Public Health England

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News

Volume 8 Number 24 Published on: **20 June 2014**

Declines in genital warts since start of the HPV immunisation programme

Genital warts (GW) diagnoses in genitourinary medicine (GUM) clinics (collected in the GUM Clinic Activity Dataset (GUMCADv2)) among 15-19 year-old females in 2013 were 6% lower than in 2012 (511 vs 544/100,000). This continues the trend seen since 2008 of declining GW among females eligible for HPV immunisation.

The United Kingdom was the first country to introduce (in September 2008) a national human papillomavirus (HPV) immunisation programme using the bivalent HPV 16/18 vaccine (*Cervarix*; GlaxoSmithKline). This vaccine was used until September 2012. The programme has attained high coverage, with reported three-dose coverage in the routine cohorts, vaccinated at age 12-13 years, of more than 80% and approximately 40% or greater in the oldest catch-up cohorts, immunised at age 17 years [1-3].

The quadrivalent HPV 6/11/16/18 vaccine (*Gardasil*; Sanofi Pasteur MSD) – which replaced *Cervarix* in the UK immunisation programme from September 2012 [4] – has been shown to be highly effective in preventing GW (mostly caused by low risk HPV types 6 and 11), both in clinical trials and in practice in high-coverage immunisation programmes [5]. However, no impact on GW was anticipated from the use of the bivalent HPV 16/18 vaccine in the immunisation programme in England [6].

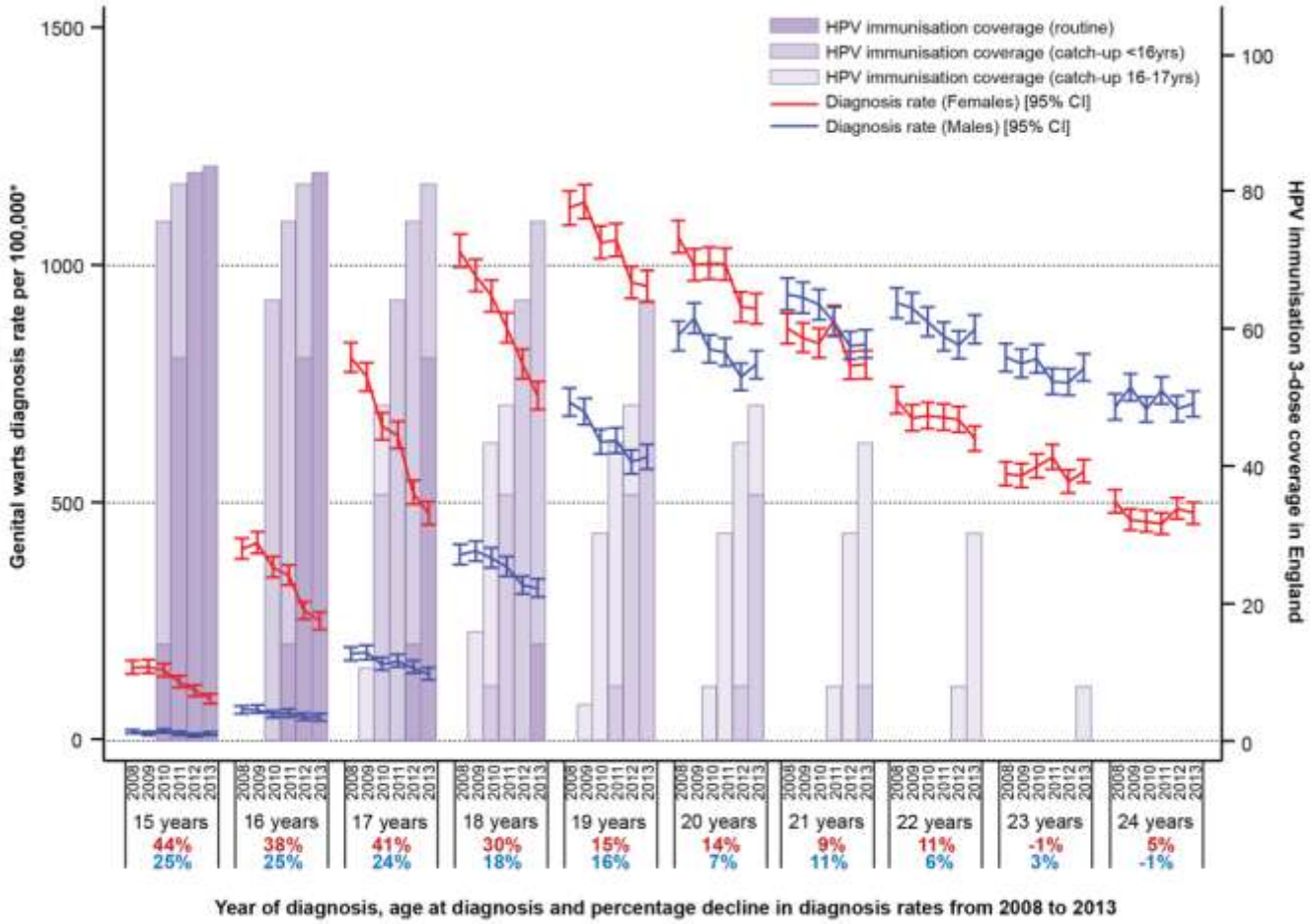
A slight but notable decrease in the number of GW diagnoses in GUM clinics among young females was observed in data from 2008 to 2011[7]. Subsequent more detailed ecological analyses, and similar analyses of GW diagnoses in General Practice, found the size and pattern of the declines strongly suggestive of an unexpected, moderately protective effect of HPV 16/18 vaccination against GW [8].

Data to the end of 2013 show a rise in numbers of GW diagnoses (at all ages) in the last 10 years in males, and in females a parallel rise up to 2008 followed by a decline [9]. This overall levelling of GW diagnoses in females in the past 10 years was due to continuation of the declines seen since 2008 among young females. There was a significant decrease of 28% (95% CI 26%-30%) in the number of GW diagnoses at GUM clinics per 100,000

population (using mid-year population denominators) between 2008 and 2013 for females aged 15 to 19 years, and of 9% (95% CI 7%-11%) for females aged 20-24 years. A decrease of 17% (95%CI13%-21%) was seen for 15-19 year old males over the same time period (see figure). The greatest declines were seen among 15, 16 and 17 year old females (43.7%, 37.9%, and 40.9% respectively). Females aged 15-17 years in 2013 would have been aged 9-14 years at the start of the vaccination programme in 2008, and therefore largely eligible for routine HPV vaccination (with reported coverage of >80%). The percentage declines lessen with increasing age, as does the estimated vaccine coverage (and the age at vaccination increases). In females above the age eligible for HPV immunisation, and same aged males, diagnoses rates showed no similar declines (see figure).

The factors that might be contributing to declines in GW in young females have been discussed previously, with analysis of data to end 2011 [8]. This updated analysis of data to the end of 2013 shows greater decreases in GW diagnoses and a strengthening of the association with coverage of the bivalent HPV16/18 immunisation. A post hoc analysis of the PATRICIA (PApilloma TRIal against Cancer In young Adults) trial has shown moderate efficacy for the bivalent HPV16/18 vaccine against persistent infection with a number of low risk HPV types, and estimated efficacy for six-month persistent infection with HPV 6/11 of 34.9% (9.1 to 53.7) [10]. There is some biological plausibility for broad cross protection from the bivalent vaccine [11]. No other sufficient explanations for the pattern and size of the declines in females have come to light. We are conducting a case-control analysis of GW among females eligible for bivalent vaccination to investigate this further. The smaller declines in young males are suggestive of a herd-protective effect from cross-protection against 6/11 in females receiving the bivalent vaccine. However, the other factors that may be contributing to declines in females, including private use of the quadrivalent vaccine, imported herd-protection from quadrivalent vaccine use abroad and herd-protection against a proportion of GW caused by HPV16/18, could – if summed – explain the declines among males within probable ranges of uncertainty.

Rates of first genital wart diagnosis in females (with error bars showing 95% confidence intervals) and human papillomavirus immunisation coverage in England, by age and year



* Restricted to clinics that reported disaggregate data since 2008 (171 of 212 clinics). Genital warts counts adjusted for sampling restriction

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Infection reports

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Trends in mandatory *Staphylococcus aureus* (MRSA and MSSA) and *Escherichia coli* bacteraemia, and *Clostridium difficile* infection (CDI) data for England up to January-March 2014

This quarterly epidemiological commentary describes recent trends for mandatory surveillance of *Staphylococcus aureus* (MRSA and MSSA [1]) and *E. coli* [2] bacteraemia, and *Clostridium difficile* infections [3] reported by NHS acute Trust hospitals in England up to January – March 2014

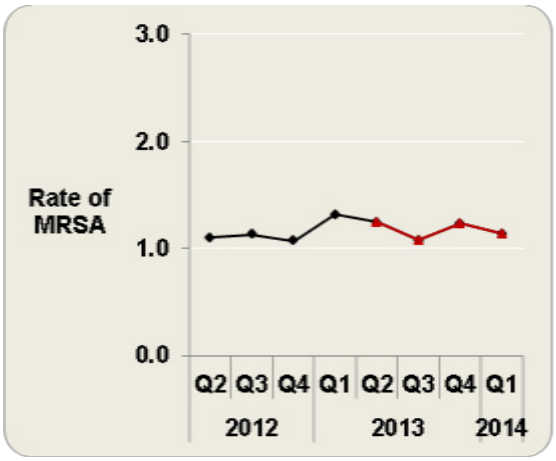
MRSA Bacteraemia

- Since April 2013 all NHS organisations reporting positive cases of MRSA bacteraemia have been required to complete a Post Infection Review (PIR)*. MRSA bacteraemia cases since April 2013 are now published by PIR assignment rather than apportionment.
- The total number of MRSA bacteraemia reports has decreased compared to the same period last year (206 reports in Q1 2014 and 252 reports in Q1 2013). In the intervening periods the total count of cases has ranged from 201 (Q3 2013) to 252 (Q1 2013).
- There has been a slight decrease between Q4 2013 and Q1 2014 for both Trusts assigned and CCG assigned reports from 106 reports to 100 reports and from 112 reports to 106 reports respectively. The proportion of Trust assigned reports has shown little variation since Q2 2013 with approximately 45-48% of reports being Trust assigned.

