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Primary care integration of sexual and reproductive health services for chlamydia testing across WHO-Europe: a systematic review

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ABSTRACT

Objective To identify current uptake of chlamydia testing (UCT) as a sexual and reproductive health service (SRHS) integrated in primary care settings of the WHO European region, with the aim to shape policy and quality of care.

Design Systematic review for studies published from January 2001 to May 2018 in any European language.

Data sources OVID Medline, EMBASE, Maternal and Infant Care and Global Health.

Eligibility criteria Published studies, which involved women or men, adolescents or adults, reporting a UCT indicator in a primary care within a WHO European region country. Study designs considered were: randomised control trials (RCTs), quasi-experimental, observational (eg, cohort, case–control, cross-sectional) and mixed-methods studies as well as case reports.

Data extraction and synthesis Two independent reviewers screened the sources and validated the selection process. The BRIGGS Critical Appraisal Checklist for Analytical Cross-Sectional Studies, the Mixed Methods Appraisal Tool 2011 and Critical Appraisal Skills Programme (CASP) checklists were considered for quality and risk of bias assessment.

Results 24 studies were finally included, of which 15 were cross-sectional, 4 cohort, 2 RCTs, 2 case–control studies and 1 mixed-methods study. A majority of the evidence cites the UK model, followed by the Netherlands, Denmark, Norway and Belgium only. Acceptability if offered test in primary healthcare (PHC) ranged from 55% to 81.4% in women and from 9.5% to 70.6% when both genders were reported together. Men may have a lower UCT compared with women. When both genders were reported together, the lowest acceptability was 9.5% in the Netherlands. Denmark presented the highest percentage of eligible people who tested in a PHC setting (87.3%).

Conclusions Different health systems may influence UCT in PHC. The regional use of a common testing rate indicator is suggested to homogenise reporting. There is very little evidence on integration of SRHS such as chlamydia testing in PHC and there are gaps between European countries.

Strengths and limitations of this study

- ► This literature review, unlike previous attempts, is exclusive to the European region.
- ► The search was exhaustive as it included the 53 countries belonging to WHO European region and all European languages.
- ► 48 of 53 countries may not show data due to a diversity of research and health system particularities of the states.
- ► Grey literature was not considered.

INTRODUCTION

Rationale

In 1978, the Alma-Ata Declaration positioned primary healthcare (PHC) as 'the key to the attainment of the goal of 'Health for All".[1] Sixteen years later, the 1994 International Conference on Population and Development encouraged the provision of sexual and reproductive health services (SRHS) in an integrated way within the primary care health system.[2] By the early 2000s, the WHO further recommended integrating other health services, like SRHS with primary care.[3] At the 60th UN General Assembly in 2005 a message was sent that in order to achieve universal access to reproductive health by 2015, SRHS were to be delivered through PHC.[1] Five years later, a meeting held in Ankara reinforced this message to the European countries.[4] Most recently in 2018, the Astana Declaration emphasised the critical role of PHC around the world, to ensure that everyone is able to enjoy the highest possible attainable standard of health. Today, PHC needs to increase its responsive capacity and to standardise such integrated delivery of SRHS.[2] Currently, the UN Sustainable Development Goals #3 (good health/well-being) and #5 (gender equality) require that safe and essential SRHS are accessible to all. Evidence on how this has been achieved in the European region (understood as the 53 countries integrating the WHO European region) is

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limited, particularly regarding chlamydia testing. With the exception of the UK, very few European countries have taken action.

Ideally, according to the WHO, SRHS programmes must serve all segments of the population and yet contain different components to serve five specialty areas: (1) maternal and new-born health; (2) family planning; (3) prevention of unsafe abortion; (4) management of reproductive tract infections and sexually transmitted infections (STIs), including HIV/AIDS and (5) promotion of sexual health.[2] This research focusses on the fourth area, STIs, specifically chlamydia infection testing. Chlamydia is the most commonly STI in Europe, with most of the cases being asymptomatic but leading to complications such as pelvic inflammatory disease and infertility.[5]

The integration of chlamydia testing can be at three different levels: at the point of service delivery (POSD), at the health sector level and within national development planning processes.[2] In this sense, the present analysis will concentrate on exploring the integration at the POSD (uptake).

