected data on clinical complications that might have been caused by chlamydia, and two countries (8%) reported these data in routine surveillance. They listed complication that included PID (six countries; 24%, in Belgium limited to sentinel surveillance), ectopic pregnancy (six countries; 24%), infertility (five countries; 20%) and epididymitis (five countries; 20%). By 2012 Italy had begun to monitor PID. Denmark reported that it collects data on complications, but did not indicate which complications it tracked. In Sweden, information on potential complications can be extracted from registration of in-patient visits at public hospitals, but this is not linked to chlamydia case surveillance.

Table 16. Data about complications associated with chlamydia infection

Complication	Countries 2012 (N=10)*	Countries 2007 (N=7)*
Any	Belgium, Denmark, Estonia, France, Ireland, Italy, Netherlands, Slovenia, Sweden, UK† (n=10)	Belgium, Estonia, Ireland, Netherlands, Slovenia, UK (n=6)
PID	Belgium, Estonia, Ireland, Italy, Netherlands, Slovenia, UK† (n=7)	Belgium, Estonia, Ireland, Netherlands, Slovenia, UK (n=6)
Ectopic pregnancy	France, Ireland, Netherlands, Slovenia, UK* (n=5)	Estonia, France, Ireland, Netherlands, Slovenia, UK (n=6)
Infertility	Estonia, Ireland, Netherlands (n=3)	Estonia, Ireland, Netherlands, Slovenia, UK (n=5)
Epididymitis	Ireland, Netherlands(n=2)	Estonia, Ireland, Netherlands, Slovenia, UK (n=5)

PID, pelvic inflammatory disease; GUM, genitourinary medicine;

** Countries not reporting complications not listed. Countries reporting complications can appear in more than one row;*

† In England, PID is reported in GUM clinics routinely; ectopic pregnancy data are collected from hospital and a selection of primary care clinics. Scotland and Northern Ireland data on complications are not (routinely) collected, though Scotland collects data on PID and ectopic pregnancy for whom hospital admission is required. In Wales, data are collected and reported on PID and ectopic pregnancy. In England and the Netherlands, data are not collected as part of surveillance, but evaluation includes monitoring of routine data for PID and ectopic pregnancy.

Twenty three of the 28 countries (82%) were reporting chlamydia cases to the ECDC (TESSy) at the time of the survey; Czech Republic, France, Germany, Liechtenstein and Portugal did not report to TESSy in 2011 [1]. We asked whether these data cover all chlamydia infections reported in the national surveillance, and we asked for an expert opinion on the completeness of reporting. Most countries (18/23; 78%) report all data on chlamydia infections that are available in the national surveillance system. However, Belgium, Hungary, the Netherlands and Spain noted that the data they reported to TESSy were incomplete (France did not provide information on coverage). In Belgium, 60% of the country's population is covered by the national surveillance system; in the Netherlands 35% is covered; and in Spain <20% is covered. Country comments about the completeness of their data on chlamydia infections are provided in Box 6.

Box 6: Country comments: how complete are the data on chlamydia in your country, as reported to the ECDC, in respect of coverage of the total number of cases detected annually

Denmark, Finland, Iceland, Ireland, Lithuania, Norway, Sweden and UK described their collection as "100%" or "complete". For example, Ireland wrote:

"It will be fairly complete from 2013 on, as we have begun to collect case based information electronically from labs directly. Labs are legally required to notify chlamydia infections. Previously, the data was clinic based, aggregate, and untimely".

Belgium, Estonia and Slovakia estimated that approximately 60-70% of diagnosed cases are reported.

Other countries also indicated that the chlamydia data reported to TESSy were incomplete, and that they may have over-represented risk-groups:

Cyprus	<i>"Generally, there is under-reporting, especially by the private sector".</i>
Italy	<i>"As estimated by GUM clinics 6%, as estimated by laboratory-based surveillances system is 2%".</i>
Malta	<i>"There is under-reporting and inadequate testing from general practitioners and under-reporting from gynaecologists. The vast majority of cases are reported from the GUM clinic".</i>
The Netherlands	<i>"The data we report to ECDC are only the cases detected at the STI centres; this is approximately one third of the STI-consultations in the country (based on estimates from GP surveillance). The patient-population at the STI centres is more high-risk than at the GP's".</i>
Slovenia	<i>"We recently assessed the sensitivity of our chlamydia surveillance system (universal mandatory reporting by physicians). In one laboratory, 36% of all cases were reported to the national surveillance system. The conclusion is that the sensitivity of the surveillance system is very low".</i>

Respondents from Austria, Latvia and Spain did not know how complete their data on chlamydia were.

Latvia	<i>"According to the legislation, reporting data on chlamydia infection is mandatory for all dermatovenereology, gynaecology, urology and all laboratory in Latvia (since 2008). But the national coverage is unknown".</i>
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Additional comments referred to the challenges of interpreting TESSy data.

France	<i>"In our point of view, 1) it is inappropriate adding up the chlamydia cases from comprehensive and sentinel systems, and thus to present a total number of cases. 2) The numbers of chlamydia cases from UK (around 60% of all EU cases) distort the total number of cases and the ratios per 100.000. For example, the curve of chlamydia cases per 100.000 is shaped by the UK screening program. 3) The number of chlamydia cases and the male-to-female ratio are highly influenced by testing and screening practices in countries, in so far as these practices are changing with time".</i>
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Assessment of chlamydia prevention and control activities

Self-assessment by Member States

Member States self-reported their level of chlamydia control activities (criteria for levels A to D in Table 2 and Appendix Table 2). The levels reported here are broadly consistent with the ECDC guidance document [12] but level B in this self-assessment includes two Member States whose case management guidelines do not address partner notification (Table 17). In addition, level A includes Member States that do primary STI activities even if these activities are not described in a strategy or plan.

Table 17. Member States' self-assessed level of chlamydia control

Level*	Countries (N=28)	Comment
Level A	Cyprus, Hungary, Lithuania, Portugal, Slovakia, Slovenia (n=6)	Hungary, Portugal, Slovakia and Slovenia do not have a strategy or plan for primary STI prevention.
Level B	Austria, Belgium, Czech Republic, Denmark, Estonia, Italy, Liechtenstein, Romania, Spain (n=9)	Austria, Estonia, Italy and Spain do not have a strategy or plan for primary STI prevention; Belgium and Italy have case management guidelines that do not address partner notification.
Level C	Finland, France, Iceland, Malta, Netherlands, Norway, Sweden (n=7)	Iceland does not have a strategy or plan for primary STI prevention.
Level D	Germany, UK (England only)† (n=2)	Germany does not have a strategy or plan for primary STI prevention.
Does not fit any category	Bulgaria, Ireland, Latvia (n=3)	Bulgaria has a primary STI prevention strategy and case management guidelines that recommend PN; Ireland and Latvia do not have a strategy for primary STI prevention; Ireland does not have case management guidelines
Missing data	Luxembourg (n=1)	
Non-participating countries	Greece, Poland	

* The levels here are not completely consistent with the ECDC guidance document [12].

† Wales and Scotland reported category C and Northern Ireland reported category B.

Six of 27 countries (22%) self-reported themselves as Level A (primary prevention). Nine countries (30%) described themselves as Level B (case management guidelines). Seven countries (26%) described themselves as Level C (opportunistic screening). Two countries (7%) described themselves as Level D (organised screening programme). Three countries reported that they did not fit in any category. Luxembourg did not provide this information because this question was not in the 2007 survey.

Most Member States (18/28, 64%) assessed themselves as having activities at level B or above, including Belgium and Italy whose case management guidelines do not address partner notification. Six countries (Austria, Estonia, Germany, Iceland, Italy, Spain) at level B or above do not have a strategy or plan that addresses primary STI prevention and three countries (Liechtenstein, Malta, Romania) have a strategy for primary STI prevention but this does not specifically mention chlamydia (Table 6).

Countries indicated the strengths and weaknesses of their chlamydia control activities. Twelve of 26 countries (46%) stated that their primary prevention activities (such as health promotion) for STIs in general, and specifically for chlamydia are 'adequate, but could be improved'; ten countries (38%) stated that these activities are 'basic'; four countries (15%) said such activities are 'not done'. Twelve countries (46%) said that opportunistic testing of asymptomatic individuals from specific groups at risk of chlamydia is 'available but limited'. Six countries (23%) said that opportunistic screening is 'not done'; four (15%) said it is 'infrequent and difficult to access'; and four countries (15%) said that it is 'standard practice'. The UK reported the National Chlamydia Screening Programme in England as 'well-established and implemented'. The Czech Republic, Denmark and Norway said that screening is 'done, but not implemented in an organised programme'.

Box 7 contains selected comments giving reasons for Member States' self-assessments.

Box 7: Strengths and weaknesses of chlamydia control activities

In brackets is the response category chosen by the respondent

Primary prevention activities

England ('adequate')

"Sex and relationships education is provided at schools, active youth charities promote sexual health (e.g. Brook, [Family Planning Association]), state health providers promote sexual health, previous media campaigns (e.g. sex worth talking about) and a new campaign anticipated. Surveys show greater awareness of chlamydia, but it can always be improved"

Belgium ('basic')

"Spread of posters towards health care providers via a medical journal, there is a website where teachers can find educational material on sexual health and the [non-governmental organisation] offer education material in a library. BUT: there are no field visits towards schools or first line health care providers in order to stimulate them to use the prevention tools, there is no specific education offered to teachers and first line health care providers to increase their communication competence on sexual health and sexual behaviour".

Opportunistic screening of asymptomatic individuals

Latvia ('standard practice')

"Opportunistic screening is standard practice, but only for pregnant women".

Norway ('available but limited')

"National guidance gives clear recommendations on who should get tested for chlamydia. However, we do not know to what extent doctors offer chlamydia tests to patients who visit health care for other purposes."

An organised chlamydia screening programme

Germany ('done, but not implemented in an organised programme')

"Gynaecologists are asked to offer the test, but they lack the time for counselling and probably do not offer the test".

Malta ('planned/in development')

"We have a programme targeting 18-35 year old asymptomatic persons but it is still in its early stages".