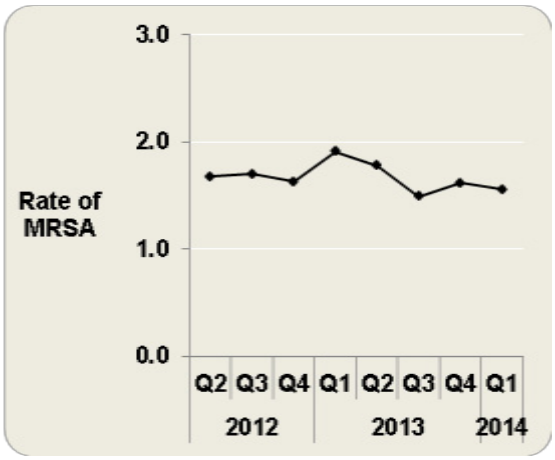
* See: http://www.hpa.org.uk/webw/HPAweb&HPAwebStandard/HPAweb_C/1317138536251 for more information.

Figure 1: Quarterly rates of MRSA bacteraemia, April 2012- March 2014

a) Trust apportioned/assigned* rate (per 100,000 bed-days)



b) All reports (per 100,000 population)



Note: *The Trust apportioned rates for Q2 and Q3 2013 are missing because since Q2 2013 MRSA cases have been reported by assignment rather than apportionment, please refer to table 1b for trust assigned reported cases and rates.*

Table 1a: MRSA bacteraemia counts and rates by quarter, January 2010- March 2014

Year and quarter		Trust apportioned reports	Trust apportioned rates (per 100,000 bed-days)	All reports	All reports rates (per 100,000 population)
2010	**Q4**	155	1.76	331	2.49
2011	**Q1**	149	1.70	333	2.54
	Q2	148	1.71	319	2.41
	Q3	103	1.21	266	1.99
	Q4	105	1.21	269	2.01
2012	**Q1**	117	1.31	262	1.97
	Q2	94	1.10	224	1.68
	Q3	96	1.13	229	1.70
	Q4	92	1.07	219	1.63
2013	**Q1**	116	1.32	252	1.91
	Q2	N/A	N/A	237	1.78
	Q3	N/A	N/A	201	1.49
	Q4	N/A	N/A	218	1.62
2014	**Q1**	N/A	N/A	206	1.56

Table 1b: MRSA bacteraemia counts and rates by PIR assignment, April 2013-March 2014

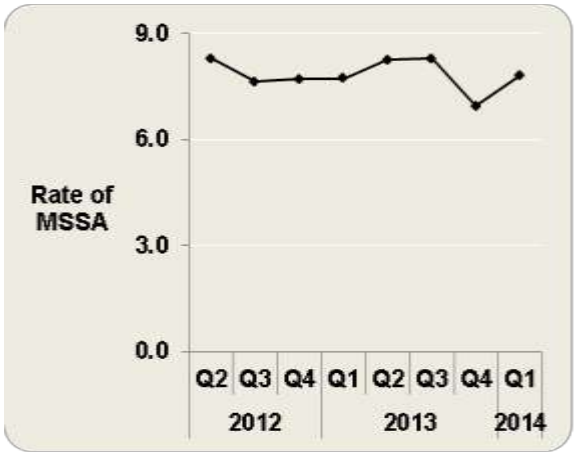
Year and quarter		Trust assigned reports	Trust assigned rates (per 100,000 bed-days)	CCG assigned reports	CCG assigned rates (per 100,000 population)
2013	**Q2**	107	1.24	130	0.97
	Q3	91	1.08	109	0.81
	Q4	106	1.24	112	0.83
2014	**Q1**	100	1.14	106	0.80

MSSA Bacteraemia

- Trust apportioned and population rates have remained relatively stable over the 8 quarters. Small increases have been noted for both Trust apportioned and population rates between Q1 2013 and Q1 2014, from 7.73 to 7.83 per 100,000 bed days and from 17.11 to 18.19 per 100,000 population respectively (Figure 2), suggesting overall rates have not varied greatly.
- The highest Trust apportioned rate was in Q3 2011 with 8.55 per 100,000 bed-days whilst the lowest was in Q4 2013 with 6.95 per 100,000 bed-days. The highest population rate was seen in the most recent quarter Q1 2014 with 18.19 per 100,000 population, whilst the lowest was in Q3 2012 with 15.85 per 100,000 population.
- Although there have been slight fluctuations in the number of reports between the quarters, there are no substantial increases (table 2).

Figure 2: Quarterly rates of MSSA bacteraemia, April 2012- March 2014

b) Trust apportioned rate (per 100,000 bed-days)



b) All reports (per 100,000 population)

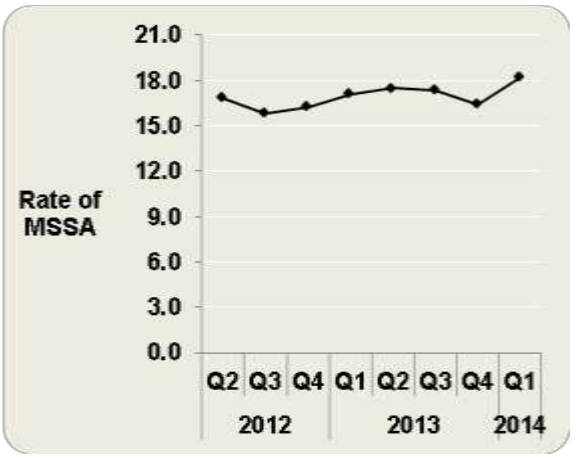


Table 2: MSSA bacteraemia counts and rates by quarter, January 2011- March 2014

Year and quarter		Trust apportioned reports	Trust apportioned rates (per 100,000 bed-days)	All reports	All reports rates (per 100,000 population)
2011	**Q1**	735	8.40	2,199	16.79
	Q2	698	8.08	2,191	16.55
	Q3	725	8.55	2,226	16.63
	Q4	703	8.12	2,167	16.19
2012	**Q1**	728	8.16	2,183	16.41
	Q2	711	8.29	2,238	16.83
	Q3	648	7.64	2,131	15.85
	Q4	663	7.71	2,186	16.26
2013	**Q1**	678	7.73	2,257	17.11
	Q2	711	8.26	2,330	17.47
	Q3	700	8.30	2,344	17.38
	Q4	596	6.95	2,214	16.42
2014	**Q1**	687	7.83	2,399	18.19

E.coli bacteraemia

- Mandatory *E.coli* bacteraemia surveillance commenced in June 2011. The rate of E.coli bacteraemia has been stable over the last eight quarters. There has been a slight rate increase in the most recent quarter, Q1 2014, in line with the same trend seen in the same quarter in 2013. Since the commencement of *E.coli* bacteraemia surveillance, Q3 2013 had the highest rate of 66.95 per 100,000 population, while the lowest was 57.63 per 100,000 population in Q1 2013 (Figure 3).
- There was little variation in the number of reports from quarter to quarter, in line with the rates. The highest number of reports was seen in Q3 2013 with 9,027 reports, while the lowest was observed in Q1 2013 with 7,602 reports (table 3).

Figure 3: Quarterly rates of *E. coli* bacteraemia reports per 100,000 population, April 2012-March 2014

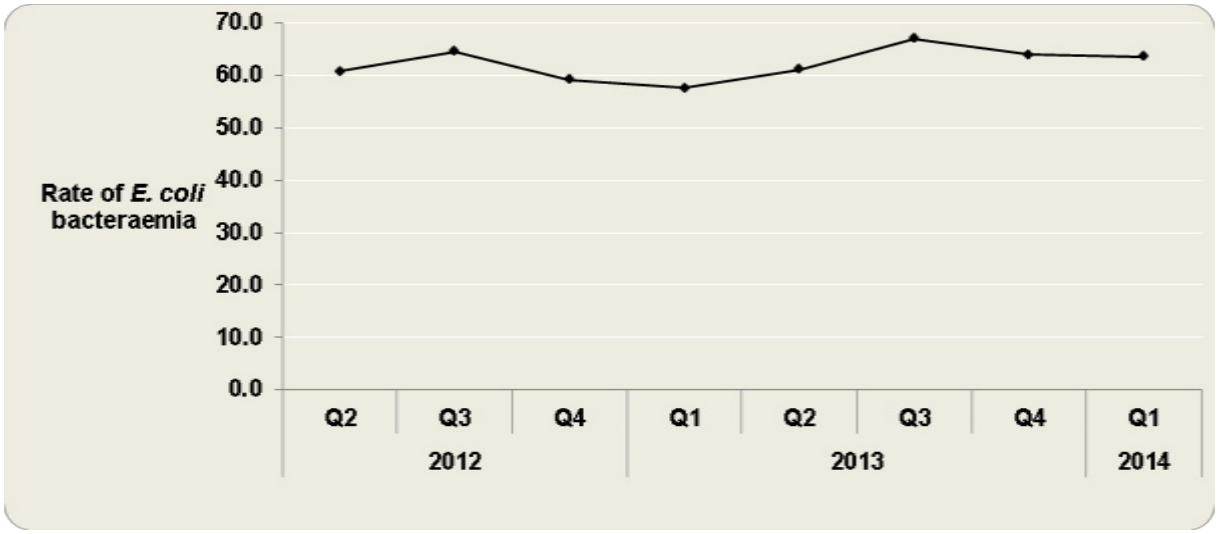


Table 3: Quarterly counts and rates of all *E. coli* bacteraemia reports by quarter, July 2011-March 2014

Year and quarter		Total *E. coli* bacteraemia reports	Rate (per 100,000 population)
2011	**Q3**	8,275	61.82
	Q4	8,098	60.50
2012	**Q1**	7,698	57.88
	Q2	8,074	60.71
	Q3	8,676	64.52
	Q4	7,957	59.18
2013	**Q1**	7,602	57.63
	Q2	8,158	61.17
	Q3	9,027	66.95
	Q4	8,619	63.92
2014	**Q1**	8,380	63.53

Clostridium difficile infection

- Between Q1 2012 and Q1 2014, the rate of Trust apportioned cases per 100,000 bed days has decreased by 27.0% from 18.07 to 13.19. Over the same period, the rate of total CDI cases per 100,000 population declined by 18.3% from 28.64 to 23.39 (Figure 4).
- The total number of CDI reports has decreased by 12% when compared to the same period last year – from 3,412 reports in Q1 2013 to 3,005 reports in Q1 2014. This is part of a gradual decrease of 40% since Q4 2010 when there were 4,984 reports (table 4).
- Trust apportioned reports have declined by 52% between Q4 2010 and Q1 2014, from 2,431 reports to 1,157 reports respectively (table 4).