Previous systematic reviews focussed on low-income and middle-income countries (mostly in Africa) and did not analyse Europe as a region or did not emphasise the primary care settings. In 2013, Jamil *et al* reviewed chlamydia testing strategies and outcomes but only in home-based programmes in the United States/Canada, Europe, Australia/New Zealand and Asia from 2005 to 2011.[5] In 2015, Crichton *et al* published a systematic review on chlamydia prevalence derived from population-based samples from testing that included young people aged 15–24 years from Europe, North America or Australia.[6] The Crichton's review focussed on providing evidence of a consistent association between socioeconomic disadvantages and the higher risk of chlamydia infection.[6] The same year Phillipson *et al* appraised the effectiveness of chlamydia testing interventions from 2002 and 2012 in Australia and Europe (including the UK), targeting young adults in community-based settings, describing the strategies used and assessing them according to social marketing benchmark criteria.[7] Today, our systematic review will add a regional panorama, focused on primary care settings point of service delivery uptake of this particular intervention and with the aim to shape policy and quality of care.

For the purpose of our research, we define primary care as a component of PHC, referring to the first level of contact people have with healthcare teams.[1] In the current study, primary care venues considered were: general practitioner (GP), family medicine or general medicine clinics. We recognise that SRHS are 'integrated', when the practices provide specialised services such as chlamydia testing within the PHC setting and that HIV screening, abortion procedures and contraceptive methods are also part of the SRHS but will not be the focus of the research. Nevertheless, they could be indicators of integration.

Objectives

To identify the current uptake of chlamydia testing (UCT) as an SRHS integrated in primary care settings of the WHO European region. Findings will shape further policy, detect gaps in research and identify variation in practice between countries.

Research question

The academic query that guided this research was:

> What is the uptake of chlamydia testing among adolescent and adult population, in primary care settings across the WHO European region?

METHODS

Literature search

The study design is a systematic review of the literature. A two-step search strategy was used:

1. Initial search through MEDLINE followed by analysis of the text words contained in the title and abstract and of the index terms used to describe an article.
2. Search using all identified keywords and index terms was then undertaken across the included electronic databases (OVID Medline, EMBASE, Maternal and Infant Care, Global Health).

A list of search terms can be found in online supplementary appendix A.

Inclusion criteria

To ensure a systematic and structured analysis, we adopted the PICOS framework that is used to answer clinical or health related questions. The P stands for patient, problem or population; I: intervention; C: comparison; O: outcome and S: study design. Using 'population' for P, the PICOS criteria for this research are as follows:

P: Female and male, adolescent or adult patients (more than or equal to 12 years old) from countries within the WHO European region.

I: Chlamydia testing in primary care settings (GP or family medicine practices).

C: Differences in uptake and model between countries.

O: PHC POSD uptake (see indicators below).

S: Cohort, case–controls, cross-sectional studies or case reports.

The study outcome indicators on the UCT were:

- The percentage of acceptability if offered testing in PHC (eg, if the GP invites a patient to undertake a chlamydia test and they attend).
- The percentage of patients tested in PHC (coverage) (eg, of the population studied, the percentage of those tested in PHC instead of other venues, for example, a sexual health clinic);
- The percentage of high-risk patients getting tested in PHC (eg, high-risk individuals, for example, sex workers, tested in a PHC venue recognised in this study).

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- The percentage of "x" gender tests (men or women or both) performed in PHC, (eg, of all tests done for women in the population studied, the proportion of those made in PHC).
- The percentage of tests in PHC that were performed on "x" gender (men or women or both), (eg, of all tests done in PHC in a Danish province, the proportion of tests performed in men).
- The percentage of PHC patients requesting chlamydia testing when consulted for STI (eg, of all the patients in a PHC clinic that consult for an STI, the percentage who ask for chlamydia testing).
- The percentage of patients in PHC who get tested (eg, of all the patients in a PHC clinic, the percentage who received chlamydia testing).

