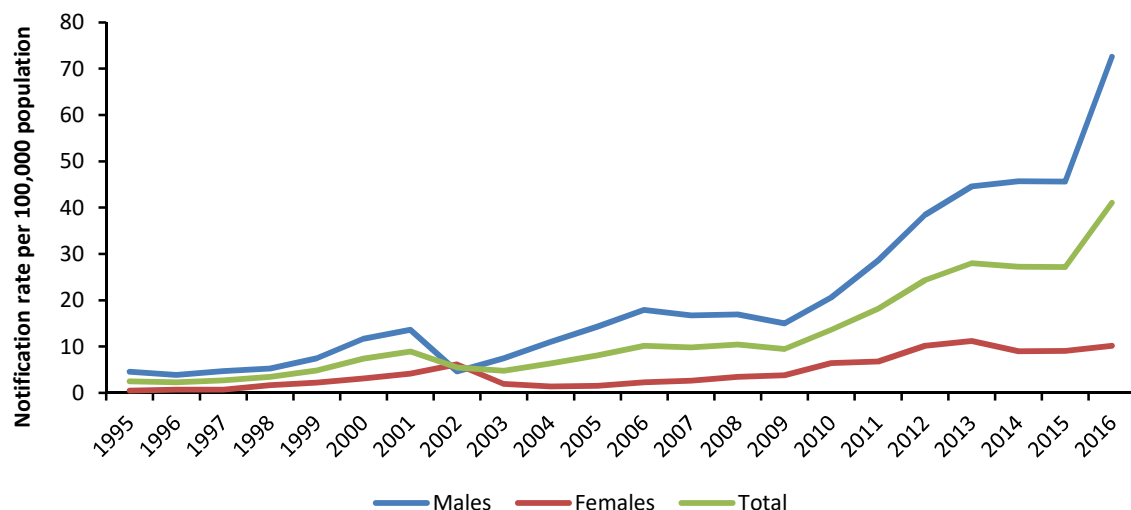


Gonorrhoea in Ireland, 2016

Key Points

- 1,957 cases of gonorrhoea were reported in Ireland in 2016
- There was a 51% increase in gonorrhoea notifications in 2016, with a notification rate of 41.1 per 100,000 population, compared to 27.2 per 100,000 in 2015
- 87% of the notifications were in males and 12% were in females
- There was a 59% increase in notifications among males and an 11% increase in notifications among females (males 45.7/100,000 in 2015 to 72.6/100,000 in 2016; females 9.1/100,000 in 2015 to 10.1/100,000 in 2016)
- Gonorrhoea mainly affected young people (aged 20-29 years)
- Mode of transmission was known for 64% of cases;
 - Where known:
 - 67% of cases were reported among men who have sex with men (MSM)
 - 33% of cases were reported as heterosexual
- 511 (26%) cases diagnosed with gonorrhoea were also diagnosed with another STI in 2016, including 17% who also had Chlamydia and 2% who were newly diagnosed with HIV
- The highest age standardised notification rate was in HSE East (73.0/100,000), which was significantly higher than the national notification rate, while the rates in all other HSE areas were significantly lower than the national rate

Figure 1: Notification rates of gonorrhoea by year of notification, sex and overall national total, 1995 to 2016



Background

Since 1948, gonorrhoea has been a notifiable sexually transmitted infection (STI) in Ireland¹. From early 2013, case based information on laboratory and clinical notifications have been collated in the Computerised Infectious Disease Reporting system (CIDR). Prior to this, information on gonorrhoea was collected nationally on an aggregate basis, from STI clinics and from general practitioners (GPs) via Departments of Public Health.

National data for 2016

In 2016, a total of 1,957 cases of gonorrhoea were reported in Ireland, giving a notification rate of 41.1 per 100,000 population. This is a 51% increase on the notification rate in 2015 (27.2 per 100,000). There has been more than a fourfold increase in the rate of gonorrhoea notifications since 2009. Figure 1 shows the trend in gonorrhoea notifications in males and females from 1995 to 2016. The increase in the national gonorrhoea notification rate in 2016 can mainly be attributed to a 59% increase in notifications among males. A summary of the key data is presented in Table 1.