Figure 4: Quarterly rates of *C. difficile* infection in patients aged 2 years and over, April 2012-March 2014

a) Trust apportioned reports (per 100,000 bed-days) b) All reports (per 100,000 population)

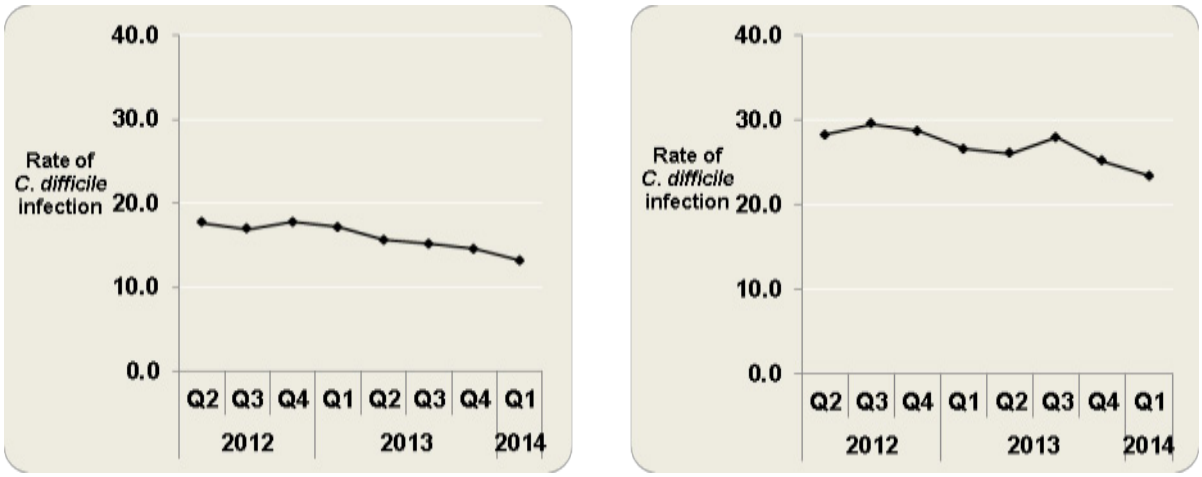


Table 4: *C. difficile* infection counts and rates in patients aged 2 years and over by quarter, October 2010 - March 2014

Year and quarter		Trust apportioned reports	Trust apportioned rates (per 100,000 bed-days)	All reports	All reports rates (per 100,000 population)
2010	**Q4**	2,431	27.61	4,984	38.54
2011	**Q1**	2,358	26.94	4,833	37.87
	Q2	2,206	25.53	4,967	38.49
	Q3	2,046	24.12	4,994	38.28
	Q4	1,824	21.07	4,350	33.34
2012	**Q1**	1,613	18.07	3,711	28.64
	Q2	1,517	17.68	3,656	28.22
	Q3	1,433	16.91	3,870	29.54
	Q4	1,527	17.76	3,756	28.67
2013	**Q1**	1,503	17.14	3,412	26.55
	Q2	1,346	15.64	3,386	26.06
	Q3	1,277	15.15	3,671	27.95
	Q4	1,249	14.56	3,298	25.11
2014	**Q1**	1,157	13.19	3,005	23.39

Notes

- ***MRSA bacteraemia PIR assigned reports:*** As of the 1st of April 2013, all MRSA bacteraemia cases reported via the HCAI Data Capture System (DCS) are assigned to either an acute Trust or a CCG through the completion of a Post Infection Review (PIR). A case is deemed to be Trust assigned where the completed PIR indicates that an acute Trust is the organisation best placed to ensure that any lessons learned are actioned. Further information on the PIR process can be found on the following webpage: http://www.england.nhs.uk/ourwork/patientsafety/zero-tolerance/
- ***MSSA bacteraemia Trust apportioned reports*:** The analysis of Trust apportioned and all other reports is based on the criteria originally applied to MRSA bacteraemia.
- ***CDI Trust apportioned reports*:** include patients who are (i) in-patients, day-patients, emergency assessment patients or not known; AND (ii) have had a specimen taken at an acute Trust or not known; AND (iii) specimen is in or after day 4 of the admission (admission date is considered day '1').
- ***Total reports*:** These are all the cases reported by an acute Trust. They consist of both Trust apportioned reports and reports NOT apportioned to the acute Trust.

Further epidemiological notes are available on the PHE website [4].

The next commentary will be published in September 2014.

References

1. Mandatory *Staphylococcus aureus* bacteraemia surveillance scheme
2. Mandatory *Escherichia coli* bacteraemia surveillance scheme
3. Mandatory *Clostridium difficile* infection surveillance scheme
4. Quarterly Epidemiological Commentaries on MRSA, MSSA, Escherichia coli bacteraemia and *C. difficile* infection.

Infection reports

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HIV-STIs

Sexually transmitted infections and chlamydia screening in England, 2013

- In 2013, there were approximately 450,000 diagnoses of sexually transmitted infections (STIs) made in England.
- The impact of STIs remains greatest in young heterosexuals under the age of 25 years and in men who have sex with men (MSM).
- The most commonly diagnosed STI was chlamydia, with 208,755 diagnoses made in 2013.
- The number of gonorrhoea diagnoses increased by 15% between 2012 and 2013.
- Large increases in STI diagnoses were seen in MSM, including a 26% increase in gonorrhoea diagnoses. Although partly due to increased testing in this population, ongoing high levels of unsafe sexual behaviour probably contributed to this rise.
- During the year, over 1.7 million chlamydia tests were carried out in England among young people aged 15 to 24 years old, with over 139,000 chlamydia diagnoses made.
- Thirty percent of Upper Tier Local Authorities (UTLAs) achieved a chlamydia diagnosis rate of at least 2,300 per 100,000 among 15 to 24 year olds, the recommended level for this Public Health Outcome Framework (PHOF) indicator. There was a strong relationship between chlamydia testing coverage and chlamydia diagnosis rates in UTLAs.

Recommendations:

- Prevention efforts, such as greater STI screening coverage and easier access to sexual health services, should be sustained and continue to focus on groups at highest risk.
- Individuals can significantly reduce their risk of catching or passing on an STI by:
    - Consistently and correctly using condoms until all partners have had a sexual health screen.
    - If in one of the highest risk groups, getting screened regularly will lead to early identification and treatment, as these infections are frequently asymptomatic:
        - Sexually active under 25 year olds should be screened for chlamydia every year, and on change of sexual partner.
        - MSM should have an HIV/STI screen at least annually or every three months if having unprotected sex with new or casual partners.
        - Black African men and women should also have an HIV test and a regular HIV/STI screen if having unprotected sex with new or casual partners.
    - Reducing the number of sexual partners and avoiding overlapping sexual relationships.

Introduction

This report presents data on the recent trends and epidemiology of STIs in England. It was compiled using data from genitourinary medicine (GUM) clinics collected in the GUM Clinic Activity Dataset (GUMCADv2) and, for chlamydia screening, from other community-based settings using the Chlamydia Testing Activity Dataset (CTAD), which is collected from laboratories. Data from both datasets are used by the National Chlamydia Screening Programme (NCSP), which aims to control chlamydia and reduce the sequelae of infection through the opportunistic screening of sexually active young people aged 15 to 24 years in England. Chlamydia screening is recommended annually and on change of sexual partner for sexually active young people, and is mainly delivered through primary care (general practices and pharmacies), community sexual and reproductive health (SRH) services (including termination of pregnancy services) and GUM clinics. Tests performed in community-based settings are assumed to be largely asymptomatic screens; tests performed in GUM clinics are assumed to be a combination of symptomatic tests and asymptomatic screens. The term 'test' is used herein to signify both asymptomatic screens and symptomatic tests. Local areas should work towards a chlamydia diagnosis rate of at least 2,300 per 100,000 population among 15 to 24 year olds, the recommended level for this Public Health Outcomes Framework (PHOF) indicator [1].

Overall trends in diagnoses in England

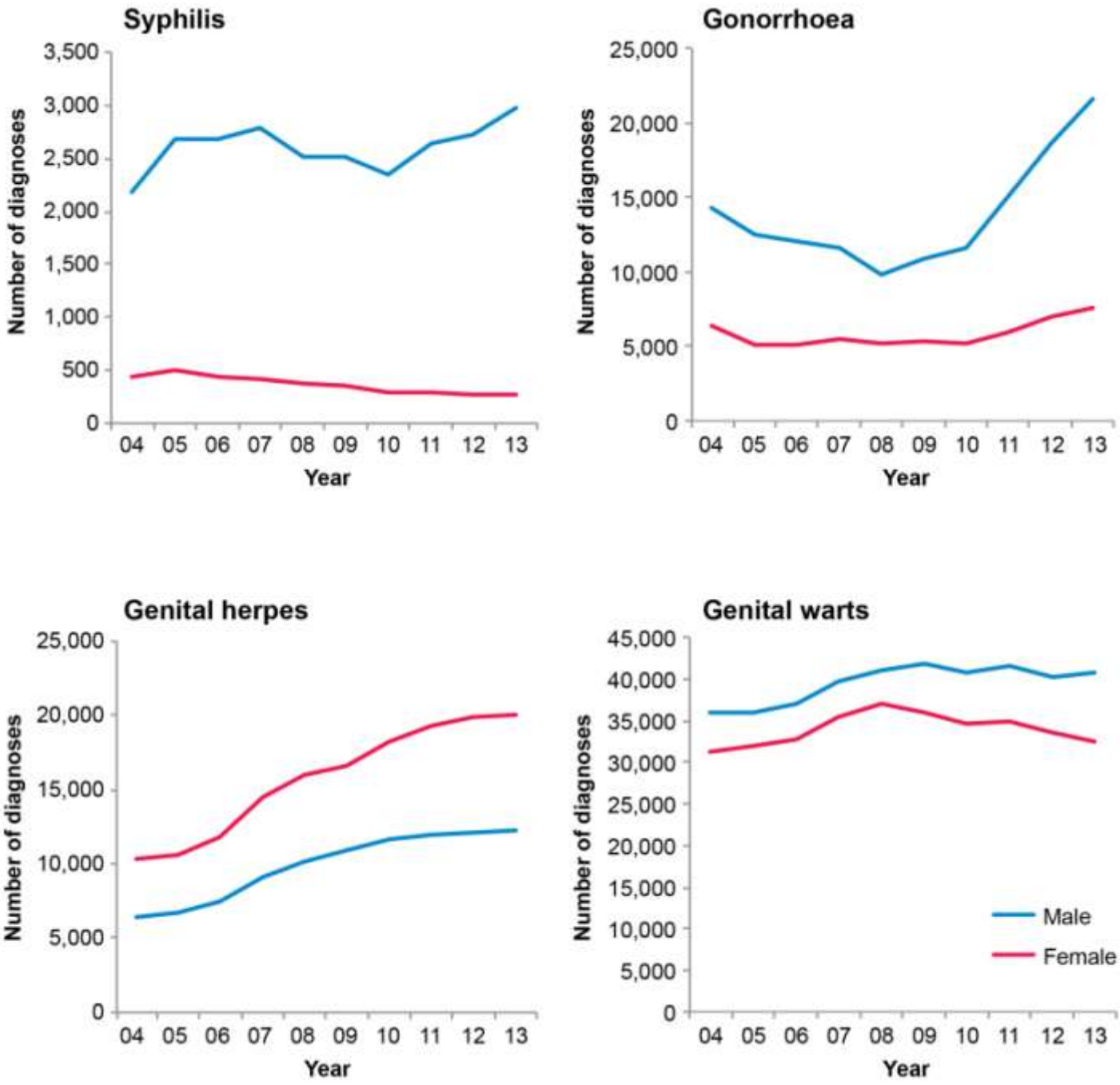
In 2013, the total number of new cases of STIs diagnosed in GUM clinics and, for chlamydia, in GUM and other community-based settings, decreased by 0.6% when compared to 2012 (446,253 vs. 448,775). Of the 446,253 new STI diagnoses made in 2013, the most commonly diagnosed STIs were chlamydia (208,755; 47%), genital warts (73,418; 17%), genital herpes (32,279; 7%), and gonorrhoea (29,291; 7%).