Data extraction

The selected studies were stored and processed on ENDNOTE7. Quantitative data were extracted in a Microsoft Word table, including: country (setting), year, author, study type, uptake (men, women and both), positivity/prevalence and age. Author email contact was considered if any data confirmation was required from investigators.

Quality assessment

Two independent reviewers screened the sources and validated the selection process. The Joanna Briggs Institute's Critical Appraisal Checklist for Analytical Cross-Sectional Studies (BRIGGS), the Mixed Methods Appraisal Tool (MMAT) 2011 and Critical Appraisal Skills Programme (CASP) checklists were considered for quality and risk of bias appraisal (see table 1).

Patient and public involvement

No patient involved.

Table 1 Quality appraisal summary

Year	Author	Study type	Score
2001	Johansen *et al*[12]	Cross-sectional	5/8 (BRIGGS)
2003	Kufeji *et al*[20]	Cross-sectional	6/8 (BRIGGS)
2003	Pimenta *et al*[21]	Mixed methods	12/13 (MMAT)
2004	Strand *et al*[22]	Cohort	10.5/12 (CASP)
2004	Verhoeven *et al*[10]	Cross-sectional	6/8 (BRIGGS)
2005	McCadden *et al*[23]	Cross-sectional	6/8 (BRIGGS)
2005	Andersen *et al*[24]	Case–control	10.5/11 (CASP)
2005	Harris[25]	Cohort	10/12 (CASP)
2005	Senok *et al*[8]	RCT	11/11 (CASP)
2007	Hughes *et al*[26]	Cross-sectional	6/8 (BRIGGS)
2008	Neale *et al*[27]	Cross-sectional	6/8 (BRIGGS)
2008	Sohal *et al*[28]	Cross-sectional	5/8 (BRIGGS)
2009	Creighton[29]	Cross-sectional	5/8 (BRIGGS)
2010	Sadler *et al*[30]	Cross-sectional	7/8 (BRIGGS)
2012	Woodhall *et al*[31]	Cross-sectional	6/8 (BRIGGS)
2012	Van den Broek *et al*[9]	RCT	11/11 (CASP)
2012	Saunders *et al*[32]	Cross-sectional	8/8 (BRIGGS)
2013	Trienekens *et al*[33]	Cohort	10.5/12 (CASP)
2014	Van Liere *et al*[34]	Cross-sectional	8/8 (BRIGGS)
2014	Kelly[35]	Cohort	10/12 (CASP)
2014	Pedersen[36]	Case–control	11/11 (CASP)
2015	Buijs[37]	Cross-sectional	5/8 (BRIGGS)
2016	Clifton *et al*[38]	Cross-sectional	7/8 (BRIGGS)
2017	Romoren[39]	Cross-sectional	6/8 (BRIGGS)

CASP, Critical Appraisal Skills Programme ; MMAT, Mixed Methods Appraisal Tool; RCT, randomised control trial.

RESULTS

The flow diagram of the studies retrieved for the review is shown in figure 1. In total, 24 studies were finally included in the analysis, of which 15 were cross-sectional studies, 4 cohort studies, 2 randomised control trials (RCTs), 2 case–control studies and 1 mixed-methods study. Table 1 shows the individual tool assessment results for each of the included studies. No serious risk of bias or quality was detected. Of the 53 countries of the WHO European region and that were included in the search strategy, only 5 showed results. The majority of studies originated from the UK (14) followed by the Netherlands (4) Denmark (3) Norway (2)[2] and Belgium (1). The population reported has a minimum age of 12 years and a maximum age of 70 years. In most studies, those tested ranged between 16 and 25 years old.

RCT interventions included two different population screening strategies: The UK general practice[8] and a register-based, yearly chlamydia screening in three regions of the Netherlands: Amsterdam, Rotterdam and South Limburg.[9] In general, the studies' objectives inclined towards effectiveness evaluations. Under the 'effectiveness' tag, uptake indicators were measured. The geographical location of the studies can be consulted in table 2.