Table 1: Summary of gonorrhoea cases in Ireland, 2016 (n=1,957)

Number of cases		1,957
Notification rate		41.1/100,000
Sex	Males	1,709 (87.3%)
	Females	244 (12.5%)
	Unknown	4 (0.2%)
	Male-to-female ratio	7.0
Age*	Median age (range)	27 years (15 – 81 years)
*excludes 4 cases where gender was unknown & those ≤14 years	Median age female heterosexual	20 years
	Median age male heterosexual	22 years
	Median age MSM	29 years
	Median age unknown mode of transmission	27 years
Age-gender specific rate**	Highest overall	192/100,000 (20-24 years)
**excludes 4 cases whose gender and/or age was unknown	Highest among males	323/100,000 (20-24 years)
	Highest among females	63/100,000 (15-19 years)
Mode of transmission	Men who have sex with men	839
	<i>% where known</i>	67.2%
	Male heterosexual	169
	<i>% where known</i>	13.5%
	Female heterosexual	239
	<i>% where known</i>	19.1%
	Unknown mode of transmission	708
	<i>% of total</i>	36.2%
Multiple STI infections	All STIs	511 (26.1%)
	Most common: chlamydia	337 (17.2%)

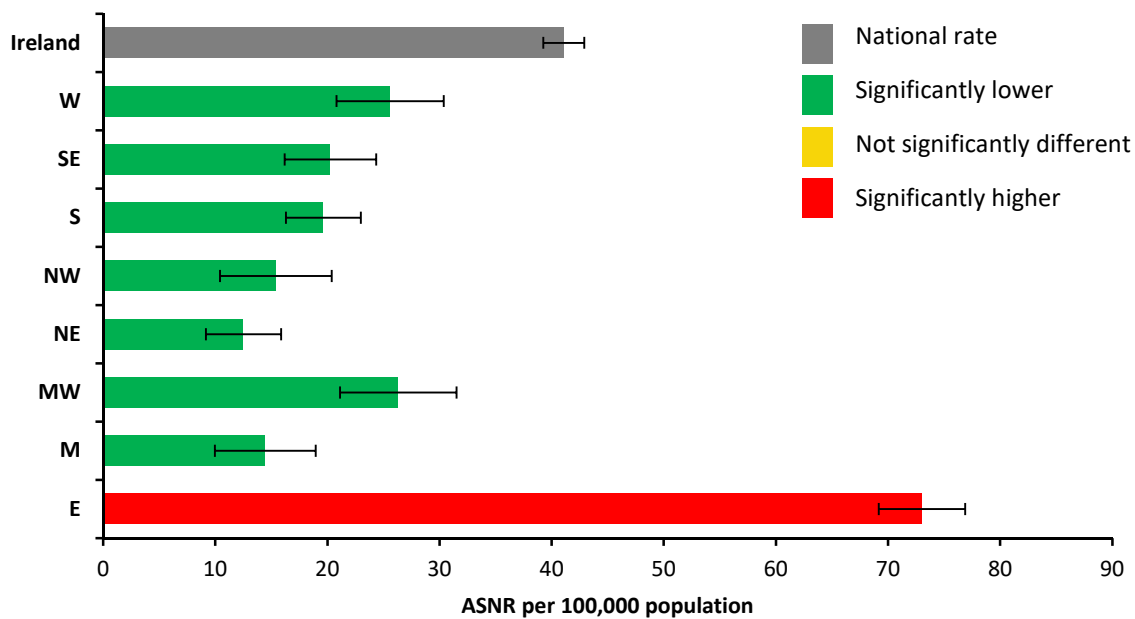
HSE area of residence

The highest age-standardised notification rate (ASNR) was in HSE East (73.0/100,000; 95% CI 69.2 – 76.9), which is significantly higher than the national rate (41.1/100,000; 95% CI 38.3 – 42.9). All other HSE areas are significantly below the national rate (Figure 2).