Between 2012 and 2013, there was an increase in diagnoses of gonorrhoea (15%; 25,577 to 29,291), and infectious syphilis (9%; 2,981 to 3,249). During the same period, diagnoses of non-specific genital infection (NSGI) fell by 10% (59,930 to 53,962).

Over the past decade, diagnoses of gonorrhoea, syphilis, genital warts and genital herpes have increased considerably, most notably in males [2] (figure 1; chlamydia is discussed in a later section). More STI testing in GUM clinics and through the NCSP [3] and routine use of more sensitive diagnostic tests will partly explain these increases, although ongoing unsafe sexual behaviour will have played an additional role. The increasing usage of nucleic acid amplification tests (NAATs) may also have contributed to the decreasing number of NSGI diagnoses.

Reliable data on the sexual orientation of patients is available from GUM clinics' GUMCADv2 data returns. Among diagnoses made at GUM clinics, there is substantial variation in the distribution of the most commonly diagnosed STIs by gender and sexual orientation. The most frequently reported gender/sexual orientation was MSM for diagnoses of syphilis (74%) and gonorrhoea (46%), heterosexual men for diagnoses of genital warts (49%), and heterosexual females for diagnoses of genital herpes (60%) and chlamydia (46%).

Figure 1. New diagnoses of syphilis (primary, secondary and early latent), gonorrhoea, genital herpes (first episode) and genital warts (first episode) at GUM clinics by gender, 2004–2013, England



Epidemiology of STIs in England

Men who have sex with men

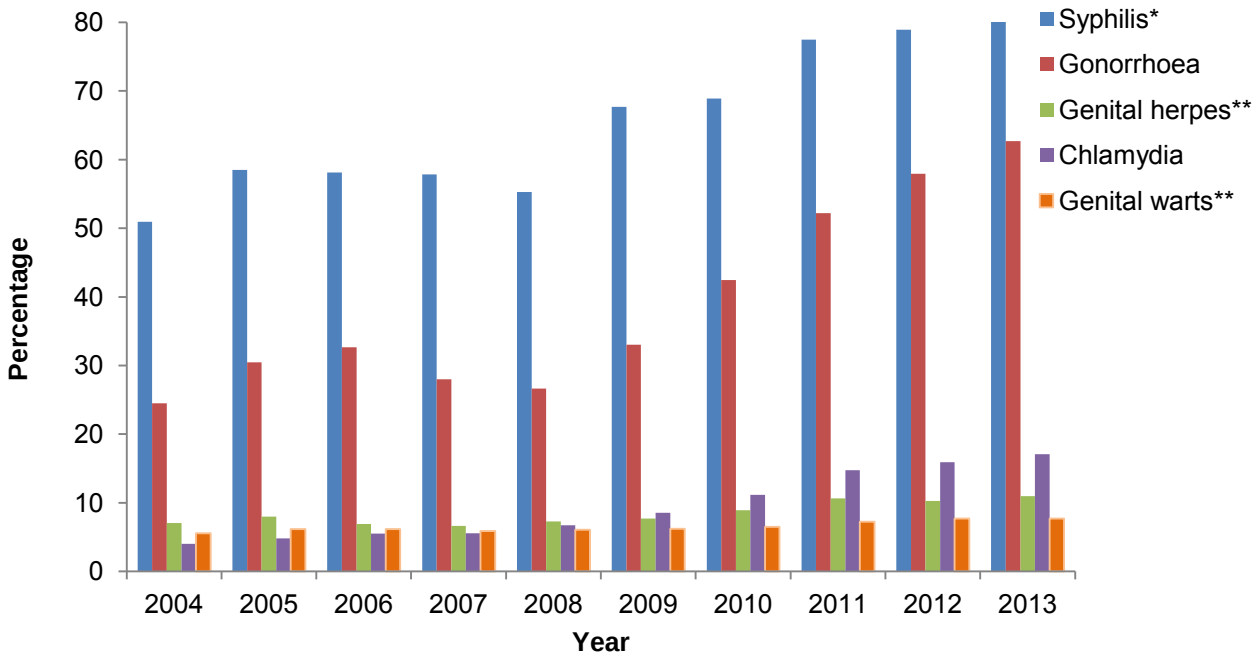
In England in 2013, among male GUM clinic attendees, 81% (2,393/2,970) of syphilis diagnoses, 63% (13,570/21,649) of gonorrhoea diagnoses, 17% (9,077/53,143) of chlamydia diagnoses, 11% (1,343/12,258) of genital herpes diagnoses and 8% (3,139/40,796) of genital warts diagnoses were among MSM (figure 2a).

The number of diagnoses of STIs reported in MSM has risen sharply in recent years and accounts for the majority of increased diagnoses seen among men. Gonorrhoea diagnoses increased by 26% in the past year (10,764 to 13,570), syphilis diagnoses by 12% (2,144 to 2,393), chlamydia diagnoses (from GUM) by 11% (8,212 to 9,077), and genital herpes diagnoses by 7% (1,250 to 1,343) (figure 2b).

A number of different factors are likely to have contributed to the sharp rise in diagnoses among MSM. More screening of extra-genital (rectal and pharyngeal) sites in MSM using NAATs [4], in response to current gonorrhoea testing guidance [5] and the Lymphogranuloma venereum (LGV) epidemic [6], will have significantly improved detection of gonococcal and chlamydial infections respectively. However, it is also likely that ongoing high levels of unsafe sex are leading to more STI transmission in this population. These rises coincide with the ongoing LGV and *Shigella flexneri* epidemics [6,7,8] and outbreaks of *Shigella sonnei* and syphilis in this population, often associated with HIV sero-adaptive behaviours. Gonorrhoea was the most commonly diagnosed STI among MSM in 2013, and 25% (3,382) presented with rectal infections. High levels of gonorrhoea transmission are of particular concern, as data from the Gonoccocal Resistance to Antimicrobials Surveilllance Programme (GRASP) show the emergence of gonococcal isolates with decreased susceptibility to cefixime among MSM [9].

Men who have sex with men continue to experience high rates of STIs and remain a priority for targeted HIV and STI prevention and health promotion work. This summer, PHE will publish a strategic framework to promote the health and wellbeing of gay, bisexual and other MSM. The vision of this framework is for all MSM to enjoy long healthy lives, and create and sustain respectful and fulfilling social and sexual relationships.

Figure 2a. Proportion of all male STI diagnoses which are among men who have sex with men, GUM clinics, 2004–2013, England

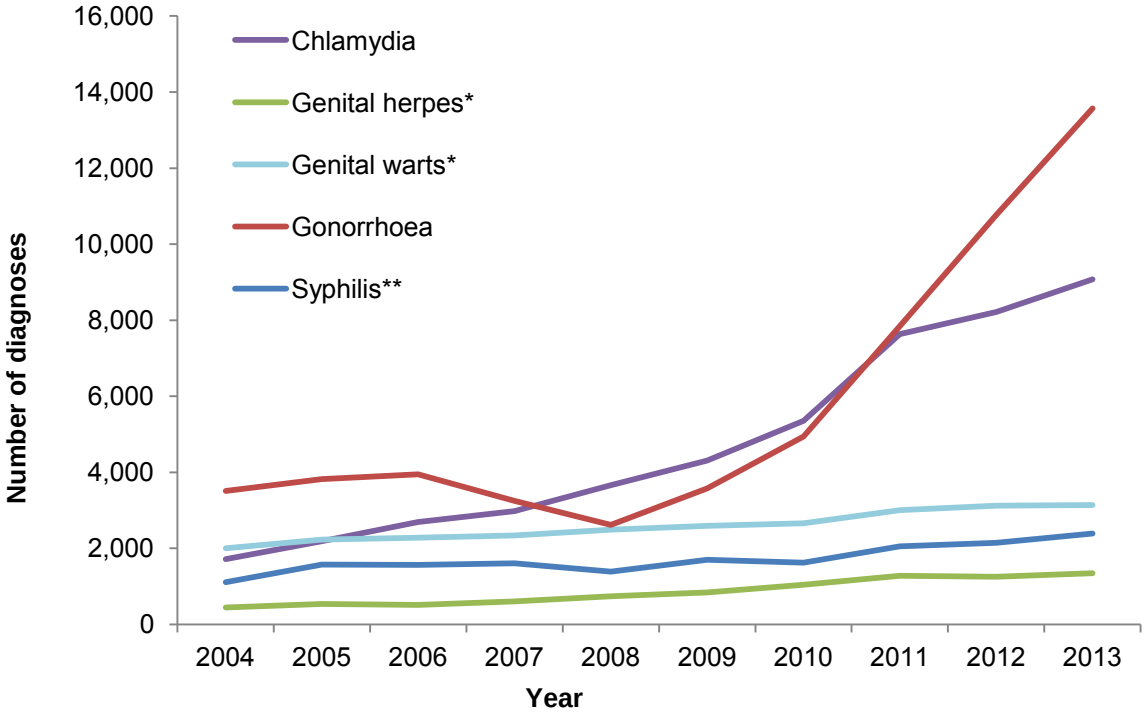


*

* Primary, secondary and early latent

** First episode

Figure 2b. Number of new diagnoses of selected STIs in men who have sex with men, GUM clinics, 2004–2013, England