Uptake data were defined through different indicators as seen in table 3. Acceptability stands for the percentage of people who take the test after it has been offered. The ranges on the table outline the minimum and maximum values reported in the countries analysed, giving a regional value. Values that were reported by only one country have it specified in parenthesis.

The results (table 3) indicate that men may have a lower uptake rate than women. The highest acceptability in women was 81.4% against 29.4% in men. When genders were combined, the lowest acceptability rate reported was 9.5% in the Netherlands. The percentage of women who got tested in PHC varies from 27% to 50%, contrasting the range of 6%–17.1% among men. Denmark presented the highest percentage of people who got tested in a PHC setting (87.3%). Positivity of tests performed in a primary

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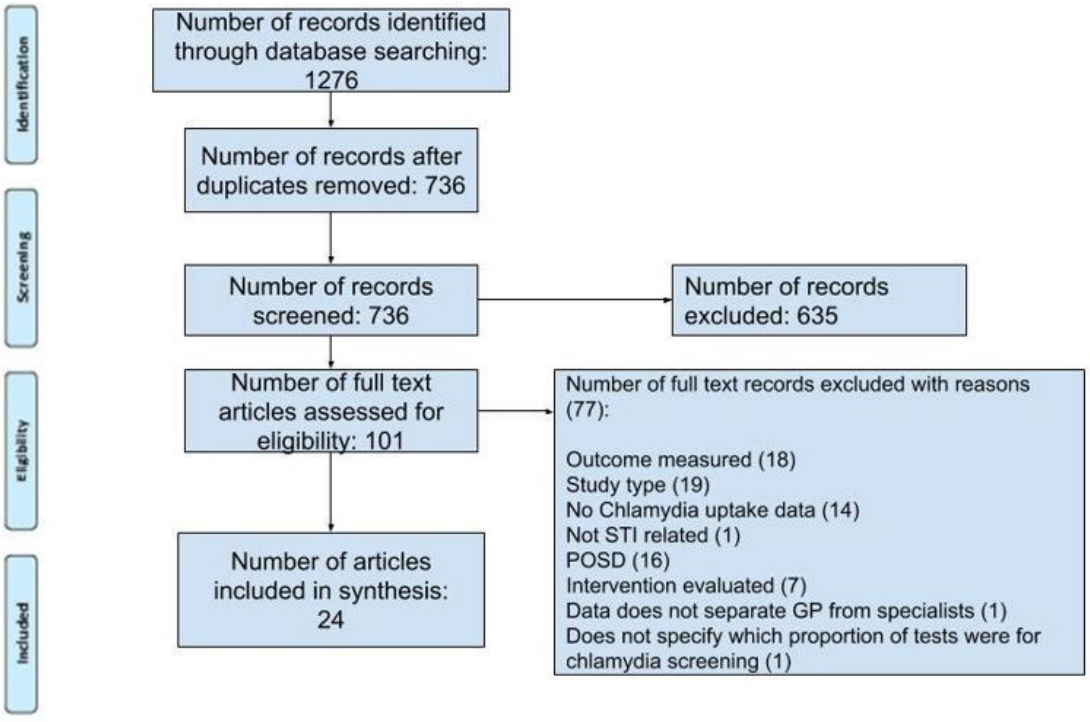


Figure 1 Prisma flow chart.
Exclusion reasons: 'Outcome measured' involves those papers that did not include any of the outcome measures as stated on the PICOS, while 'No Chlamydia uptake data' contains those which measured STI testing but did not disaggregate the results for chlamydia. 'Intervention evaluated' comprises papers which intervention was not related to the aim of this paper. POSD, point of service delivery.

care setting ranged from 1.5% to 20.8% among women, from 2.2% to 30% among men and from 4.3% to 14.7% when both genders were reported together.