Netherlands ('not done')

"The effectiveness of systematic screening has been studied in a large trial on annual screening in three regions in the Netherlands from 2008-2011. The results showed that the systematic screening was not (cost) effective enough to roll out at national scale".

Categories assigned by the survey team

Table 18 shows the categories of chlamydia control activities to which the survey team assigned each country, based on the outcomes of the key indicators, answers to additional questions and criteria (Table 1). Nineteen of 28 (68%) Member States have at least the ECDC suggested minimum level of chlamydia control activities.

Six out of 28 countries (21%; Ireland, Luxembourg, Malta, Portugal, Slovakia and Slovenia) were determined to have no organised chlamydia control activity because they reported no available case management guidelines. Ireland and Portugal were included in this category because they had no guidelines, despite reporting that they had implemented other control activities. Three out of 28 countries (11%; Belgium, Cyprus and Italy) were determined to have case management guidelines that did not cover partner notification. Five countries (18%; Czech Republic, Estonia, Hungary, Liechtenstein, Romania, Spain), were determined to have case management guidelines including partner notification. Thirteen countries (46%; Austria, Bulgaria, Denmark, Estonia, Finland, France, Germany, Iceland, Latvia, Lithuania, Netherlands, Norway, Sweden) were determined to have opportunistic testing for selected asymptomatic individuals, in addition to case management guidelines addressing partner notification. One country (4%; UK) was determined to have an organised chlamydia screening programme.

Table 18. Category of chlamydia control activities assigned to the 28 participating EU/EEA Member States

Category, (N=28)	Countries	Comments
Category 1: No organised chlamydia control activity (n=6)		
	Ireland	No case management guidelines. Opportunistic screening is a standard practice.
	Luxembourg	No case management guidelines.
	Malta	No case management guidelines.
	Portugal	No case management guidelines. Partner tracing and testing implemented occasionally but not routinely.
	Slovakia	No case management guidelines.
	Slovenia	No case management guidelines.
Category 2: Case management guidelines (n=3)		
	Belgium	Case management guidelines/recommendations are available, but do not include recommendations on partner notification. They recommend opportunistic testing for some groups, which is done in specialised centres. Pregnant women are tested in gynaecology/antenatal clinics, but not routinely.
	Cyprus	Case management guidelines are available, but do not include recommendations on partner notification.
	Italy	Case management guidelines available, but no information on partner notification. They recommend screening pregnant women.
Category 3: Case management guidelines, including partner notification (n=5)		
	Czech Republic	Case management guidelines are available and mention partner management. Testing of 'asymptomatic' groups was reported for patients with other STIs (we would not consider these asymptomatic).
	Hungary	Case management guidelines available and partner notification is mentioned. Testing of asymptomatic partners of STI patients is recommended in guidelines.
	Liechtenstein	Case management guidelines (from Switzerland) include partner notification.
	Romania	Case management guidelines available and mention partner management, methods are specified in the guidelines. Testing of asymptomatic groups is specified in the guidelines, but not really implemented.
	Spain	Case management guidelines available and partner management is mentioned. Asymptomatic groups are not recommended to be tested in the guidelines.
Category 4: Opportunistic testing (n=13)		
	Austria	Case management guidelines are available and mention partner notification. Recommendations include the opportunistic screening of pregnant women.
	Bulgaria	Case management guidelines are in development, expected in 2012. They specify partner notification and asymptomatic groups for testing.
	Denmark	Case management guidelines are available and include partner notification. Limits testing of asymptomatic individuals to women who have specific medical procedures (abortion, IVF, etc.) Opportunistic screening is 'infrequent and difficult to access'; screening is done 'sporadically'.
	Estonia	Case management guidelines are available. Partner management and counselling are mentioned. Screening of pregnant women is recommended.
	Finland	Case management guidelines are available and mention mandatory partner management. Specifies asymptomatic groups for opportunistic testing.
	France	Case management guidelines include partner management. Groups for opportunistic testing are specified.
	Germany	Case management guidelines are available. Partner management is mentioned in the urology guideline only, but no specific partner notification method suggested. The gynaecology guideline recommends opportunistic testing of asymptomatic women <25 years and pregnant women. This has been implemented at the national level since 2008 with reimbursement of costs through national insurance.
	Iceland	Case management guidelines include partner management. Specifies asymptomatic groups of patients for opportunistic testing.
	Latvia	Case management guidelines include partner notification. Recommends that pregnant women be tested. Also recommends that sexually active persons be tested, but this is not done.
	Lithuania	Case management guidelines include 'mandatory' partner management, but do not specify methods. Guidelines specify which asymptomatic groups specified should be tested.
	Netherlands	Case management guidelines include partner management. Recommends opportunistic screening for specific high-risk groups of asymptomatic persons.
	Norway	Case management guidelines include partner management. Specifies asymptomatic groups at risk.
	Sweden	Case management guidelines are available and include mandatory partner management. Opportunistic testing is available and implemented for asymptomatic persons; specifies asymptomatic groups at risk.
Category 5: Screening programme (n=1)		
	UK	Case management guidelines are available and include partner management. An organised screening programme is implemented in England only.

IVF, *in vitro* fertilisation; PN, *partner notification*.

In 2007, 11 of the 27 (41%) EU/EEA Member States had not organised chlamydia control activities (category 1), five (19%) had case management guidelines for diagnosed cases (category 2), three countries (11%) had case management, including partner notification (category 3), six (22%) had opportunistic testing for at least one group of asymptomatic people (category 4) and two (7%) had a pilot or established screening programme (category 5). For 25 countries that participated in both surveys (n=25, Table 19), the number of countries that reached the minimum level of chlamydia control activities (category 3) was higher in 2012 (18/25, 72%) than in 2007 (11/25, 44%). Nine of the 25 countries (36%) had more intensive chlamydia control activities in 2012 than 2007. Two countries (8%) indicated fewer control activities. In 2007 Belgium reported that it had guidelines including partner management for general practitioners (category 3) but in 2012, stated that there were no recommendations about partner notification in the guidelines for all healthcare providers or for gynaecology. The Netherlands now has opportunistic chlamydia testing because systematic screening was judged not to be cost-effective. The overview of changes between 2007 and 2012 in the number of countries in each category and the level of control activities in different countries is shown in Figures 3 and 4.

Table 19. Comparison between 2007 and 2012 categories of chlamydia control activities

Chlamydia control category	Countries 2012 (N=28)	Countries 2007 (N=27)*
No organised chlamydia control activity	Ireland, Luxembourg, Malta, Portugal, <i>Slovakia</i> , Slovenia (n=6)	Bulgaria, Finland, <i>Greece</i> , Ireland, Liechtenstein, Luxembourg, Malta, Portugal, Romania, Slovenia, Spain, (n=11)
Case management guidelines	Belgium , <i>Cyprus</i> , Italy (n=3)	Austria, Czech Republic, Germany, Italy, Lithuania (n=5)
Case management including PN	Czech Republic , Hungary, Liechtenstein , Romania , Spain (n=5)	Belgium, France, Hungary (n=3)
Opportunistic testing	Austria , Bulgaria , Denmark, Estonia, Finland , France , Germany , Iceland, Latvia, Lithuania , Netherlands , Norway, Sweden (n=13)	Denmark, Estonia, Iceland, Latvia, Norway, Sweden, (n=6)
Screening programme	UK (n= 1)	Netherlands, UK (n=2)

PN, partner notification

Countries shown in **bold** had different levels of chlamydia control in 2007 and 2012. Countries shown in *italics* did not participate in 2012 (column 2007) or in 2007 (column 2012).

* Categories in 2007 taken from publication [39].

Figure 3. Number of EU/EEA countries in each category of chlamydia control activities in 2007 and 2012