Figure 2: Age-standardised notification rate and 95% confidence intervals of gonorrhoea by HSE area* compared with national rate, 2016 (n=1,956)**

*see technical note 5 for list of counties covered by each HSE area

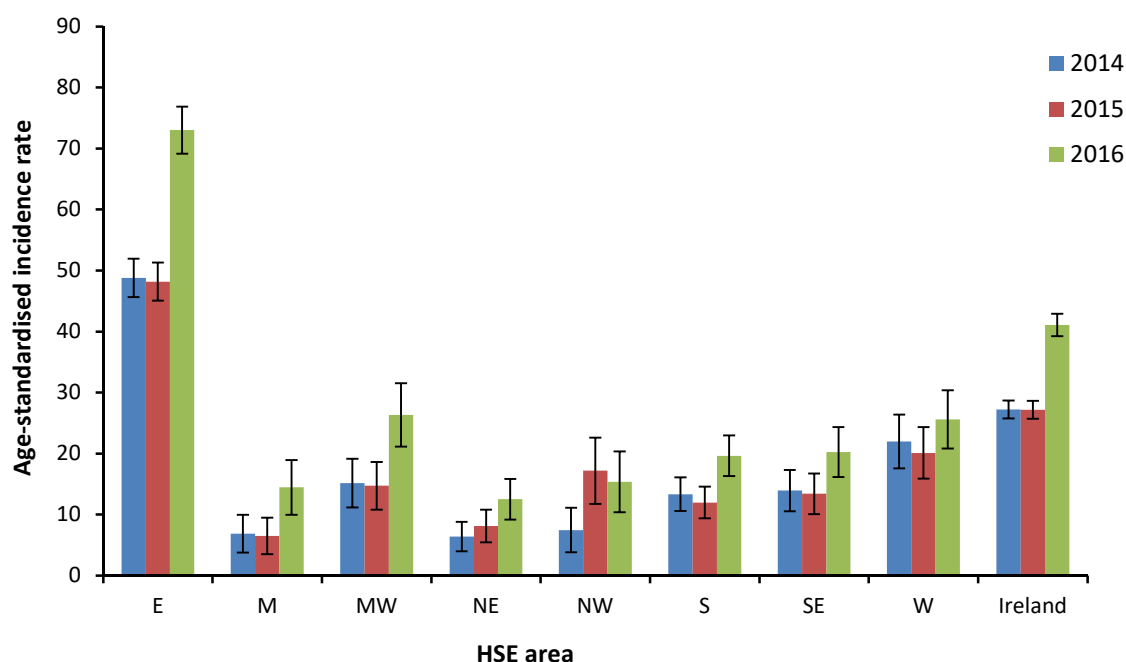
** excludes 1 case of unknown age



The rate of gonorrhoea notifications increased slightly in all areas in 2016, with the exception of HSE Northwest, where there was a slight decrease in notifications between 2015 and 2016 (17.2/100,000 in 2015 to 15.4/100,000 in 2016). Statistically significant increases in gonorrhoea notifications occurred in HSE East, Midlands, Midwest and South in 2016, compared to 2015 (Figure 3).