Table 2 Geographical location of the studies

Country	Locations
UK	Britain (National)[23 26 32 38] England (National)[31] Nottingham[20] Wirral and Portsmouth/South East Hampshire[21] Sheffield[25] Scotland[8] Cornwall[27] London[28 29] Brent and Avon[30] Northern Ireland[35]
Netherlands	National[33] Amsterdam, Rotterdam and South Limburg[9] South Limburg[34] Amsterdam and Gooi[37]
Denmark	Frederiksborg County[12] Ringkjøbing County[24] Copenhagen[36]
Norway	Trondheim[22] Vestfold[39]
Belgium	Antwerp[10]

The research from Verhoeven and colleagues was the only one to provide data from Belgium in the form of an 'effective screening rate in women at risk', meaning women eligible for testing, consented, with a urine sample provided and a valid result obtained.[10] The 'overall effective screening rate' was also used. This stands for tests performed with a valid result in women at risk and no test in women not at risk.[10]

DISCUSSION

Main findings

The database search generated 24 studies to be included in the review. Only 5 of the 53 countries comprising the systematic review generated results (9% of the region). These countries being the UK, Netherlands, Denmark, Norway and Belgium. More than 60% (15 of 24) of the selected studies were cross-sectional. At the same time, there was clear predominance of UK research. This study showed data heterogeneity and lack of unified reporting indicators for chlamydia testing uptake in primary care, across the European region.

In the UK, healthcare provision is mainly through the National Health Service (NHS). Strong initiatives such as the National Chlamydia Screening Programme (NCSP), established in 2003, have set the topic under scope, and therefore, encouraged research in the area. Public Health England recommends a local detection rate of at least 2300 per 100 000 population. 'Local authorities have

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Table 3 Summary of UCT reported in PHC[8–10 12 20–39]

Indicator	Women	Men	Both genders
Acceptability if offered test in PHC	55%–81.4%	3.8%–29.4% (Denmark)	9.5%–70.6%
% who got tested in PHC (coverage)	27%–50%	6%–17.1%	3.32%–87.3%
% in high risk who got tested in PHC	45%–77.6%		
% of "x" gender tests performed in PHC	18% (UK)	5.1%–9% (UK)	15%–21%
% of the tests in PHC that were performed on "x" gender	63.1%–98%	2%–36.9% (calculated)	
% of PHC patients who request chlamydia testing when consulting for STI			74.8% (Netherlands)
% patients in PHC who get tested			61.7%–63.8% (UK)

PHC, primary healthcare; STI, sexually transmitted infection; UCT, uptake of chlamydia testing.

a statutory duty to ensure the provision of open access services including free STI testing and treatment. The chlamydia screening policy in the UK establishes that testing should be offered as an integrated component of existing SRHS including primary care based services'.[11]

Overall, both acceptance and coverage are higher in women. Similarly, testing opportunities target mostly women. For example, in Denmark, the testing is offered before inserting an intrauterine device or coil (IUD) and most studies analyse women populations.[12] The Danish Guideline indicates opportunistic chlamydia testing in primary care for asymptomatic individuals with frequent sex partner change, women under 26 before IUD insertion or hysterosalpingogram. Notwithstanding, it is important to reinforce the message to clinical practitioners and researchers, that men are carriers and should be tested as much as women.

Most women and men will accept the test if offered, compared with the GP waiting for the patient to request it. However, the Netherlands presents lower acceptability, possibly due to their insurance health system structure, that does not cover STI testing for people over 25 years old unless they belong to a risk group (eg, sex workers), making it an out-of-pocket expenditure, different from the NHS (UK) in which this test is offered for free, in line with other services.[13–15] The Dutch General Practitioners' Society (NHG) standards state that young people under 25 years of age regardless of complaints or risk group should always be offered a chlamydia test.