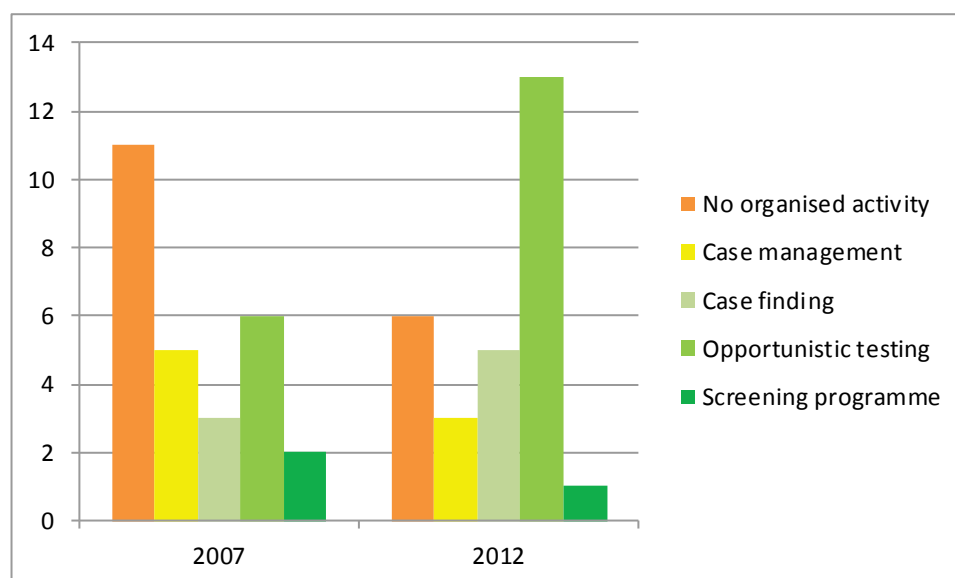
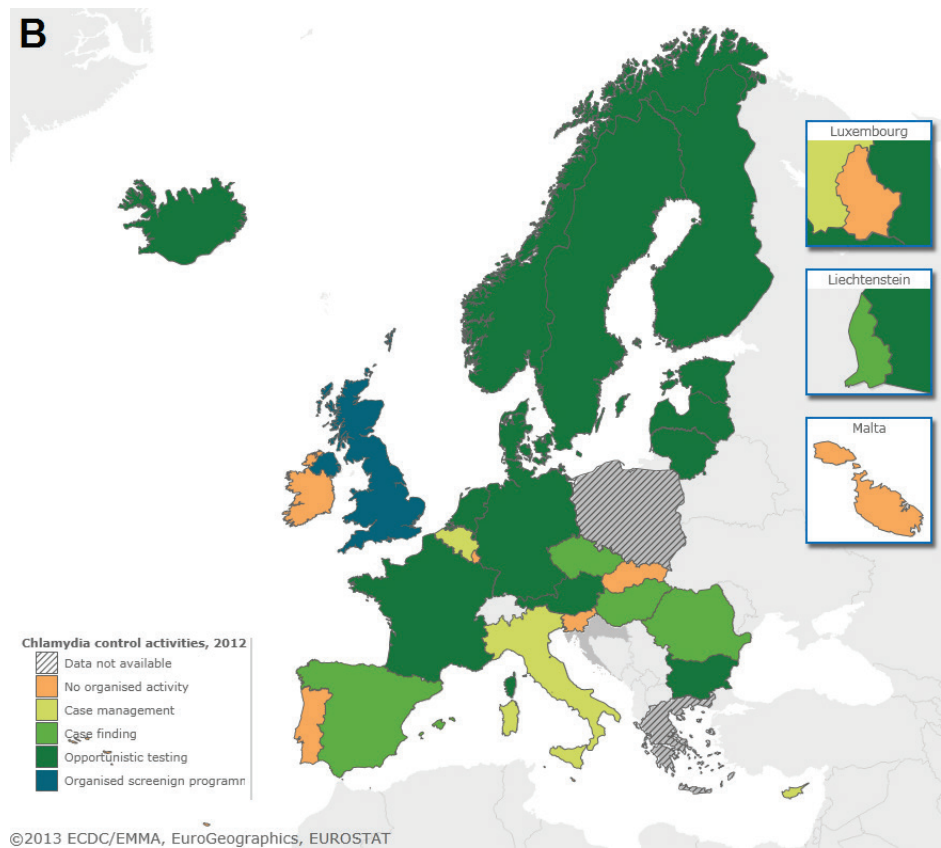
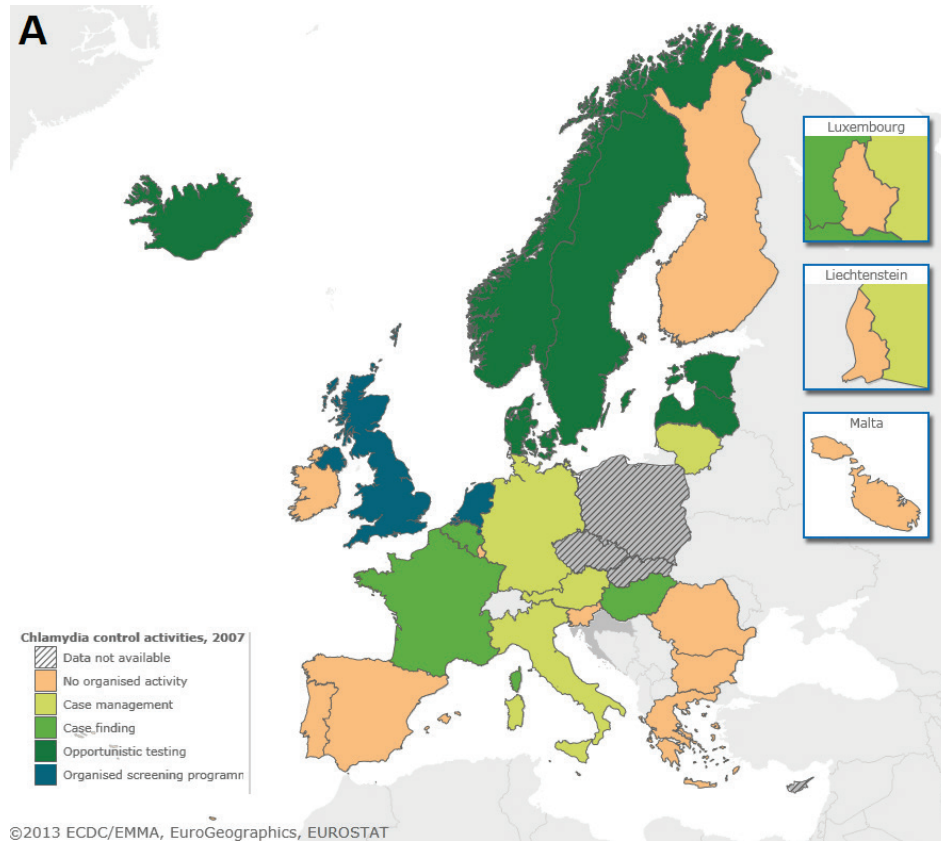


Figure 4. Category of chlamydia control activities (A) in 2007 and (B) 2012 in the EU/EEA



Comparison between self-assessed and assigned categories in 2012

There are some differences between the self-assessed levels and assigned categories of chlamydia control activities in 27 Member States with both a self-assessment and assigned category (Table 20). In this comparison, levels A and B do not correspond precisely with categories 1 to 3, but level C is equivalent to category 4 and level D is equivalent to category 5 (Tables 2).

Table 20. Category of chlamydia control activities assigned by survey team (categories 1 to 5) compared with country self-assessment (levels A to D)

Category of chlamydia control activities	Level A (primary prevention)	Level B (case management including PN)	Level C (opportunistic testing)	Level D (organised screening programme)	Not fitting in level A-D or data not available
Category 1: No organised control activities					
Ireland					X
Luxembourg					NA
Malta			X		
Portugal	X				
Slovakia	X				
Slovenia	X				
Category 2: Case management guidelines					
Belgium		X			
Cyprus	X				
Italy		X			
Category 3: Case management including PN					
Czech Republic		X			
Hungary	X				
Liechtenstein		X			
Romania		X			
Spain		X			
Category 4: Opportunistic testing					
Austria		X			
Bulgaria					X
Denmark		X			
Estonia		X			
Finland			X		
France			X		
Germany				X	
Iceland			X		
Latvia					X
Lithuania	X				
Netherlands			X		
Norway			X		
Sweden			X		
Category 5: Organised screening programme					
UK*				X	

NA, not applicable because Luxembourg did not complete a self-assessment; PN, partner notification:

* England.

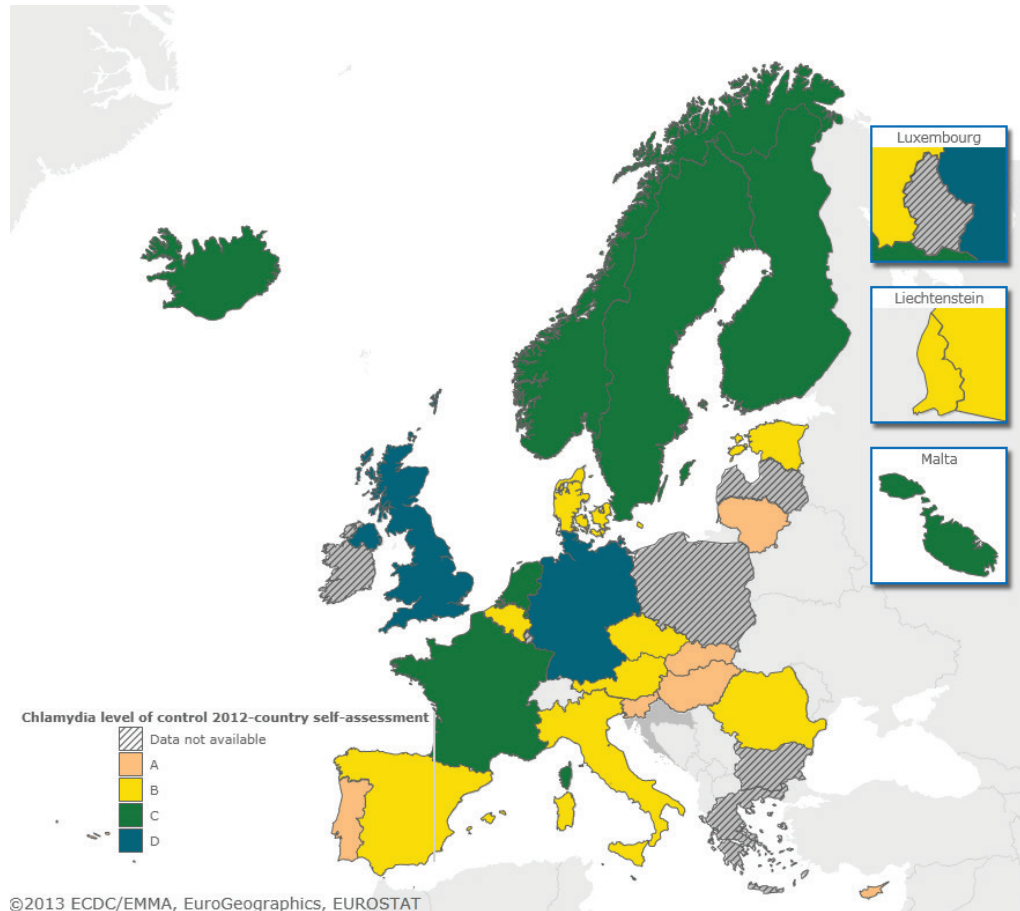
Six countries out of 27 (22%) assigned themselves to a level with less intensive activities than those assigned by the survey team. Cyprus assessed itself as level A, but has clinical case management guidelines, so was assigned to category 2. Hungary assessed itself as level A, but has guidelines that include a recommendation about partner notification, so was assigned to category 3. Lithuania (level A) and Austria, Denmark and Estonia (level B) also assessed their activities as less intensive than the survey team's assessment (category 4/level C).

Four countries out of 27 (14%) selected a level describing activities more intensive than the survey team's assessment. Italy and Belgium assessed themselves at level B, although their case management guidelines do not address partner notification (category 2). Malta assessed itself as level C but does not yet have a case management guideline so the survey team assigned category 1 ('no organised chlamydia control activities'). Germany categorised their control activities as level D (category 5), but the survey team assessed the chlamydia testing offered to women as 'opportunistic testing' (category 4) (see also paragraph 2.2.4).