Figure 3: Age-standardised notification rate by HSE area, 2014-2016*

*Excludes 1 case of unknown age in 2016



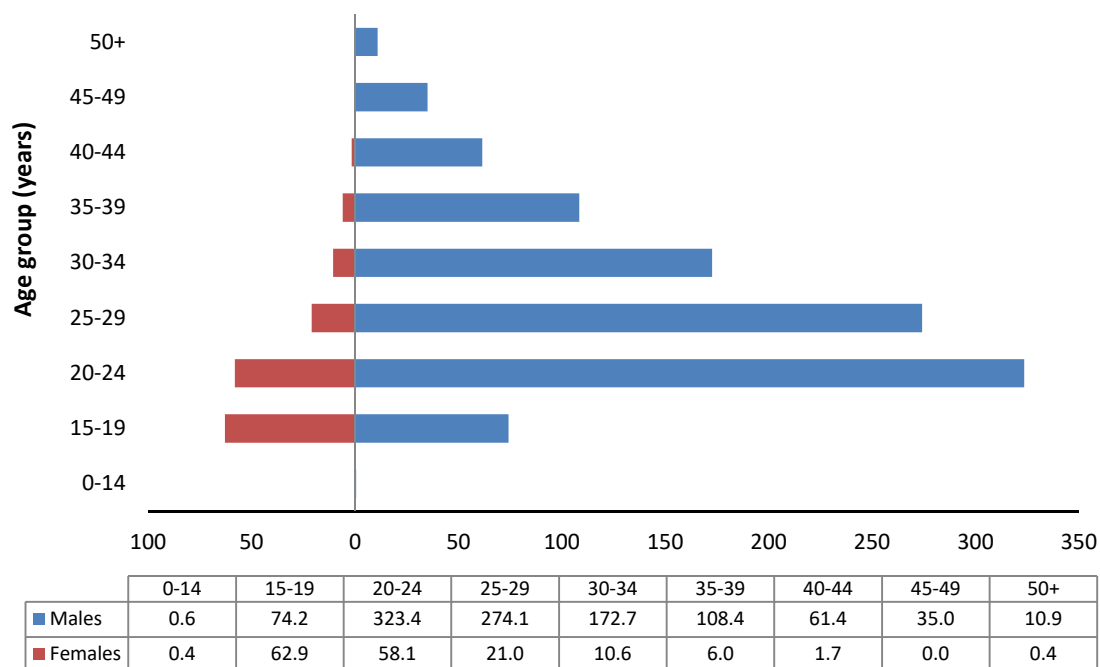
Age and Sex

In 2016, 1,709 (87%) gonorrhoea notifications were among males and 244 (12%) notifications were among females. Gender was unknown for 4 cases. Almost one third (27%, n=524) of gonorrhoea cases notified were among those aged between 20 and 24 years old and 65% (n=1,273) were aged between 20 and 35 years old. This trend is unchanged from 2015 in which 67% of cases were reported in young people, aged between 20 and 35 years old. The highest rate among males in 2016 was in the 20-24 year old age group followed by the 25-29 year old group. The highest rate among females in 2016 was in the 15-19 year old age group followed by the 20-24 year old age group (Figure 4). This represents a shift in the trend among females since 2015, in which the 20-24 year old age group had the highest number of notifications, followed by the 15-19 year olds.

The median age of cases (excluding those ≤ 14 years) was unchanged from 2015 at 27 years (range 15 to 81). The median age of male cases was, again unchanged from 2015 at 28 years (range 15 to 81 years), and among female cases median age was 20 years (range 16 to 76 years), a decrease from a median age of 22 years among females in 2015.

Figure 4: Gonorrhoea notification rate per 100,000 by age group and sex, 2016 (n=1,953*)

*Excludes 1 case of unknown age and 4 cases of unknown gender



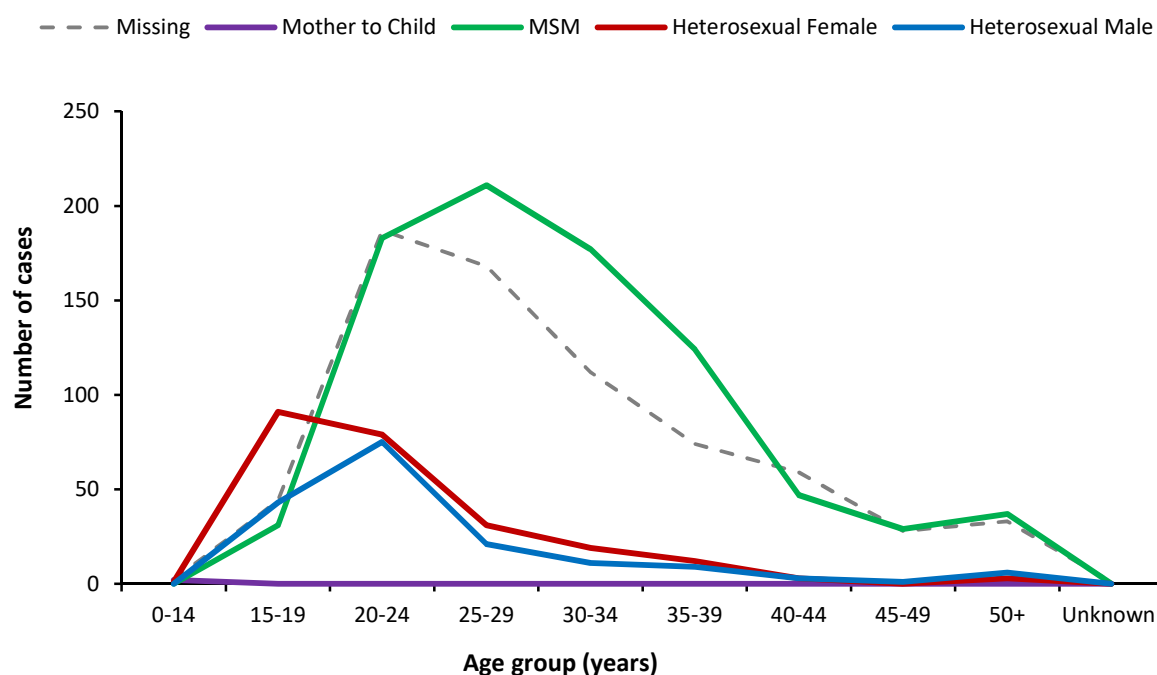
The rate of gonorrhoea notifications in females increased by 11% from 9.1/100,000 in 2015 to 10.1/100,000 in 2016. In males the rate increased by 59% from 45.7/100,000 in 2015 to 72.5/100,000 in 2016 (Figure 1). The male-to-female ratio increased from 4.9 in 2015 to 7.0 in 2016. Across all HSE areas, the male-to-female ratio ranged from 3.0 in HSE Northeast, Southeast, Midwest, Northwest, and West to 11.0 in HSE East.