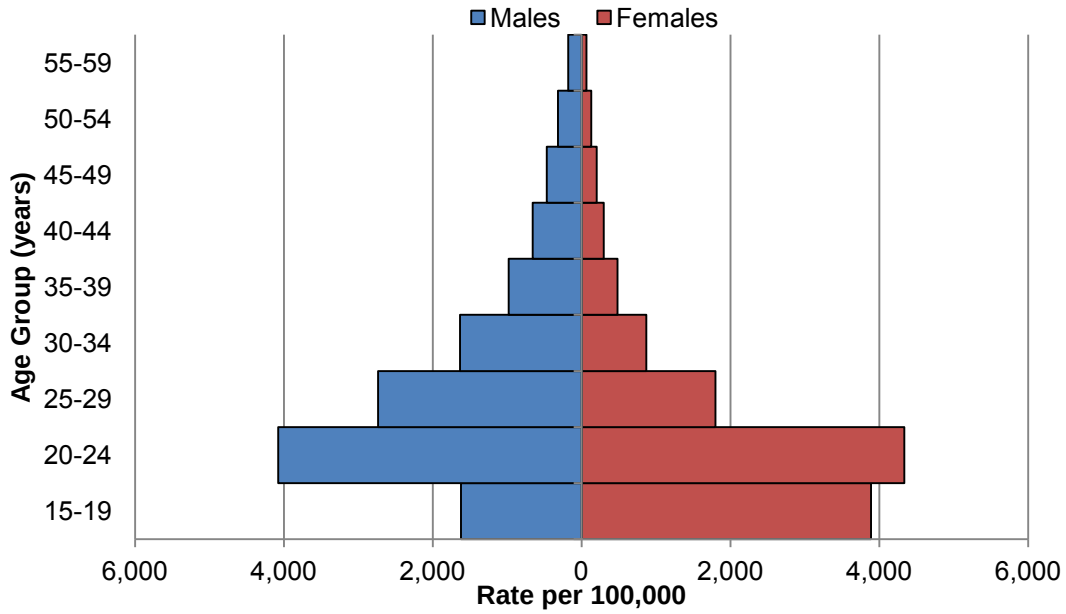
* First episode

** Primary, secondary and early latent

Young heterosexuals and STIs

Although there has been little change in the median number of lifetime sex partners in young persons aged 15 to 24 years in 2010–2012 relative to 1999–2001 [10], they continue to experience the highest rates of STIs (figures 3, 4a and 4b). In 2013, among heterosexuals diagnosed in GUM clinics, 63% (56,034/88,562) with chlamydia, 56% (8,122/14,647) with gonorrhoea, 54% (36,312/67,707) with genital warts, and 42% (12,450/29,871) with genital herpes were aged 15 to 24 years. Chlamydial infection in young people is discussed further in a following section. Although overall numbers of diagnoses in those aged 15 to 24 years have risen considerably in the last ten years, there has been some decline recently in cases of genital warts in young females (figure 4b). This decreasing trend is discussed in an accompanying article in this issue of the HPR [11].

Figure 3. Rates of new* STI diagnoses by age group and gender***, 2013, England**

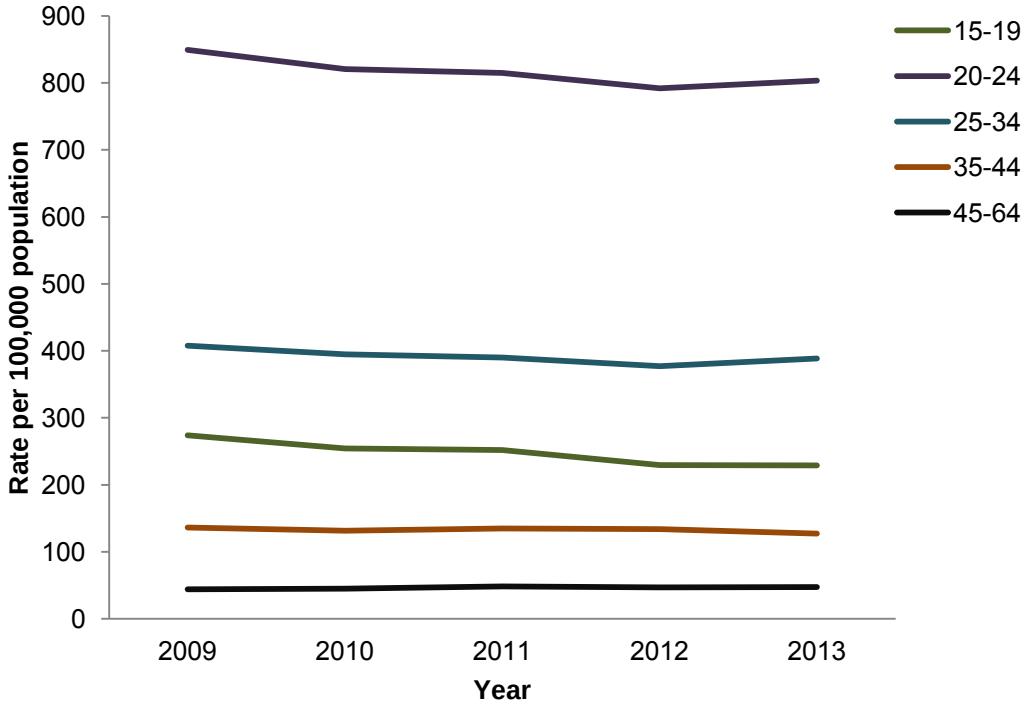


* New STIs include Chlamydia, Anogenital Warts (first episode), Non-Specific Genital Infection, Anogenital Herpes (first episode), Gonorrhoea, Syphilis (primary, secondary & early latent), new HIV diagnoses (acute infection and AIDS-defining illness), as well as Chancroid/LGV/Donovanosis, Molluscum contagiosum, Pelvic Inflammatory Disease & Epididymitis, Scabies/Pediculosis pubis, and Trichomoniasis

** Data from routine GUM clinic returns; data from community services included for chlamydia only

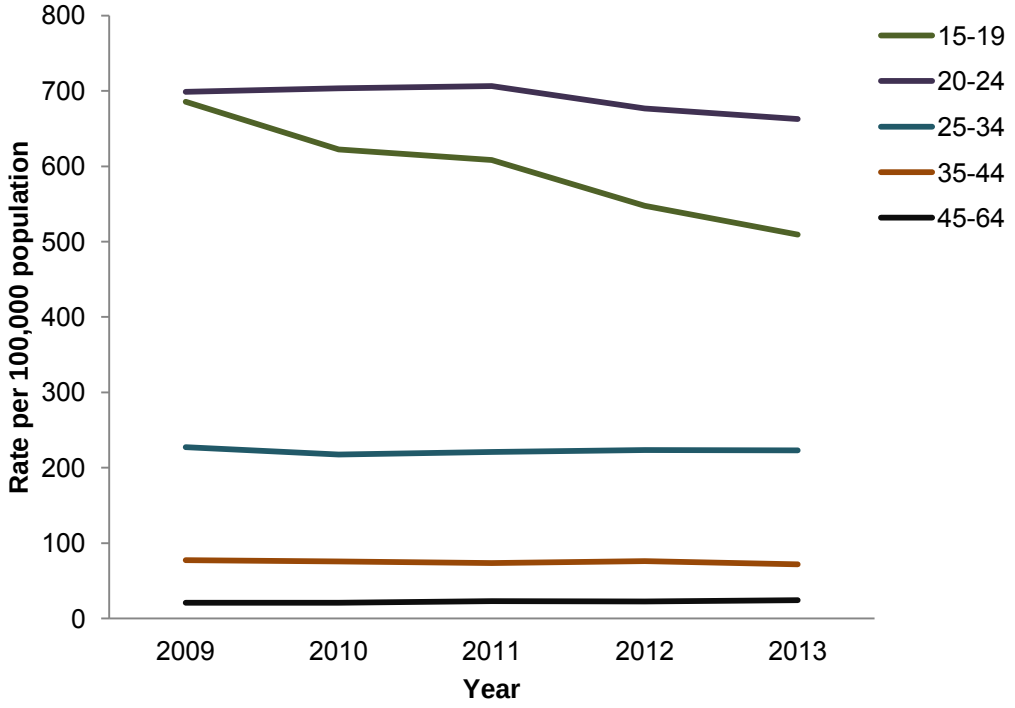
*** Excludes diagnoses where gender was reported as 'unknown'

Figure 4a. Rates of genital warts (first episode) diagnoses* in males by age group, 2009–2013, England**



* Data from routine GUM clinic returns; ** Years

Figure 4b. Rates of genital warts (first episode) diagnoses* in females by age group, 2009–2013, England**