Three countries (Bulgaria, Latvia and Ireland) could not find correspondence between their activities and any of the levels A to D. The survey team assessed Ireland in category 1 based on absence of case management guidelines although opportunistic screening was reported. Based on the existence of case management guidelines mentioning partner notification and recommendation for opportunistic testing of asymptomatic groups, Bulgaria and Latvia were assigned category 4.

An overview of the level of control activities in different countries by self-assessment is shown in Figure 5.

Figure 5. Chlamydia control level in the EU/EEA, 2012 country self-assessment

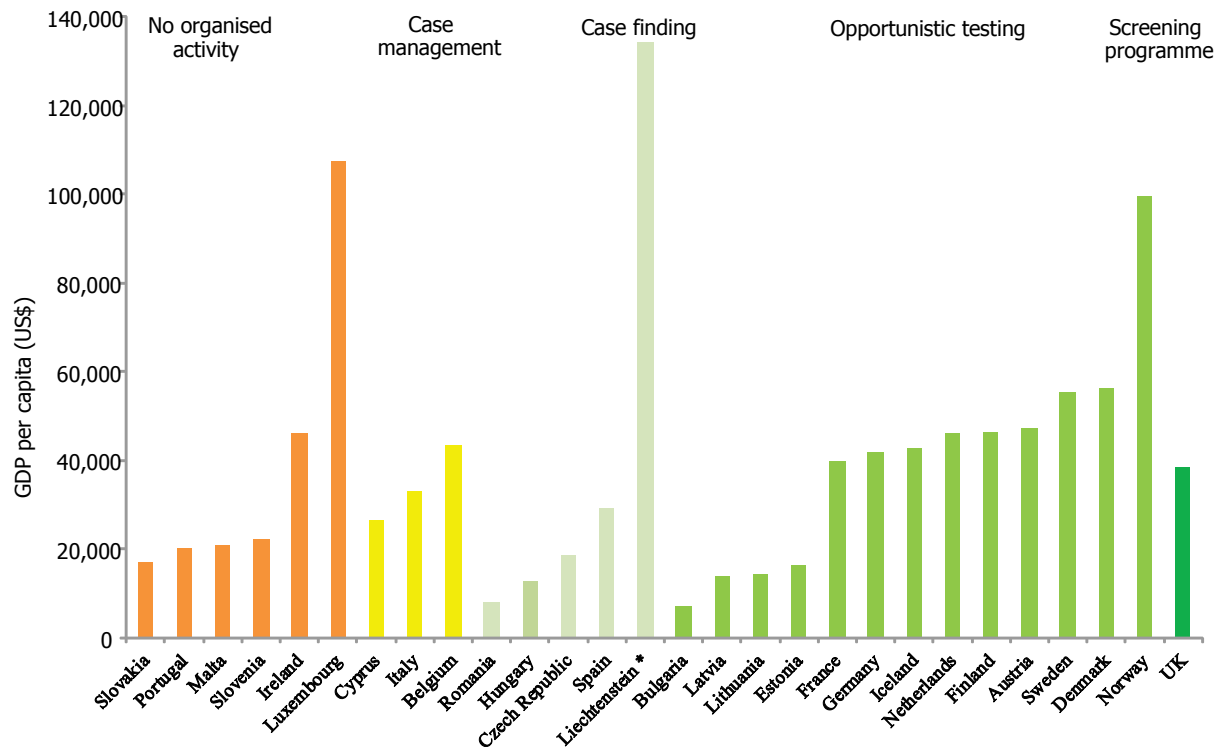


A, No organised chlamydia control activities, primary prevention only; B, Case management, including partner notification; C, Guidelines include opportunistic testing; D, Organised screening programme.

Linking survey responses with secondary data sources

Economic indicators

Figure 6 shows the level of chlamydia control activities by increasing level of national GDP per capita in US\$ [42]. The variation in GDP is large; within the groups of countries stratified by level of chlamydia control, GDP ranges from low to high; four categories include a country with a high GDP (>100,000 US\$ per capita). There was no association between the per-capita GDP of a country and the level of chlamydia control and prevention activities: (level 1) no organised activity, has a mean of 38,895 US\$; for (2) case management, 34,259 US\$; (3) case finding, 40,597 US\$; (4) opportunistic screening, 40,452 US\$; and (5) organised screening (UK only): 38,514 US\$. There was no statistical evidence of a difference between mean GDP in countries categorised at level 1 or 2 (mean: US\$37,349) and category 3 or higher (mean: US\$40,328) (t-test $p=0.81$).

Figure 6. Level of chlamydia control in the EU/EEA by GDP per capita in US\$ (2012) and by country

* For Liechtenstein no information on GDP was available in 2012, the reported GDP is from 2008. UK category applies to England only, GDP level is for the whole of the UK.

Surveillance systems and rates of reported chlamydia infections

Table 21 shows the chlamydia reporting rate by country and by level of chlamydia control activities. Most countries reported that chlamydia case reporting was compulsory from all settings, including those with no other organised chlamydia control activities. Countries with no surveillance for chlamydia were Portugal (no other organised chlamydia control activities), Spain (case management including partner notification) and Austria (opportunistic testing offered to commercial sex workers).

Seventeen of 28 Member States report chlamydia cases to TESSy (Table 21). Member States categorised as having opportunistic chlamydia testing or a screening programme have higher numbers of reported chlamydia cases per 100 000 population than those with less intensive chlamydia control activities.

Table 21. Type of surveillance system for chlamydia and chlamydia cases per 100,000 population reported to TESSy in 2011, by category of chlamydia control

Country (N=28)	Chlamydia cases reported per 100 000 population, TESSy*	All settings, compulsory	Selected settings, optional	No surveillance system
No organised control activities				
Ireland	143	X		
Luxembourg	0.2	X		
Malta	35	X		
Portugal	-			X
Slovakia**	6		X	
Slovenia	11	X		
Case management				
Belgium	-		X	
Cyprus	0.7	X		
Italy	-		X	
Case management including PN				
Czech Republic	-	X		
Hungary	-	X		
Liechtenstein	-	X		
Romania	0.6	X		
Spain	-		X	
Opportunistic testing				
Austria	-			X
Bulgaria	0.7	X		
Denmark	479	X		
Estonia	128	X		
Finland	254	X		
France	-		X	
Germany	-		X	
Iceland	657	X		
Latvia	70	X		
Lithuania	11	X		
Netherlands	-		X	
Norway	458	X		
Sweden	396	X		
Screening programme				
UK	341	X		

* Data reported to ECDC, 2011 by countries with comprehensive surveillance systems [2].

** Slovakia is defined as selected surveillance because the existing mandatory universal surveillance has less than 75% national coverage;

Additional data collected in the 2012 survey

Questions about the 2009 ECDC guidance document will be analysed and reported as part of a planned evaluation of the impact of the guidance document on chlamydia prevention and control in Member States.

Respondents provided information about a small number of population-based surveys of chlamydia prevalence. These are included in the published literature reviews [3].

Discussion

In 2012, EU/EEA Member States were surveyed, and for each country 'key indicators' of chlamydia control activities were assessed. The response rate was 93% (28/30), including a response from Luxembourg stating that its chlamydia control activities had not changed since the 2007 survey.

Summary of main findings

- **Strategy or plan about STI control and primary STI prevention:** 11 of the 28 countries had a strategy or plan, six of which explicitly included chlamydia control. Compared with 2007, four countries had a new strategy or plan document (France, Netherlands, Germany and Liechtenstein). Sixteen of 27 countries replying to this question had a strategy or plan for primary STI prevention, of which nine mentioned chlamydia prevention explicitly.
- **Clinical guidelines for chlamydia case management:** 22 of 28 countries had guidelines covering diagnosis and treatment for one or more medical professional groups. Four countries (Bulgaria, Finland, Spain and Liechtenstein) had developed new guidelines since 2007. Six countries (Ireland, Luxembourg, Malta, Portugal, Slovenia and Slovakia) have no guidelines yet.
- **Partner notification** is addressed in case management guidelines in 19 of 28 countries. Where a specific PN approach was recommended, most countries mentioned patient referral methods.
- **Opportunistic testing:** 18 of 28 countries have clinical guidelines that recommend chlamydia testing for specific groups of asymptomatic people, but only three countries (Latvia, Sweden and the UK) said that the recommendation was fully implemented in routine practice. Target groups for testing include pregnant women (10 countries), young people (10 countries) and other groups (including men who have sex with men, commercial sex workers, migrants, women undergoing abortion).
- **Organised screening programme:** The UK (England) is the only country in 2012 with an organised national screening programme, according to the survey definition. Germany has activities that correspond to opportunistic chlamydia testing. Three countries (France, Luxembourg and Malta) are planning screening programmes. The Netherlands stopped a pilot screening programme in 2012, owing to lack of effectiveness and cost-effectiveness.
- **Health services offering diagnosis and treatment:** Most countries have specialised STI care facilities (25 of 28 countries) and/or other healthcare providers within the general health system (all 28 countries). The situation is similar to 2007.
- **Reliable laboratory diagnostics,** using NAATs, are available in all countries participating in the survey and used for more than 90% of diagnoses in 23 of 28 countries. The use of NAATs has increased since 2007. Most countries using NAATs in 2012 (22/28) participated in an international quality assurance programme.
- **Surveillance:** 26 of 28 countries monitor diagnosed chlamydia cases and time trends in specific groups. Austria and Portugal have no surveillance system, as of 2012.
- **Self-assessment of chlamydia prevention and control activities:** six of 28 countries assess themselves at level A, nine at level B, seven at level C and two at level D (three countries reported that they did not fit into any category and Luxembourg did not answer this question).
- **Assigned category of chlamydia control activity:** Amongst countries taking part in both surveys, more countries in 2012 (72%, 18/25) than in 2007 (44%, 11/25) had chlamydia control activities in at least category 3 (case management including partner notification) than in 2007. This category corresponds broadly to level B, the level that ECDC defined as a minimum standard.