Mode of transmission

Mode of transmission was available for 64% (n=1249) of gonorrhoea notifications in 2016. This is an increase on the completeness of mode of transmission data in 2015, which was available for 57% of cases (n=739). Of the cases where mode of transmission was known in 2016, 67% (n=839) were reported as MSM (43% of total cases), an increase from 56% (n=413) of cases where mode of transmission was known in 2015 (32% of total cases). Mode of transmission was reported as heterosexual for 33% of notifications where mode of transmission was available in 2016 (n=408; 239 females and 169 males) (21% of total cases), a decrease from 44% of notifications where mode of transmission was available (n=326; 218 females and 108 males) in 2015 (25% of total cases). There were two cases of mother to child transmission in 2016.

MSM tended to be older than heterosexuals, with a median age of 29 years, compared to 21 years among heterosexuals (males 22 years and females 20 years). The median age of MSM in 2016 was unchanged from 2015, however the median age of heterosexuals had decreased compared to a median age of 23 in 2015 (males 24 and females 22). Those with an unknown mode of transmission in 2016 (n=708; 699 males, 5 females and 4 unknown gender) had a median age of 27 years (Figure 5).

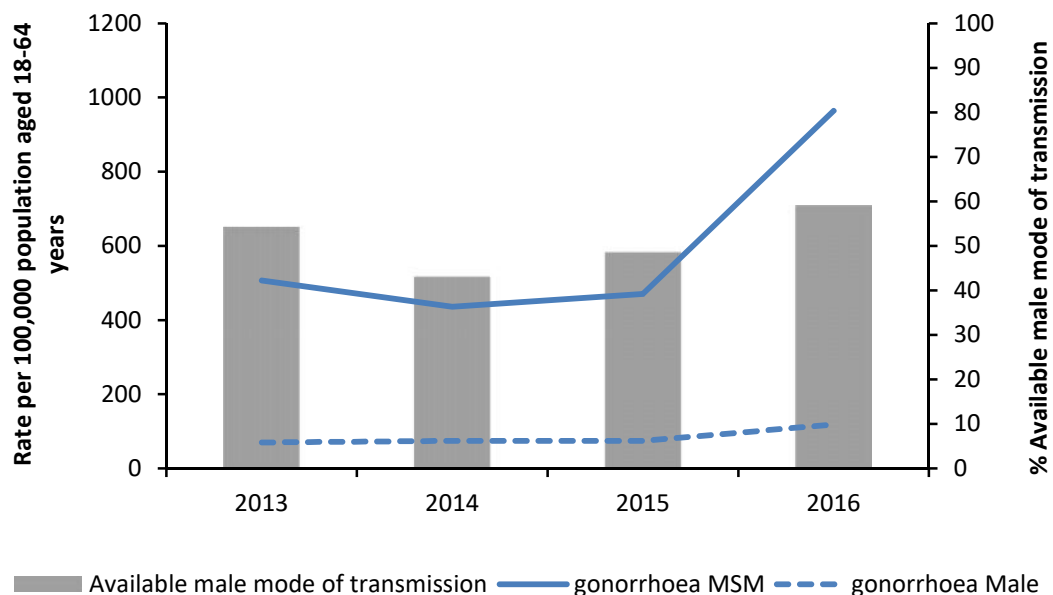
Figure 5: Gonorrhoea notifications by age group and mode of transmission, 2016 (n=1,957)