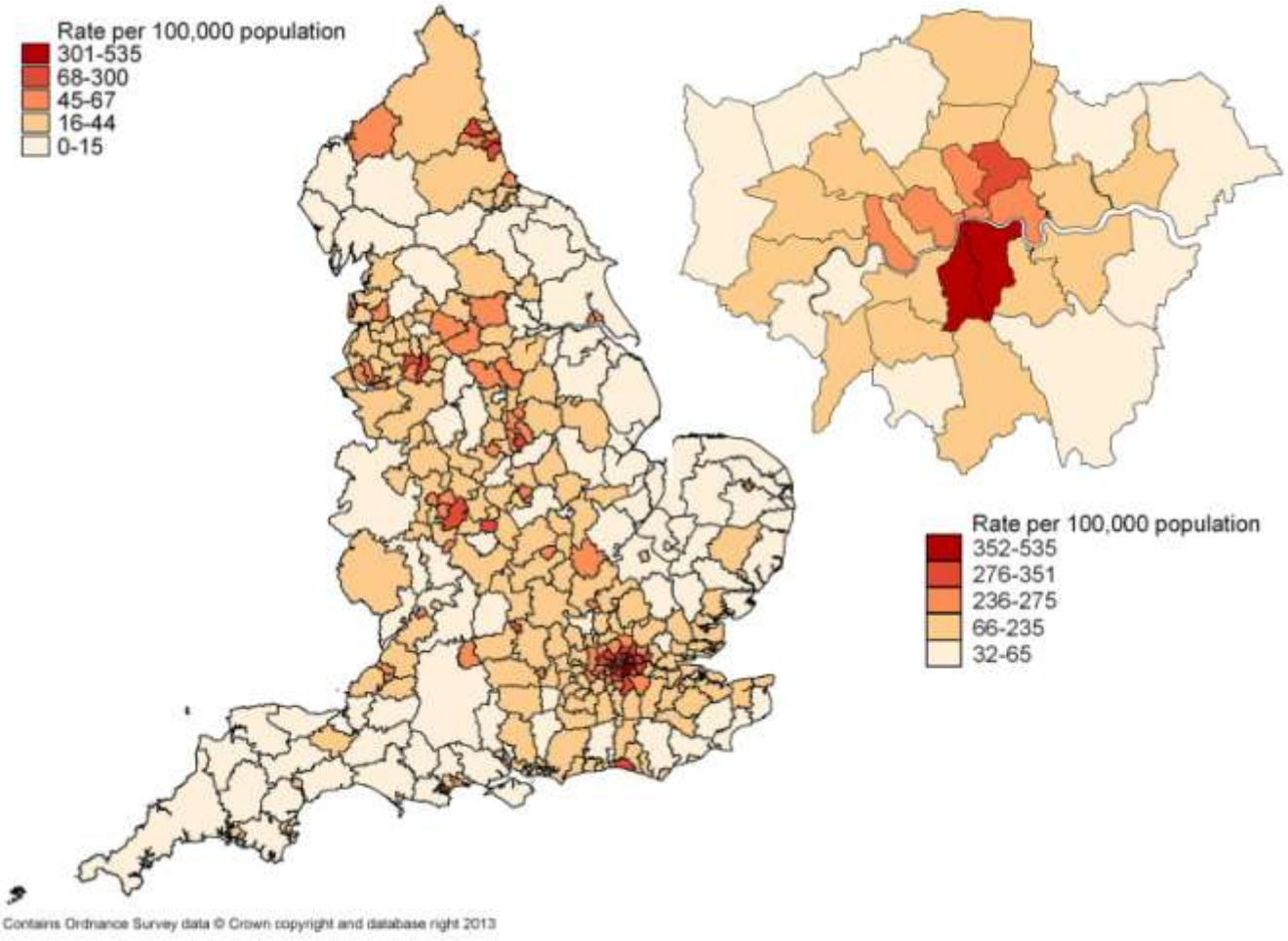
* Data from routine GUM clinic returns; ** Years

STI distribution by local area of residence

There is considerable geographic variation in the distribution of STIs. To demonstrate this, in 2013, the rate of gonorrhoea diagnoses by lower-tier Local Authority (LA) ranged from 0 (Isles of Scilly) to 533 (Lambeth) per 100,000 population. Rates were highest in residents of urban areas, especially in London, reflecting, to a large extent, the distribution of core groups of the population who are at greatest risk of infection and areas of higher deprivation [15,16] (figures 5a and 5b).

To allow LAs and public heath leads to monitor the sexual and reproductive health of their population, PHE recently launched the Sexual and Reproductive Health Profiles. These profiles include interactive maps, charts and tables that provide a snapshot of sexual and reproductive health across a range of topics including teenage pregnancy, abortions, contraception, HIV, STIs and sexual offences. Wider influences on sexual health such as alcohol use, and other topics particularly relating to teenage conceptions such as education and deprivation level, are also included.

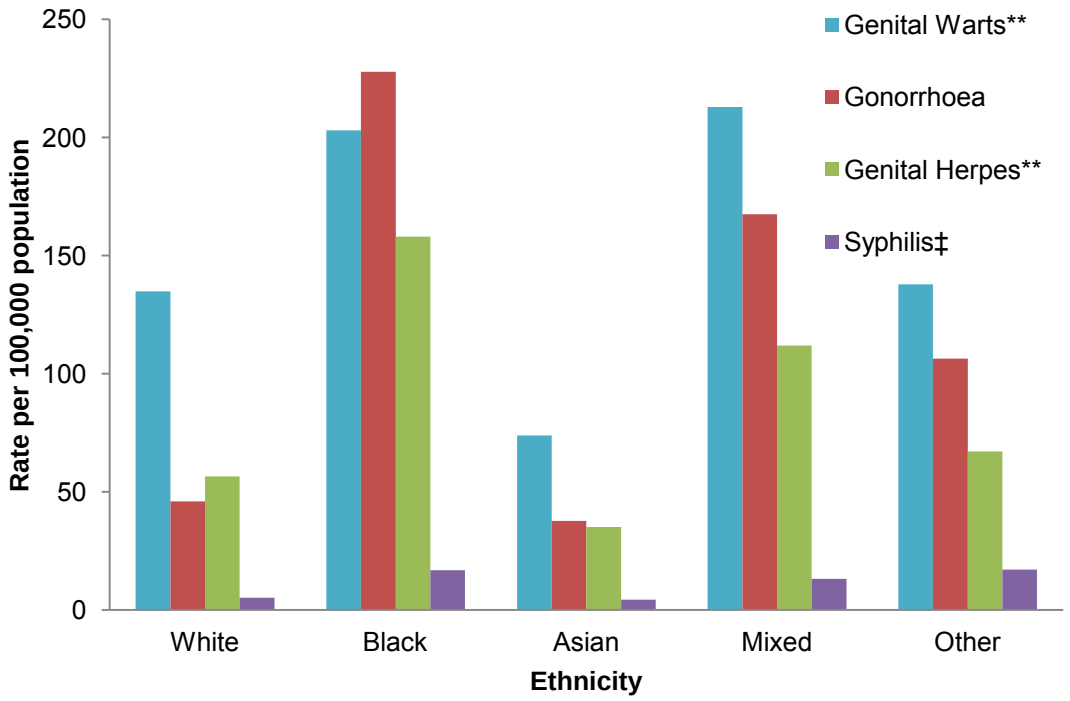
Figure 5. Rates of gonorrhoea diagnoses* by lower-tier Local Authority of residence, 2013



STI distribution by ethnicity

The highest rates of STI diagnoses were found among persons of black ethnicity (figure 6), and the majority of these cases were among persons living in areas of high deprivation, especially in urban areas (figures 5a and 5b) [14]. This high rate of STI diagnoses among black ethnic communities is most likely the consequence of a complex interplay of cultural, economic and behavioural factors [15]. Additionally, risk behaviours and STI epidemiology vary between black African and Caribbean ethnic groups [15, 16].

Figure 6. Rates of selected STI diagnoses* by ethnicity and STI, 2013, England



* Data from routine GUM clinic returns

** First episode

‡ Primary, secondary and early latent

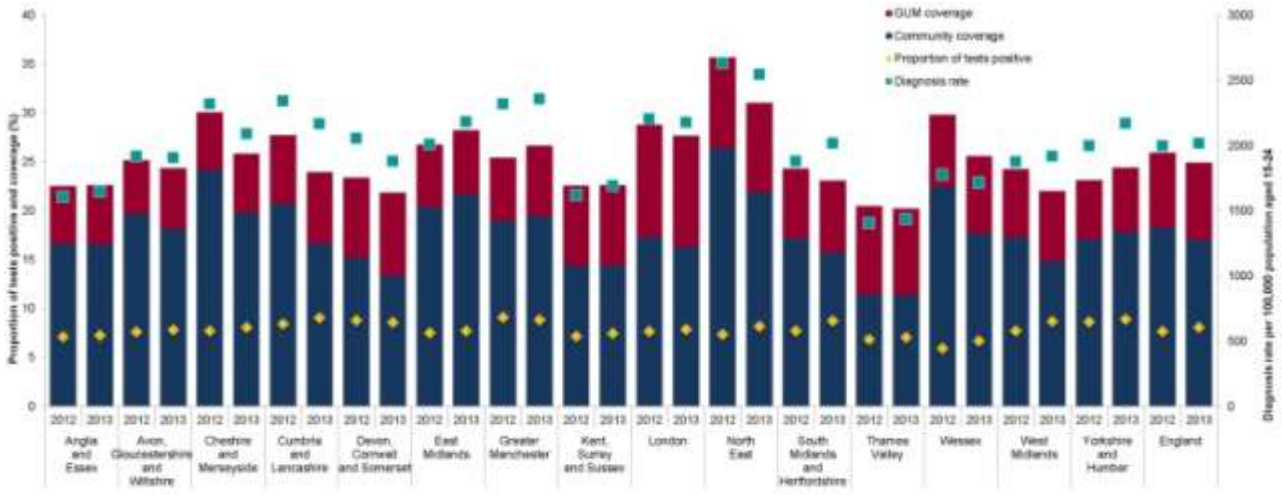
Genital Chlamydia trachomatis *tests and diagnoses in young people*

In 2013, over 1.7 million chlamydia tests were carried out in England among young people aged 15 to 24 years. A total of 139,237 chlamydia diagnoses were made among this age group, equivalent to a diagnosis rate of 2,016 per 100,000 population. Assuming one test per person, an estimated 35% of young females and 15% of young males were tested for chlamydia.

Chlamydia testing coverage, diagnosis rate and proportion testing positive varied by Public Health England (PHE) Centre area of residence (figure 7). The percentage of young people tested for chlamydia ranged from 20% in Thames Valley to 31% in North East. North East had the highest diagnosis rate per 100,000 population (2,545) while Thames Valley had the lowest (1,434). The proportion testing positive was relatively stable (range from 7% to 9%). Thus the variation in diagnosis rates between the areas mainly reflects the different testing rates. For all areas the majority of tests were carried out in community-based settings (including primary care) (56% to 77% of tests from all sources).