Strengths and limitations

A high survey response rate of 93% (n=28/30) was achieved in 2012, including 25 countries that also participated in 2007. One strength of the 2012 survey of chlamydia control activities, is that new topics and questions were introduced to address important issues, whilst retaining comparability with data from 2007. In particular, the questionnaire asked about primary prevention activities, and Member States were asked to assess their own activities against categories that were broadly aligned to the ECDC chlamydia guidance document [12]. Additional comments from Member States provided contextual information about the actual implementation of prevention and control activities. The cross-tabulation of categories 1 to 5 with levels A to D bridges the two systems of categorisation, but also shows where the systems do not overlap and highlights parts of the definitions that need to be clarified before using them in future surveys.

There are also inherent weaknesses in the survey methods, which limit our ability to draw firm conclusions. Although definitions for specific activities were provided, respondents in different Member States might have interpreted questions and activities differently. For example, the definition of an organised screening programme differs between countries and health systems. To maintain comparability, the survey team applied the same definition that was used in 2007. There is some evidence of differences in interpretation of questions from an

ECDC survey about partner notification [26], which used the same definitions. Furthermore, whilst the same method to assigned categories of chlamydia control in 2007 and 2012 were used, there are two reasons for non-comparability. First, different people completed the two questionnaires so inter-rater inconsistencies could lead to different categorisations. Second, the online 2012 survey tool presented some questions in a different format and might have resulted in slightly different answers between 2007 and 2012. In order to reduce misclassification, key informants were asked for further explanations about their responses when there were inconsistencies between answers within the 2012 survey and when there were marked conflicts between answers in the 2007 and 2012 surveys.

Interpretation of results

Essential chlamydia prevention and control activities

The infrastructure for chlamydia prevention and control activities in EU/EEA Member States has probably strengthened between 2007 and 2012. A majority of Member States now have at least one set of guidelines for chlamydia case management that addresses case finding through partner notification of diagnosed chlamydia cases and does some primary STI prevention activities. All but two of these countries also have a surveillance system for reporting cases of diagnosed chlamydia infection. These activities broadly correspond with the essential activities in level B of the ECDC guidance on chlamydia control [12]. Some Member States show that they are reinforcing essential activities. Sweden and Denmark are well-resourced countries with strong primary healthcare services and high levels of opportunistic chlamydia testing. Both countries have updated STI prevention strategies since 2007 to emphasise the strengthening of primary prevention and the promotion of safer sexual behaviour, rather than increasing the coverage of opportunistic testing. Several other Member States have yet to elaborate written strategies or plans to support, coordinate and describe the implementation of primary prevention activities [12].

Partner notification for STIs remains a challenging intervention to implement effectively [26]. Evidence from randomised controlled trials shows that partner notification can help prevent repeat infection in the index case and is an efficient way of identifying infected people who need treatment [26,46]. By 2012, many guidelines recommend partner notification, but respondents also said that partner notification is often not done in their country. But qualitative studies show that, whilst people with STIs understand the importance of partner notification, they find it difficult to inform sex partners that they need treatment [26].

More Member States are likely to recommend repeat testing after treatment for chlamydia in future case management guidelines. The incidence of repeated chlamydia infections after treatment is high [17-19,23]. A repeat positive chlamydia test can result from re-infection by an untreated partner (a result of unsuccessful partner notification), new infection from a new partner, antibiotic treatment failure [23], or detection of non-viable DNA/RNA [47]. Repeat testing needs to identify people with chlamydia infection and exclude those with non-viable DNA/RNA, which can persist for several weeks after treatment [47]. Mathematical modelling, informed by data from women in the USA, suggests that the optimal interval for repeat chlamydia testing is three to five months after treatment [48]. Earlier testing may miss women who are exposed to untreated partners but who have not yet become re-infected. But the long-term effects of repeated testing and treatment on chlamydia prevalence and the risk of PID remain unknown. In a cohort study of young women in Indiana, frequently repeated testing and treatment resulted in high and stable levels of chlamydia infection [23].

The interpretation of changes in essential activities over time is based mainly on a comparison of the reported number and content of chlamydia case management guidelines between 2007 and 2012. As acknowledged in the 2007 survey, the survey team does not know either whether guidelines are implemented in practice, or whether practitioners adhere to the recommendations [39]. The results of the 2012 survey gave some insight into the gap between recommendations and implementation. For example, several countries commented that, although partner notification for chlamydia is recommended in case management guidelines, it is often not done (Table 18) or that partner notification practices are weak (Box 1). Similarly, although Member States were asked whether they have written strategy documents, the survey does not reveal whether STI healthcare services and prevention are delivered accordingly.

Opportunistic chlamydia testing and screening programmes

The number of EU/EEA Member States reporting testing for chlamydia of selected groups of asymptomatic individuals increased from eight to 14 between 2007 and 2012. Nine Member States report chlamydia prevention and control activities in levels C or D, indicating that opportunistic chlamydia testing or chlamydia screening programmes are in place. The term opportunistic testing in this survey was used loosely. The term covered groups such as women undergoing abortion, for whom the intention is diagnosis and treatment of infection before a surgical procedure as well as groups such as young adults with no other risk factor for chlamydia who are being offered tests opportunistically. This definition could be refined in future to distinguish groups for which testing is really opportunistic. Experts in several Member States that recommended opportunistic testing remarked that essential case management activities such as partner notification are not well implemented (Box 1). In addition despite recommendations, testing might not be offered or might not be available in practice (Table 10). The limited evidence about the population-level effectiveness of chlamydia screening programmes is reflected in the report from Member States. In 2007, the Netherlands reported starting a pilot programme of systematic yearly invitations to 16 to 29 year old women and men in three regions of the country. In 2012 they reported that they did not introduce a national chlamydia screening programme because the evaluation of the pilot did not find evidence of effectiveness or cost-effectiveness [36]. A study in Ireland showed that an opportunistic chlamydia screening programme, as modelled in this study, would be expensive to implement nationally and unlikely to be judged cost effective by policy makers in Ireland [43]. Additional evidence about the population-level effectiveness of chlamydia screening is awaited. A cluster randomised controlled trial in Australia is investigating the effect of offering regular opportunistic chlamydia screening to women and men aged 16 to 29 years on community level chlamydia prevalence (estimated in attenders at general practice clinics) [49]. The results are expected in 2015 or 2016.

Considerations for programme improvements

- Future reviews of chlamydia prevention and control activities in EU/EEA Member States will continue to use the system of levels A to D for classification. The definitions and content of activities for each level could be clarified for use in future surveys and reports. The planned evaluation of the ECDC guidance document on chlamydia control in Europe provides an opportunity to review the definitions.
- ECDC Guidance level B is suggested as the standard for minimum levels of chlamydia prevention and control in EU/EEA Member States. In the 2012 survey, level B includes:
 - a national strategy or plan for STI prevention and control activities
 - primary STI prevention activities
 - chlamydia case management guidelines that address diagnosis, testing, treatment, partner notification and reporting of cases
 - surveillance of diagnosed chlamydia cases.
- Member States are encouraged to focus on those strategies, plans and activities that help them achieve minimum levels of chlamydia prevention and control before expanding recommendations for opportunistic testing and screening programmes.
- Existing chlamydia case management guidelines, such as the International Union against STI European guidelines [44], or comprehensive guidelines from another country are a possible resource for developing guidelines for local use.
- Clinical audits of practice against agreed standards are a useful method for assessing the implementation of chlamydia case management guidelines. Quality improvement interventions might help to improve adherence to guidelines.

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Glossary of terms used in the questionnaire

Term	Definition
Audit	Sharing information from medical records among a group of peers to assess the quality of patient care against agreed upon standards; the objective is quality improvement [50].
Case finding	Actively seeking those who have been exposed to infection [51], e.g. by offering tests to those who have had sexual contact with a known case (see 'partner notification'), or to those diagnosed with another sexually transmitted infection.
Case management	Care of those with a sexually transmitted infection, including history taking, clinical examination, diagnosis, early and effective treatment, advice on sexual behaviour, promotion of condom use and/or provision of condoms, case reporting, and appropriate clinical follow-up [52].
Clinical practice guidelines	A written set of systematically developed statements to assist practitioners and patients in deciding on appropriate health care for specific clinical conditions [53].
Control of sexually transmitted infections	Deliberate efforts that aim to reduce incidence, prevalence, morbidity or mortality to a locally acceptable level; a reduction maintained by continued intervention measures [54].
Dermatovenereology	Clinical specialty within dermatology that provides care for people with sexually transmitted infections and genital dermatoses.
Genitourinary medicine	Clinical specialty in the UK and Scandinavia that provides care for people with sexually transmitted infections.
Opportunistic chlamydia testing	Offering a chlamydia screening test to individuals who are asymptomatic and attending a health care or outreach setting for any reason [30].
Partner notification	The process by which sex partners of people with sexually transmitted infections are notified of potential exposure to infection; ensures their evaluation and/or treatment, and advises them on preventing future infection [55] (also known as contact tracing). Partner notification is one method of identifying new cases of infection (see 'case finding').
Policy	High-level directives that embody the general goals and acceptable practices of a governmental body. Policies are statements of political will: they establish definite courses of action to guide and determine priorities for present and future decisions, but generally do not have the force of law [38]. National strategies or plans (defined separately) describe the way policy will be implemented.
Primary prevention	Personal and communal efforts to protect health: the task of public health [51]. Its aim is to reduce the number of new cases of illness in a population. In the case of sexually transmitted infections, the population is provided with information and health education, and increased access to condoms.
Primary health care	The first level contact with people who take action to improve health in a community [56].