As mentioned, Denmark presented the highest percentage of tested people (87.3%; both genders reported together) who did so in a PHC setting. We could assume this is due to the strong gatekeeping role of the GPs within their healthcare system. The majority of the Danish population (98%) is registered with their GPs.[15] 22% of physicians work in general practice and their income depends on 30% of capitation and on 70% on fee-for-service.[16]

Norwegian studies reported scattered information and more evidence would be needed to identify current uptake. Nonetheless, they appear to follow the trend of higher uptake among women compared with men. Norwegian country guidelines currently recommend testing individuals under 25 years of age, regardless of sex when there is a change of sexual partner, pregnancy or IUD insertion. Other indications include symptomatic patients, women performing abortions, men who have sex with men and persons identified through contact tracing. Norway does not have an opportunistic or systematic screening programme for chlamydia. However, chlamydia testing is available at no extra cost at GP surgeries, in hospitals and specialised clinics.

Belgian doctors do not have a national guideline for STI management. Nevertheless, a general practice guideline named 'early detection of chlamydia trachomatis' has been disseminated in Flanders (northern Belgium) and early detection of STIs was part of a national prenatal care guideline.

The 'overall effective screening rate' used by Verhoeven and colleagues is valuable in the sense that it provides information regarding valid tests only. Valid tests mean those with samples that were actually possible to process by the laboratory and produced results, as sampling, storage and transport conditions may not always meet the standards required. Therefore, it gives a more accurate picture of successful screening.[10] On that account, this type of indicator could be useful for shaping policy and should be considered for report standardisation of the countries within the region.

In 2009, the WHO's Department of Reproductive Health and Research performed a survey on the role of PHC in SRHS primarily in low-income and middle-income countries.[1] A similar study should be carried out across the European region in order to get together information on how SRHS are provided in each country by primary care providers. This will help to shape policy by detecting not only the current gaps but also multiplicity of services provision. To improve the testing uptake, triple integration of primary care, SRHS and public health should be considered to eliminate service duplication and deliver effective service.[17]

Our results are slightly similar to those of Uusküla and colleagues in 2014 and 2017,[18 19] regarding the difficulty of results generalisability and percentage of tests performed in PHC with both genders reported together (15%–21% vs 6%–18%[18]). Nevertheless, comparison is

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not completely possible as the sources and country mix in the studies are different.

The authors believe that, despite the existence of STI or genitourinary medicine (GUM) clinics, the role of the GP in chlamydia testing is unique. Visits to STI/GUM services still carry, to some extent, an associated stigma while the GP (family doctor) is considered a figure in the community to be trusted and where people's motivation to seek care or advice is under less social scrutiny.

Strengths and limitations

The key strength of this research stems from the exclusiveness of the findings to one geographical area (Europe) and the exhaustiveness in the sense that all 53 countries belonging to the WHO region were considered in the database search. This contrasts with previous systematic reviews in that they mixed countries from different continents, making it difficult to analyse the region. Such fact makes the findings valuable as a new addition to the literature.

An additional strength of the study is that due to the selected inclusion criteria, it allowed for country comparisons and detection of non-reporting countries. Furthermore, it highlighted the need for standardised primary care electronic databases that allow homogeneous data collection. The category of data generated by this study is highly valued by the WHO and other international organisations.

The term 'integration' has different meaning in different countries (merged service, working together, SRH professional based in primary care and so on). Therefore, generalising the results becomes more difficult. However, it was possible to link PHC through the words commonly used to address it. For example, family doctor, family medicine, GP, community medicine, community nurses and so on. Countries with no study data reported may be due to:

- The study names primary care with an uncommon term not listed in the inclusion criteria.
- The country does not perform chlamydia testing in primary care, but may perform other SRHS like HIV screening.
- The country does not have any SRHS within primary care.
- There is no research on this specific topic in the country.
- The data are only available in the grey literature.

CONCLUSION

Steps towards the integration of SRHS with primary care, such as chlamydia testing, are sparsely documented and a paucity of evidence is available between the European countries. It seems that women have a greater UCT in primary care settings compared with men. However, further research is needed to produce an accurate view of the region. The UK is the country with most documented evidence, followed by the Netherlands, although acceptance for chlamydia testing in the latter is lower when offered.

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