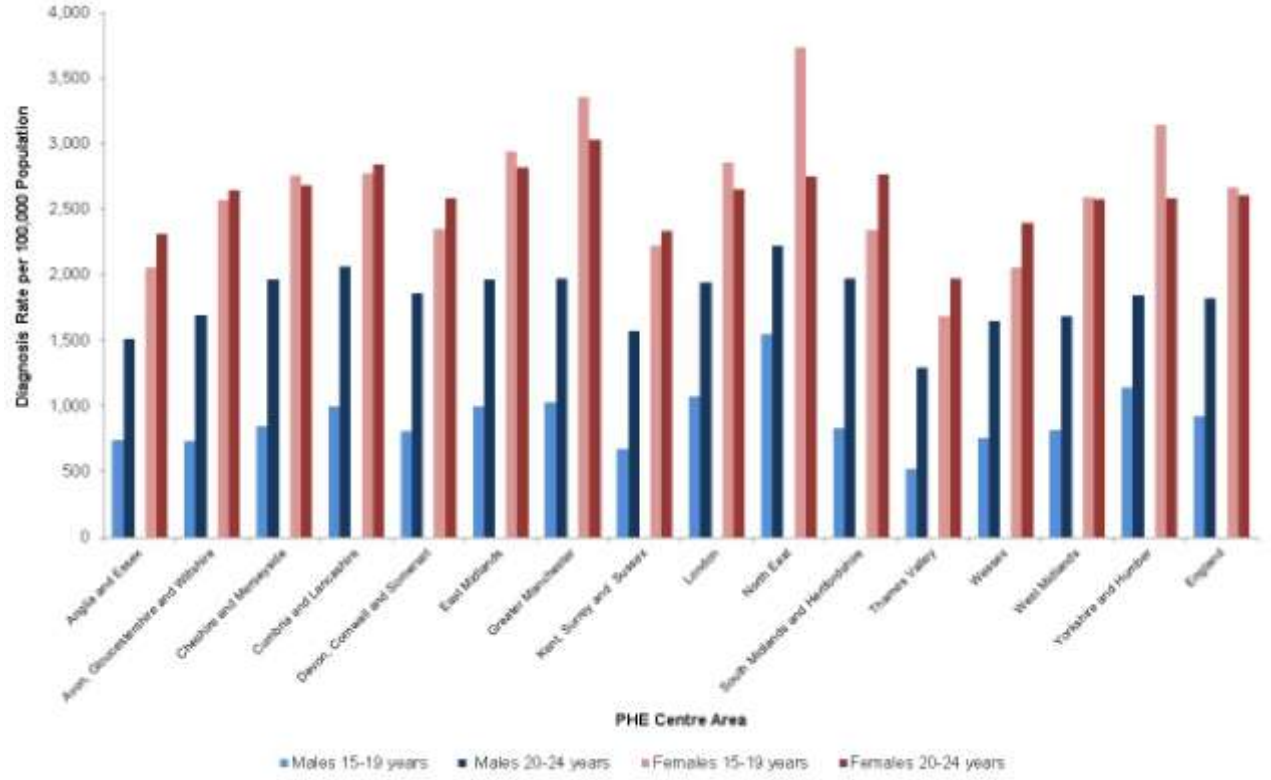
Despite many changes to service configuration during 2013, overall diagnosis and testing coverage rates have remained stable, and the proportion of total tests that are positive has increased from 7.7% in 2012 to 8.1% in 2013, indicating successful implementation of NCSP guidance on testing policy (figure 7).

Figure 7. Chlamydia testing coverage, diagnosis rates and proportion of tests positive among 15 to 24 year olds by testing venue and PHE Centre area, 2012 - 2013, England



Chlamydia diagnosis rates were higher in females than males across all areas (1.7 to 2.1 times higher), reflecting higher testing rates in females (figure 8). With the exception of North East, chlamydia diagnosis rates among young females did not vary greatly between those aged 15 to 19 years and those aged 20 to 24 years. However, diagnosis rates among males aged 20 to 24 years were 1.4 to 2.5 times higher than among males aged 15 to 19 years.

Figure 8. Chlamydia diagnosis rates among 15 to 24 year olds by gender, age-group and PHE Centre area, 2013, England

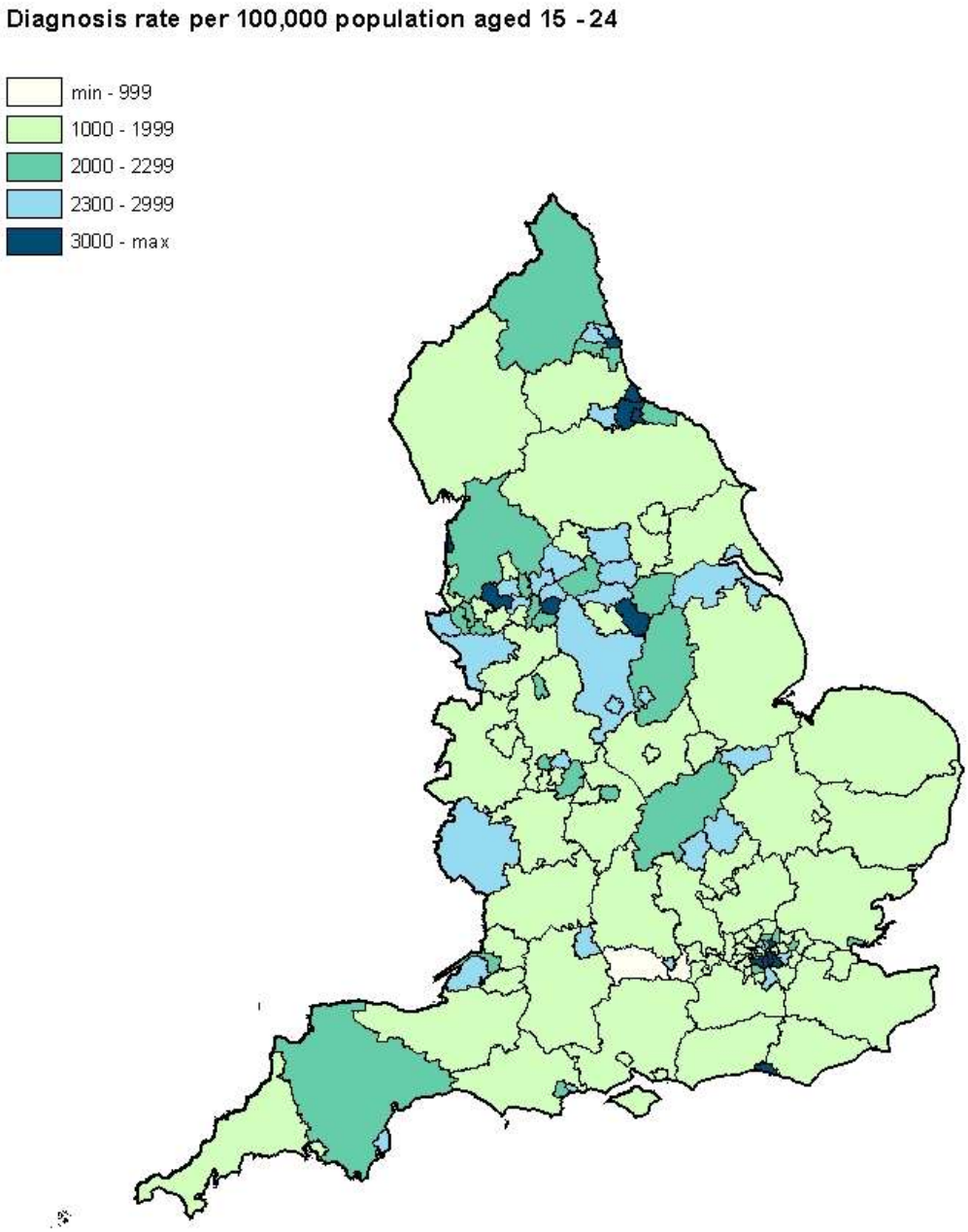


Rates of chlamydia diagnoses exhibit considerable geographic variation (figures 8 and 9). In 2013, the rate of chlamydia diagnoses by UTLA ranged from <560 (City of London) to 5,758 (Lambeth) per 100,000 population aged 15-24. Although the differences in diagnosis rate could be due to heterogeneity in behavioural risk for chlamydia, it may also be partially explained by differences in testing coverage (table 1) or, for a small number of UTLAs, data quality issues.

The Public Health Outcomes Framework (PHOF 2013-2016) recommends that local areas work towards achieving a chlamydia diagnosis rate among 15 to 24 year olds of at least 2,300 per 100,000 population*. Thirty percent of UTLAs achieved a diagnosis rate of at least 2,300 per 100,000 population among 15 to 24 year olds (table 1).

* Introduction of a new surveillance system allowed removal of duplicate diagnoses, resulting in a change to the 2012/13 Public Health Outcome Framework recommendation of ≥2,400 per 100,000 chlamydia diagnosis rate among 15 to 24 year olds.

Figure 9. Chlamydia diagnosis* rates among 15 to 24 year olds by Upper Tier Local Authority of residence, 2013, England



* Data from routine GUM clinic returns and community services

Table 1. Chlamydia testing coverage, and number and proportion of Upper Tier Local Authorities (UTLAs) achieving a chlamydia diagnosis rate among 15 to 24 year olds of at least 2,300 per 100,000 population by PHE Centre (PHEC) Area, 2013, England *

PHEC Area	Testing coverage (%)	Chlamydia diagnosis rate/100,000 population					
		≥ 2,300		2,000-2,299		< 2,000	
		No. of UTLAs	% of area	No. of UTLAs	% of area	No. of UTLAs	% of area
North East	31	7	58	4	33	1	8
London	28	8	24	7	21	18	55
East Midlands	28	3	38	1	13	4	50
Greater Manchester	27	6	60	3	30	1	10
Cheshire and Merseyside	26	2	22	3	33	4	44
Wessex	26	1	14	1	14	5	71
Avon, Gloucestershire and Wiltshire	24	2	29	1	14	4	57
Yorkshire and Humber	24	8	53	2	13	5	33
Cumbria and Lancashire	24	1	25	1	25	2	50
Anglia and Essex	23	1	14	1	14	5	71
Kent, Surrey and Sussex	23	1	17	0	0	5	83
South Midlands and Hertfordshire	23	2	33	1	17	3	50
West Midlands	22	2	14	4	29	9	57
Devon, Cornwall and Somerset	22	1	17	1	17	4	67
Thames Valley	20	1	13	0	0	7	88
England	**25**	**46**	**30**	**30**	**20**	**76**	**50**

* Data from routine GUM clinic returns and community services

Genital Chlamydia trachomatis *tests and diagnoses in all ages**

Since 2012 the Chlamydia Testing Activity Dataset (CTAD) has collected data on all NHS-commissioned chlamydia tests carried out in England. The NCSP targets young people aged 15 to 24 years but there are significant numbers of tests and diagnoses outside of this age range (table 2).