Public dedicated STI services	Specialist services provided by public health authorities, including clinics designated specifically for patients with sexually transmitted infections. These clinics may be solely for STI patients, or may have facilities designed for patients with STI, while they also serve patients who have other conditions. Clinics with specialist services include dermatovenereology, genitourinary medicine, sexually transmitted diseases, and venereology.
Quality assurance	Organised efforts to ensure that the results of diagnostic tests provided to patients are valid and reliable. Examples of recognised schemes are the United Kingdom National External Quality Assessment Service (UK-NEQAS) and Quality Control for Molecular Diagnostics Providers (QCMD).
Recommendations	See 'guidelines'.
Regulations	Legally binding civil codes that may be issued in conjunction with, or in addition to laws. Regulations can be issued by any number of authorities: governmental, national, ministerial, sub-ministerial, provincial, district, and communal. At the municipal level, regulations are sometimes called ordinances. Regulations and ordinances issued by governmental entities may have the force of law, though enforcement is limited by the level of the issuing authority [38].
Screening	A public health service in which members of a defined population, who do not necessarily perceive that they are at risk of, or are already affected by, a disease or its complications, are asked a question or offered a test to identify those individuals who are more likely to be helped than harmed by further tests or treatment to reduce the risk of disease or its complications [30].
Screening programme	A continuing organised service that screens a high enough proportion of the target population, at sufficiently regular intervals, to benefit the population to a pre-specified degree, while minimising harm [30]. Screening programmes can be systematic (register-based) or opportunistic in their approach to a target group. Nationally managed screening programmes have shared organisational characteristics [40].
Strategy	A set of measures taken by the government to implement a law or policy, or some aspect of a law or policy, and achieve a particular goal. Strategies include milestones, specific objectives or targets by which progress can be measured [38].
Surveillance	On-going systematic collection and analysis of data from a specified population; the results then serve as the basis to determine actions that will prevent and control a disease [57].
TESSy	The European Surveillance System, the ECDC system for collecting, validating, cleaning, analysing and disseminating data on communicable diseases from all EU Member States and EEA countries since 2008 [1]. In addition to routine surveillance, TESSy has replaced the data collection systems in place for the Dedicated Surveillance Networks.

Note: References for definitions used have been given where available. Where no published definition was identified, the project agreed on working definitions and provided them to survey participants.

Appendices

Appendix Table 1. Sections of the questionnaire in 2012

Section 1 – Guidelines for chlamydia diagnosis and case management
Section 2 – Laboratory diagnosis of chlamydia infections
Section 3 – Organisation of chlamydia and STI control at the national level
3.1 Implementation of chlamydia/STI control at the national level
3.2 Payment of patient costs for chlamydia and STI care
3.3 Organisation of STI care
3.4 Guidance document on chlamydia control
Section 4 – Primary prevention for chlamydia and other STI
Section 5 - Surveillance and monitoring of chlamydia tests and diagnoses
5.1 National surveillance and monitoring
5.2 Chlamydia surveillance trend data
5.3 Chlamydia prevalence
Section 6 – Chlamydia screening programmes

Appendix Table 2. Questions used to assess key indicators and self-assessed level of chlamydia prevention and control activities

Indicator	Description	Question(s) in survey
1	The Member State has published a specific strategy or plan on the control of STI, either as a standalone document or as part of an HIV/AIDS/STI control strategy or plan.	12. Does your country have a strategy or plan (see definitions) that describes how your country aims to control STI, other than HIV/AIDS? 12.1. Does the strategy or plan specifically mention control of chlamydia?
2	A strategy or plan addresses sexual health promotion, including the primary prevention of chlamydia.	25. Does your country have a specific strategy or plan addressing sexual health promotion? 25.1 Does this strategy or plan include prevention/ care on STI other than HIV? 25.2 Does this address chlamydia prevention specifically? 26. What chlamydia or STI topics are addressed in the strategy or plan?
3	The Member State has organised activities to improve knowledge, behaviour and awareness of chlamydia prevention, diagnosis and treatment in a) the whole population or b) specific population groups.	27. What activities for prevention of STI, including specific messages for chlamydia control, have been implemented in your country in the last five years? 28. Do these activities include information specifically about chlamydia? 29. For the above-mentioned activities, who is targeted for chlamydia/STI primary prevention activities?
4	The Member State or a professional organisation in the Member State endorses a clinical guideline for case management (including diagnosis and treatment).	43. Does your country have written guidelines or recommendations published about chlamydia diagnosis and case management? For countries with guidelines reported in 2007 survey: Have they been updated since 2007?
5	Case management guidelines explicitly address: a) case finding via partner notification; b) advice or counselling about prevention of future infection.	2.9; 3.9; 4.9; 5.9 and 6.9 (questions addressing guidelines for different medical professionals). Is partner notification recommended? 2.10; 3.10; 4.10; 5.10 and 6.10. Does the guideline suggest specific methods to assist with partner notification? 2.4; 3.4; 4.4; 5.4 and 6.4 (questions addressing guidelines for different medical professionals). Does the guideline cover: who to test; diagnostic tests; antibiotic treatment; partner management; follow up; reporting of cases; counselling?
6	Asymptomatic people from: a) specific high-risk groups; or b) larger groups in the population are offered chlamydia testing opportunistically.	2.6; 3.6; 4.6; 5.6 and 6.6. If the guideline specifies who should be tested does this include groups of people with no specific symptoms or signs, i.e. asymptomatic (this includes groups for whom screening is recommended? 2.6.1; 3.6.1; 4.6.1; 5.6.1 and 6.6.1. Which groups of asymptomatic patients? 14.3. Opportunistic screening of asymptomatic individuals from specific groups at risk of chlamydia in my country is: standard practice; available, but limited; infrequent and difficult to access; not done. Explain in more detail.
7	A national or regional programme that offers screening to a substantial part of the target population is in place or in preparation.	14.4 An organised chlamydia screening programme in my country is: well-established and implemented; done, but not implemented in an organised programme; planned/in development; not done 57. Does your country have an organised chlamydia screening programme? 58. Does your country have plans to introduce or pilot an organised chlamydia screening programme?

8	Healthcare services that diagnose and treat people with STI symptoms are accessible within the general health system or in specialised STI clinics.	2.5; 3.5; 4.5; 5.5 and 6.5. If the guideline specifies who should be tested, does this include groups of patients with specific symptoms or signs? 2.5.1; 3.5.1; 4.5.1; 5.5.1 and 6.5.1. Which groups of symptomatic patients? 17. Does your country have public dedicated services for diagnosis and treatment of chlamydia and other STI? 17.1. What clinical specialty provides these services? 17.2. Where are the clinics located? 17.3. How many clinics are there in total? 18. Apart from public dedicated services, are there alternative providers of care for STI patients? 18.1. To which settings could someone go for a chlamydia test?
9	Laboratories use reliable diagnostic tests for chlamydia.	7. Are NAATs for chlamydia available in your country? 7.1. in the public or the private health sector? 7.2. What percentage of tests was done by NAAT last year?
10	Laboratories take part in a recognised quality assurance programme	11. Does your country have a national quality assurance programme for chlamydia diagnostics? 11.1. Did laboratories in your country take part in an international quality assurance programme such as QCMD or UK-NEQAS in 2011?
11	Surveillance of chlamydia cases is in place and trends in specific groups are analysed.	30. How are surveillance and monitoring of chlamydia diagnoses carried out in your country?
12	Surveillance of chlamydia testing is done and high and lower risk groups are covered.	43.2. Are high-risk groups over-represented in the surveillance?
13	Data about trends in the occurrence of complications from chlamydia, such as PID, ectopic pregnancy and infertility are monitored.	39/40. Does your country collect/report data on clinical complications that can be caused by chlamydia?
D	Corresponds with assigned category 5, with the addition of primary prevention activities.	13a. We have an organised programme that offers regular chlamydia screening to asymptomatic individuals in a well-defined target population. People found to be infected are managed according to guidelines for treatment and partner notification services. We have primary prevention activities as well.
C	Corresponds with assigned category 4, with the addition of primary prevention activities.	13b. We have guidelines for offering opportunistic screening to specific groups of asymptomatic people at risk of chlamydia when they attend healthcare or outreach settings. People found to be infected are managed according to guidelines for treatment and partner notification services. We have primary prevention activities as well.
B	In this category, having partner notification included in guidelines was not essential. This corresponds with assigned categories 2 and 3, with the addition of primary prevention activities.	13c. We have nationally recommended guidelines for managing people with diagnosed chlamydia; the guidelines include some or all of the following: diagnostic methods, antibiotic treatment, partner management, case reporting. We have primary prevention activities as well.
A	In this category, primary prevention activities did not have to be implemented according to a national strategy of plan for STI control.	13d. We only have activities for primary prevention of STI in general, including some or all of the following: health promotion, health education, sex and relationships education in schools, condom promotion and distribution.
Unclear	Does not fit any category	13e, 13.1. My country doesn't fit any of the categories above. Our chlamydia control activities are as described below:...

Appendix Table 3. Documents sent by survey respondents with the questionnaire, by country and topic

Belgium	
Test guideline	Service des soins de santé de l'INAMI (Dienst voor geneeskundige verzorging) (june 2011) Biologie Clinique – Prescription rationnelle Klinische biologie – Rationeel voorschrijven van testen). J. De Cock, Brussels. [Document in French or Dutch]
Surveillance Report	Verbrugge R., Sasse A (November 2012). Surveillance des Infections Sexuellement Transmissibles au sein de la population générale en Belgique et dans les Régions [Surveillance van Seksueel Overdraagbare Aandoeningen bij de algemene bevolking in België en de Regio's]. Internal reference number: 2012/30. Santé publique & Surveillance (Volksgezondheid & Surveillance), Brussels, Belgium [Document in French or Dutch]
Guideline Antenatal care	LODEWYCKX K, PEETERS G., SPITZ B., BLOT S., TEMMERMAN M., ZHANG W., ALEXANDER S., MAMBOURG F., RAMAEKERS D (2004). Recommandation nationale relative aux soins prénatals (Nationale richtlijn prenatale zorg). KCE reports vol. 6A/B. Centre fédéral d'Expertise des soins de santé (Federaal Kenniscentrum voor de Gezondheidszorg), Brussels, Belgium. [Document in French or Dutch]
Estonia	
Surveillance	www.terviseamet.ee; http://pxweb.tai.ee/esf/pxweb2008/Database_en/Morbidity/02Communicable%20diseases/02Communicable%20diseases.asp ; http://www.terviseamet.ee/fileadmin/dok/Kasulikku/Nakkushaigused/stat_15.pdf
Finland	
STI guideline	Käypä hoito –suositus (2010) Suomalaisen Lääkäriseuran Duodecimin ja Sukupuolitautien Vastustamisyhdistys ry:n asettama työyhmä. [Document in Finnish]
Sexual health promotion	Sosiaali- ja terveystieteiden tutkimuskeskuksen julkaisu 2007:17 Seksuaali- ja lisääntymisterveyden edistäminen. Toimintaohjelma 2007–2011 [Document in Finnish]
Infectious Disease Surveillance	Jaakola Sari, Lyytikäinen Outi, Rimhanen-Finne Ruska, et al. INFECTIOUS DISEASES IN FINLAND 2011. National Institute for Health and Welfare (THL) Department of Infectious Disease Surveillance and Control, Helsinki, Finland
France	
Strategy or plan	Ministere de la Sante et des Sports. PLAN NATIONAL DE LUTTE CONTRE LE VIH/SIDA ET LES IST 2010-2014
Treatment guideline	Agence française de sécurité sanitaire des produits de santé (2008). Traitement antibiotique probabiliste des urétrites et 46ocus46itis non compliquées.
Surveillance	http://opac.invs.sante.fr/doc_num.php?explnum_id=7154
Iceland	
Surveillance	http://www.landlaeknir.is/smit-og-sottvarnir/smitsjukdomar/tilkynningarskyldir-sjukdomar/
Ireland	
Policy	Royal College of Physicians of Ireland (2011) Submission of the RCPI Policy Group on Sexual Health to 'Your Health is Your Wealth: a Policy Framework for a Healthier Ireland 2012 – 2020'.
Surveillance	http://www.hpsc.ie/hpsc/A-Z/HIVSTIs/SexuallyTransmittedInfections/Publications/STIAnnualandQuarterlyReports/2011/ and STIAnnualandQuarterlyReports/2012/
Italy	
Surveillance	http://www.iss.it/binary/ccoa/cont/Notiziario_Istituto_Superiore_di_Sanit_2012.pdf_25_10_7_11.pdf ; and Notiziario_Istituto_Superiore_di_Sanit_2012.pdf_25_2_pp.3_10.pdf
Latvia	
STI guidelines	Dzimumorganu Infektiju Diagnostika Arstesana – Nacionalas vadlinijas. Riga 2002
Surveillance	http://www.spkc.gov.lv/seksuali-transmisivo-infekcijas-slimibu-statistika/
Liechtenstein	
Strategy or plan	Nationales Programm HIV und andere sexuell übertragbare Infektionen (NPHS) 2011–2017. Bundesamt für Gesundheit (Switzerland). http://www.bag.admin.ch/hiv_aids/05464/05465/12491/index.html?lang=de
STI guideline	Empfehlungen zur frühzeitigen Behandlung von sexuell übertragbaren Infektionen (STI) durch erstbehandelnde Ärztinnen und Ärzte: Klinisches Vorgehen bei Beschwerden im Genitalbereich. Arbeitsgruppe «Sexuell übertragbare Infektionen», im Auftrag des Bundesamtes für Gesundheit.
Lithuania	
Strategy or plan	VALSTYBINĖ ŽIV/AIDS IR LYTIŠKAI PLINTANČIŲ INFEKCIJŲ PROFILAKTIKOS IR KONTROLĖS 2010–2012 METŲ PROGRAMA. 2010
Health education policy	DĖL RENGIMO ŠEIMAI IR LYTIŠKUMO UGDYMO PROGRAMOS PATVIRTINIMO. 2007
Surveillance	http://www.ulac.lt/uploads/downloads/leidiniai/lpi_2011.pdf

Malta	
Policy	National Sexual health Policy for the Maltese Islands (2010) Ministry for Health, the Elderly and Community Care, Malta
Surveillance	ANNUAL NOTIFIABLE INFECTIOUS DISEASES REPORT (2011) Department for Health Promotion and Disease Prevention, Malta
Netherlands	
Surveillance	Sexually transmitted infections, including HIV in The Netherlands (2012). http://www.rivm.nl/Documenten_en_publicaties/Wetenschappelijk/Rapporten/2013/juni/Sexually_transmitted_infections_including_HIV_in_the_Netherlands_in_2012
Norway	
Surveillance	http://www.fhi.no/eway/default.aspx?pid=233&trq=MainLeft_5588&MainArea_5661=5588:0:15,1787:1:0:0:::0:0&MainLeft_5588=5544:97734:::1:5694:52:::0:0&4509=5694:2
Spain	
Surveillance	Área de vigilancia del VIH y conductas de riesgo. Vigilancia epidemiológica de las infecciones de transmisión sexual, 1995-2010. Madrid : Centro Nacional de Epidemiología ; 2012
Guideline	Grupo de trabajo sobre ITS. Infecciones de transmisión sexual : Diagnóstico, tratamiento, prevención y control. Madrid, 2011
Guideline GP	Guia de buena practica clinica en infecciones de transmision sexual. Organizacion medical collegial, Madrid.
Sweden	
Strategy or plan	Regeringens proposition 2005/06:60 Nationell strategi mot hiv/aids och vissa andra smittsamma sjukdomar (2006). http://www.regeringen.se/sb/d/108/a/55679
Strategy or plan Prevention	Nationell handlingsplan för klamydiaprevention Med 47ocus på ungdomar och unga vuxna 2009–2014 (2009)
Guidelines	Genital klamydiainfektion inklusive Lymfogranuloma venereum (LGV). Lars Falk 2012
Surveillance	EPIDEMIOLOGISK ÅRSRAPPORT (2011). Smittskyddsinstitutet, Stockholm. http://www.smittskyddsinstitutet.se/upload/Publikationer/Epidemiologisk-arsrapport-2012-15-6.pdf
Slovakia	
	http://www.uvzsr.sk/docs/vs/vyrocn_a_sprava_SR_11.pdf
Slovenia	
	http://www.ivz.si/hiv_spo?pi=5&_5_FileName=5502.pdf&_5_MediaId=5502&_5_AutoResize=false&pl=107-5.3
UK	
Strategy or plan	Better prevention, Better services, Better sexual health. The national strategy for sexual health and HIV (2001). Department of Health.
Strategy or plan	The Sexual Health and Blood Borne Virus Framework 2011-2015 (Scotland).
Guidelines	BASHH (2006) UK National Guideline for the Management of Genital Tract Infection with Chlamydia trachomatis
Guidelines	BASHH Statement on Partner Notification for Sexually Transmissible Infections (2012)
Guideline GP	http://www.rcgp.org.uk/news/2013/april/~/_media/Files/CIRC/RCGP-Sexually-Transmitted-Infections-in-Primary-Care-2013.ashx
Guidelines	SIGN: Management of genital Chlamydia trachomatis infection, March 2009 (Scotland)
Screening Programme	National Chlamydia Screening Programme Standards (6 th Edition). 2012. http://www.chlamydia-screening.nhs.uk/ps/

Documents relating to policies, strategies or plans are described with the wording of the original document. If this is not clear, they are described using the wording of the questionnaire as 'strategy or plan'.

Appendix Table 4. Overview of primary prevention strategy, activities and target groups

	Primary prevention strategy (or Sexual Health Strategy)	Strategy addresses:				
		Chlamydia specifically	Access to reliable information on STI prevention is regarded as a public right	Prevention of sexual risk behaviour; condom promotion	Importance of (regular) testing for Chlamydia/STI	Access to sexual health - and STI care
Austria	No					
Belgium	Yes	Yes	Yes	Yes	Yes	Yes
Bulgaria	Yes, integrated in STI control	No	No	Yes	No	Yes
Cyprus	Not yet, in development	No	Yes	Yes	No	No
Czech Republic	Yes	Yes	Yes	Yes	No	No
Denmark	Yes	Yes	No	Yes	No	No
Estonia	No					
Finland	Yes	Yes	Yes	Yes	Yes	Yes
France	Yes	Yes	Yes	Yes	Yes	No
Germany	No					
Hungary	No					
Iceland	No					
Ireland	Not yet, in development					
Italy	No					
Latvia	No					
Liechtenstein	Yes, uses strategy Switzerland	No	Yes	Yes	Yes	Yes
Lithuania	Yes	No	Yes	Yes	No	No
Malta	Yes	No	Yes	Yes	Yes	Yes
Netherlands	Yes	Yes	Yes	Yes	Yes	Yes
Norway	Yes	Yes	Yes	Yes	Yes	Yes
Portugal	No					
Romania	Yes, integrated in Reproductive Health Strategy	No	No	Yes	No	Yes
Slovakia	Yes, integrated in Public Health Strategy	No	Yes	No	No	Yes
Slovenia	No					
Spain	No					
Sweden	Yes	Yes	Yes	Yes	Yes	Yes
UK	Yes	Yes	Yes	Yes	Yes	Yes

Greece, Luxembourg, Poland: data not available

Appendix Table 4: continued

	Prevention activities								
	No activities reported	Awareness campaigns via public media as routine, repeated activities	Awareness campaign(s) via public media as incidental, singular activity(ies)	Awareness and information campaign(s) via social media	Local or regional campaign(s)	Sexual health and STI prevention as a standard part of school education	Sexual health and STI prevention as an optional part of school education	Promotion of condoms	STI prevention activities are Chlamydia specific
Austria	X								
Belgium			Yes	Yes	Yes		Yes	Yes	All
Bulgaria			Yes		Yes	Yes	Yes	Yes	Some
Cyprus						Yes			All
Czech Republic	X								
Denmark		Yes		Yes	Yes		Yes	Yes	All
Estonia								Yes	Some
Finland					Yes	Yes		Yes	Some
France			Yes	Yes	Yes			Yes	Some
Germany		Yes		Yes		Yes			No
Hungary	X								
Iceland						Yes	Yes		Some
Ireland			Yes	Yes		Yes	Yes	Yes	Some
Italy					Yes		Yes		No
Latvia				Yes	Yes				Some
Liechtenstein			Yes			Yes			Some
Lithuania		Yes		Yes			Yes		No
Malta		Yes	Yes	Yes		Yes	Yes	Yes	Some
Netherlands		Yes	Yes	Yes	Yes		Yes	Yes	Some
Norway				Yes	Yes	Yes		Yes	Some
Portugal									No, hardly
Romania	X								
Slovakia							Yes		Some
Slovenia		Yes		Yes			Yes	Yes	Some
Spain			Yes		Yes				No
Sweden			Yes	Yes	Yes	Yes		Yes	Some
UK			Yes	Yes	Yes	Yes	Yes	Yes	Some