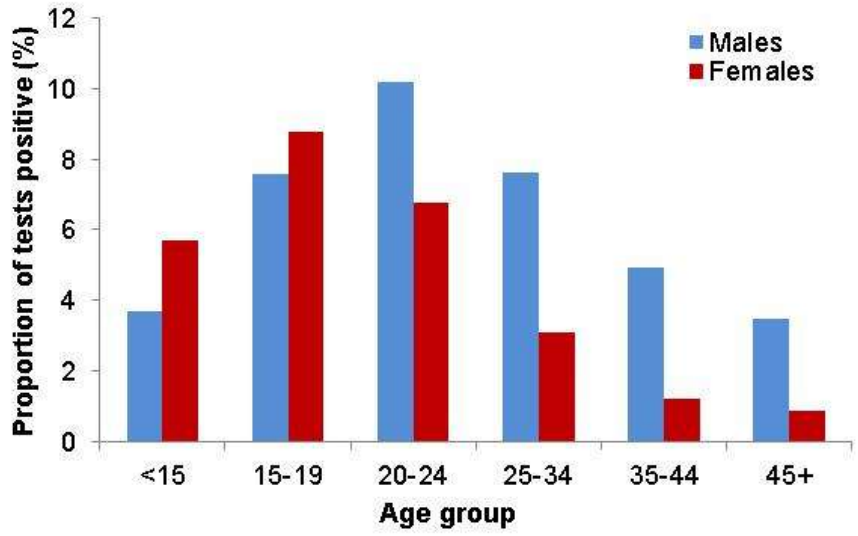
Table 2 Chlamydia tests, diagnoses, coverage and percentage tests positive by age group, 2013, England

Age group	Tests	Diagnoses	Proportion of tests positive (%)	Population coverage (%)
<15	21,181	1,141	5.4	0.2
15-19	698,822	58,741	8.4	21.3
20-24	1,024,114	80,496	7.9	28.3
25-34	1,034,146	46,547	4.5	14.2
35-44	471,334	10,719	2.3	6.5
45+	279,789	5,122	1.8	1.2
Unknown	4,170	433	10.4	-
Total	**3,533,468**	**203,199**	**5.8**	**6.6**

* Data from routine GUM clinic returns and community services

Coverage in females is consistently greater than in males across all age groups but the proportion of tests that are positive is greater in males for age groups 20-24 and above (figure 10). The proportion of tests positive for males aged 25 to 35 years was 7.6%, equal to the proportion for males aged 15 to 19 years.

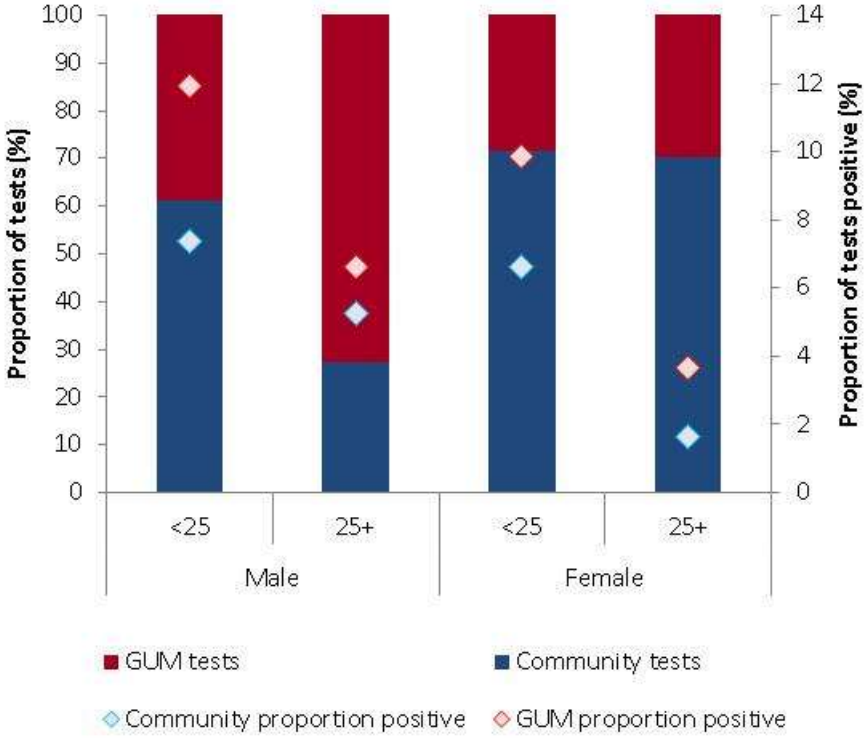
Figure 10. Proportion of chlamydia tests positive by age group and gender, 2013, England*



* Data from routine GUM clinic returns and community services

The proportion of tests within a GUM setting is similar for females under and over 25 years-old but for males the proportion is greater in those over 25 (73% compared to 39%) (figure 11). This likely reflects the difference in testing practices between males and females of older age groups.

Figure 11. Chlamydia testing by setting and proportion of tests positive, by age group and gender, 2013, England



Discussion and conclusions

Despite a small decrease compared to 2012, there were approximately 450,000 STI diagnoses made in England in 2013. Genital chlamydial infection was the most commonly diagnosed STI, accounting for 47% of diagnoses. New diagnoses of gonorrhoea continued the sharp rise seen in recent years, exceeding 29,000 cases in 2013. More recent diagnosis figures may be a truer reflection of burden as more persons are being tested with more sensitive NAATs. Notwithstanding these improvements in testing, the rise is diagnoses suggests high levels of gonorrhoea transmission. This is a cause for concern given the emergence of decreased susceptibility to frontline antimicrobials used for treating gonorrhoea and the depletion of effective treatment options [17].

Of particular concern is the continuing rise in STI diagnoses among MSM, which may be due to ongoing high levels of unsafe sex among MSM. Furthermore, serosorting, the practice of engaging in unprotected sex with partners believed to be of the same HIV status, increases the risk of STI and hepatitis infection and, if HIV negative, has a high risk of HIV infection as 18% of MSM are unaware of their infection [18].

There was notable variation in the chlamydia diagnosis rate among 15 to 24 year-olds by geographic area, largely reflecting rates of testing. Areas with diagnosis rates below the new PHOF recommended indicator of 2,300 per 100,000 population should consider means to promote chlamydia screening across all population groups to better detect and control chlamydia infections. Local areas should focus on embedding chlamydia screening for 15 to 24 year-olds into a variety of community settings including primary care and sexual and reproductive health services, emphasise the need for repeat screening annually and on change of sexual partner, as well as the need for re-testing after a positive diagnosis within three months of initial diagnosis [19]; and ensure treatment and partner notification standards are met [20].

There is considerable inequality in the distribution of STIs across the population. Health promotion and education remain the cornerstones of STI prevention, through improving risk awareness and encouraging safer sexual behaviour. Prevention efforts, such as greater STI screening coverage and easy access to sexual health services, with a focus on groups at highest risk such as young people, persons of black ethnicity and MSM, are also vital to controlling transmission. Men who have sex with men should have an HIV and STI screen at least annually, or every three months if having unprotected sex with new or casual or partners. Consistent and correct condom use, reducing the number of sexual partners and the avoidance of overlapping sexual relationships all reduce the risk of being infected with an STI. Effective commissioning of high quality sexual health services, as highlighted in the recently published Framework for Sexual Health Improvement in England [21], will promote delivery of these key messages.

Resources on the PHE website

Further STI data are available on the PHE website in tables (www.hpa.org.uk/stiannualdatatables, http://www.chlamydiascreening.nhs.uk/ps/data.asp) and in interactive maps on the recently launched *Sexual and Reproductive Health Profiles* (http://fingertips.phe.org.uk/profile/sexualhealth). The *Sexual and Reproductive Health Profiles* are presented using the Fingertips web tool.

Further information on the GUMCADv2 and CTAD surveillance systems is available at www.hpa.org.uk/gumcad and http://www.hpa.org.uk/sexualhealth/ctad, respectively.

Further information on the Gonoccocal Resistance to Antimicrobials Surveillance Programme (GRASP) Action Plan for England and Wales is available at http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1317138215954.

Statistical notes on the data analysis

1. GUM clinic data covering diagnoses since 2009 were collected through a new electronic surveillance system, the Genitourinary Medicine Clinic Activity Dataset (GUMCADv2). During years prior to this, data were collected on an aggregated, paper-based form, the KC60 statistical return. Unlike KC60 surveillance, GUMCADv2 enables errors in data coding submitted by clinics to be identified and corrected. The net effect has been to reduce slightly the number of diagnoses reported, as duplicates can be removed. To enable fair comparisons of trends in STI diagnoses reported over time using these two surveillance systems, numbers of diagnoses reported through KC60-based surveillance in years prior to 2009 were adjusted down. The adjustment was calculated using the estimated percentage difference in diagnoses reported through GUMCADv2 and KC60 for the same calendar quarters in 2008 and 2009. This was possible as both systems were run in parallel during these years.

2. Males reported with an unknown sexual orientation have been excluded from the heterosexual and MSM analyses. Females reported with an unknown sexual orientation have also been excluded from heterosexual analyses.

3. Several changes were made in 2012 to the way chlamydia data are reported. The Chlamydia Testing Activity Dataset (CTAD) is a universal disaggregate dataset that comprises data on all NHS and LA or NHS-commissioned chlamydia testing carried out in England. CTAD replaced the NCSP core data return and the non-NCSP non-GUM aggregate data return. Statistical notes specific for chlamydia data are summarised below:

- From 2012, total chlamydia diagnoses reported include community chlamydia data from all age-groups, and not solely the NCSP target age group of 15 to 24 year olds (as in previous years).
- From 2012, all chlamydia cases presenting to GUM clinics that were previously diagnosed at other services are no longer included in the chlamydia diagnosis totals, in order to decrease double counting in the data. As a result of this, the recommended level for the PHOF indicator chlamydia diagnosis rate was revised down from 2,400 to 2,300 per 100,000 population in 15 to 24 year olds.
- Data include chlamydia tests and diagnoses among people accessing services located in England who are also resident in England.
- Data include tests where sex is reported as male, female, and unknown/unspecified.
- Data includes all screening tests, diagnostic tests and tests on contacts.

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