Greece, Luxembourg, Poland: data not available

Appendix Table 4: continued

	Target groups for prevention activities						
	Primary school population (6-12 years old)	Secondary school population (12-16 years old)	Students in professional education, vocational schools (16+)	Young people (<25 years old)	MSM	Specific ethnic groups	Commercial Sex Workers
Austria*							
Belgium		Yes	Yes	Yes	Yes		
Bulgaria		Yes	Yes	Yes	Yes	Yes	
Cyprus		Yes					
Czech Republic*							
Denmark				Yes			
Estonia				Yes			
Finland		Yes	Yes	Yes			
France				Yes			
Germany		Yes		Yes			
Hungary*							
Iceland		Yes	Yes	Yes	Yes		
Ireland	Yes	Yes		Yes	Yes		
Italy		Yes	Yes				
Latvia							
Liechtenstein					Yes	Yes	
Lithuania		Yes		Yes			
Malta		Yes	Yes	Yes			
Netherlands		Yes	Yes	Yes	Yes	Yes	Yes
Norway	Yes	Yes	Yes	Yes	Yes		
Portugal							
Romania*							
Slovakia			Yes				
Slovenia	Yes	Yes	Yes		Yes		
Spain				Yes	Yes		
Sweden	Yes	Yes	Yes	Yes	Yes		
UK		Yes	Yes	Yes	Yes	Yes	

Greece, Luxembourg, Poland: data not available; * no prevention activities reported; Latvia and Portugal reported no specific target groups

Appendix Table 5. Chlamydia case management guidelines available, by country

Country	All healthcare providers	General practice	Dermato-venereology/GU M clinics	Gynaecology/antenatal	Other profession
Austria	new	new	updated	new	
Belgium	updated				
Bulgaria	new	new	new	new	other
Cyprus					other
Czech Republic	updated	updated			Infectious disease practitioners
Denmark	new				
Estonia	updated				
Finland	new	new	new	new	
France	new				
Germany				updated	urology
Hungary					
Iceland		new		new	
Ireland					
Italy	new			new	
Latvia					
Liechtenstein*	new	new	new	new	other
Lithuania					
Luxembourg					
Malta					
Netherlands			updated	updated	Municipal Health Services
Norway	updated	new	new	new	
Portugal					
Romania	updated		new		
Slovakia					
Slovenia					
Spain	new	new			
Sweden	updated	updated	updated	updated	other
UK	updated†	updated			NCSP‡

The Member State has guideline

The Member State didn't report guideline

* Liechtenstein uses guidelines from Switzerland; † UK guideline for all healthcare practitioners is for Scotland only;

‡ NCSP, National Chlamydia Screening Programme in England; standards apply to all providers offering asymptomatic chlamydia testing to <25 year olds.

Appendix Table 6. An overview of the partner notification recommendations per guideline per country; inclusion in case management guidelines and methodology recommended

	Guidelines per professional group:				
	All healthcare providers	General practice	Dermato-venereology/ GUM clinics	Gynaecology/ antenatal clinic	Other profession
Partner notification recommended in one or more guideline(s) (19 countries)					
Austria	No methods specified	No methods specified	No methods specified	No methods specified	
Bulgaria	PDPT, patient referral	PDPT, patient referral	PDPT, patient referral	PDPT, patient referral	PDPT, patient referral
Czech Republic	No methods specified	No methods specified	patient referral	No information	NI
Denmark	No methods specified	No methods specified			
Estonia	No methods specified				
Finland	<i>PDPT, provider referral, patient referral</i>	<i>PDPT, provider referral, patient referral</i>	<i>PDPT, provider referral, patient referral</i>	No methods specified	
France	No methods specified		patient referral		
Germany				NI	No methods specified
Hungary	<i>Provider referral</i>				
Iceland	<i>Provider referral Other*</i>	<i>No methods specified</i>		No information	
Latvia			<i>No methods specified</i>	<i>No methods specified</i>	
Liechtenstein	No methods specified	No methods specified	No methods specified	No methods specified	No methods specified
Lithuania	<i>No methods specified</i>				
Netherlands		Patient referral	Provider referral, patient referral, (pilot) internet PN	No methods specified	Provider referral, patient referral
Norway	<i>PDPT, Home sampling kit, Provider referral, Patient referral</i>	<i>No methods specified</i>	<i>No methods specified</i>	NI	
Romania	Patient referral		No methods specified		
Spain	Patient referral	Patient referral			
Sweden[‡]	<i>PN guidelines</i>	<i>PN guidelines</i>	<i>PN guidelines</i>	<i>PN guidelines</i>	<i>PN guidelines</i>
UK	<i>PN guidelines[§]</i>	PN via provider referral, patient referral	PN guidelines		PN via provider referral, patient referral
Partner notification is not included in any of the existing guideline(s) (n=3)					
Belgium	NI			NI	
Cyprus	NI	NI	NI	NI	NI
Italy	NI		NI	NI	
No case management guidelines (n=6)					
Ireland	No case management guidelines				
Luxembourg	No case management guidelines				

Malta	No case management guidelines
Portugal	No case management guidelines
Slovakia	No case management guidelines
Slovenia	No case management guidelines

NI, partner notification not included in guideline recommendations; PN, partner notification; PDPT, patient delivered partner therapy;

*Countries in **bold** are those in which partner notification is recommended;*

Countries in italics are those in which it is considered mandatory;

** The patient can decide who contacts the partners, the patient himself or the practitioner. The practitioner can refer the patient for partner notification to the STI clinic and partner notification can be done anonymously;*

‡ In Sweden, the guideline refers to specific partner notification guidelines;

§ In Scotland only

Appendix Table 7. Coverage of costs for chlamydia case management

Country	Consultations	Tests	Treatment	PN/partner treatment
Austria	completely	completely	completely	completely
Belgium	partially	partially	partially	partially
Bulgaria	no	no	no	no
Cyprus	partially	partially	partially	partially
Czech Republic	completely	completely	partially	completely
Denmark	completely	completely	no	no
Estonia	completely	completely	partially	no
Finland	completely	completely	completely	completely
France	partially	partially	partially	partially
Germany	completely	partially	partially	no
Hungary	completely	completely	completely	completely
Iceland	completely	completely	completely	completely
Ireland	partially	partially	partially	partially
Italy	partially	partially	partially	partially
Latvia	no	no	no	no
Liechtenstein	completely	completely	completely	completely
Lithuania	completely	no	partially	completely
Luxembourg	partially	completely	partially	no
Malta	completely	completely	no	no
Netherlands	completely	completely*	completely*	completely
Norway	completely	completely	completely	completely
Portugal	partially	partially	partially	no
Romania	partially	no	no	no
Slovakia	completely	completely	no	partially
Slovenia	completely	completely	completely	completely
Spain	completely	completely	partially	partially
Sweden	completely	completely	completely	completely
UK	completely	completely	completely	completely

PN, partner notification;

* In the Netherlands, testing and treatment are free for risk groups at STI centres. At general practitioners the patients have to pay through their health insurance

Appendix Table 8. Most common provider of chlamydia testing, availability of chlamydia case management guidelines, PN recommendations and surveillance/monitoring information collection from the specific settings

Country	Most common provider	Guidelines available	Recommendations about PN	Included in surveillance
Austria	STI/GUM, Gynae/ANC	Yes Yes	No methods specified No methods specified	No No
Belgium	STI/GUM, Gynae/ANC Family planning Medical student centres	No* Yes No* No*	Not recommended	Yes Yes Yes Yes
Bulgaria	STI/GUM	Yes	Specific methods	Yes
Cyprus	Gynae/ANC	Yes	No methods specified	Yes
Czech Republic	STI/GUM	Yes	Specific methods	No
Denmark	GP	Yes	No methods specified	Yes
Estonia	Gynae/ANC	No*		Yes
Finland	GP	Yes	Specific methods	Yes
France†	Gynae/ANC	No*		No
Germany	Gynae/ANC	Yes	Not recommended	Yes
Hungary	STI/GUM	Yes	Specific methods	Yes
Iceland	GP	Yes	No methods specified	Yes
Ireland††	STI/GUM	No		Yes
Italy	STI/GUM, Gynae/ANC	Yes Yes	Not recommended Not recommended	Yes No
Latvia	STI/GUM, Gynae/ANC Urologist	Yes Yes No	No methods specified No methods specified	Yes Yes No
Liechtenstein	Gynae/ANC, Urologist	Yes No	No methods specified	Yes Yes
Lithuania	STI/GUM, Gynae/ANC, Urologist	No* No* No*		Yes Yes Yes
Luxembourg	Family planning	No		Yes
Malta	STI/GUM	No		Yes
Netherlands	GP	Yes	Specific methods	Yes
Norway	GP	Yes	No methods specified	No
Portugal	STI/GUM	No		No
Romania	STI/GUM, Gynae/ANC Urologist	Yes No* No*	No methods specified	No No No
Slovakia	STI/GUM, Gynae/ANC Urologist	No No No		Yes Yes No
Slovenia	STI/GUM	No		Yes
Spain†	GP, STI/GUM	Yes No*	Specific methods	No No
Sweden	STI/GUM	Yes	Specific methods	Yes
UK	STI/GUM	Yes		Yes

GP, general practitioner; GUM, genitourinary medicine; Gynae/ANC, gynaecology or antenatal clinics; PN, partner notification;

* No specific guidelines for the most common provider, but guidelines for all health care providers are available;

† A guideline for another specific health care setting is available.

†† No national guidelines in Ireland, STI/GUM clinicians tend to follow British Association for Sexual Health & HIV (BASHH) guidelines