The rate of gonorrhoea notifications in all males (aged 18-64 years) remained stable, between 2013 and 2015 (70.3/100,000 – 74.2/100,000). In 2016 the rates of notification of gonorrhoea among males increased to 118.0/100,000 population. Among MSM (aged 18-64 years) the rate of gonorrhoea notifications increased from 470.5/100,000 in 2015 to 964.0/100,000 MSM population in 2016, having remained quite stable from 2013 – 2015. More complete data on mode of transmission may have contributed to the increase in notifications among MSM, however the 105% increase in MSM notifications in 2016 compared to 2015 cannot be fully attributed to the increase in completeness of mode of transmission data (Figure 6).

Figure 6: Gonorrhoea notification rates in all males compared to MSM aged 18-64*, 2013 - 2016

*See technical note 7 for information on calculation of MSM population data



These data should be interpreted with caution, however, given the high level of missing data. Mode of transmission was unknown for 36% (n=708) of cases in 2016. Additionally, the completeness of data on MSM transmission may be a reporting artefact, as this mode can be assigned for some cases for surveillance purposes, based on attendance at MSM-specific clinics.

Region of birth

Region of birth was available for 31% (n=599) of gonorrhoea notifications in 2016 (Table 2). This field was slightly more complete than in 2015 (29%).

Table 2: Region of birth of patients with gonorrhoea notifications, 2016 (n=599)

Region of birth	N	%
Ireland	441	73.6
Latin America & North America	72	12.0
Central Europe	31	5.2
Western Europe	25	4.2
Asia & Australasia	13	2.2
Africa & Middle East	10	1.7
Eastern Europe	7	1.2
Total	599	

Site of infection

Specimen type was used as a proxy for site of infection and was available for 86% (n=1,674) of cases. However, laboratories typically only report the first site of infection to CIDR, and so specimen type doesn't represent all the cases or sites of infection.

Genital and pharyngeal sites were the most frequently first reported sites of infection among males (32%, n=547 and 28%, n=467 respectively). Pharyngeal infections were the first reported site in 26% of all gonorrhoea cases in 2016, which has important implications for treatment of gonorrhoea as the pharynx may be a reservoir for antimicrobial resistant gonorrhoea². The third most common site of infection was anorectal (24%, n=468), of which 99% (n=464) were males, compared to 1% (n=4) anorectal infections among females. Eleven of the anorectal gonorrhoea infections reported among males were reported as a second site of infection. Eye infections were reported for 10 cases (7 males and 3 females).

Multiple STI infections

Three percent (n=57) of all cases were diagnosed with two or more episodes of gonorrhoea in 2016, all of which were males. Eleven percent (n=217) of cases diagnosed in 2016 also had a gonorrhoea diagnosis in the previous 3 years (2013 – 2015).

In addition to a diagnosis of gonorrhoea in 2016, 27% (n=459) of males and 21% (n=51) of females were diagnosed with at least one other STI in the same year. Chlamydia (n= 337, 17%) was the additional STI most frequently reported. The large volume of notifications in HSE East and the use of more automated processes for notifying Chlamydia infections in CIDR, which does not allow for de-duplication of cases, may have contributed to an underestimate of *Chlamydia trachomatis* infections among cases with gonorrhoea in HSE East.

Other STIs diagnosed in patients with gonorrhoea in 2016 included syphilis (n=74, 4%), HIV (n=46, 2%), LGV (n=22, 1%) and genital herpes simplex (n=17, 0.8%). There were 13 cases of hepatitis C (0.7%) and one case each of hepatitis B and trichomoniasis among patients diagnosed with gonorrhoea.

Patient type

Patient type (reflecting the service at which the patient was diagnosed) was available for 94% of gonorrhoea cases in 2016. STI clinics diagnosed 62% (n=1,218) of cases, of which 93% (n=1,127) were males. Females were more likely to attend general practices as 50% of female cases were

diagnosed by GPs, compared to 28% of cases among males, while 37% of female cases were diagnosed by STI clinics, compared to 66% of male cases (Table 3).

Table 3: Gonorrhoea notifications by gender and patient type, 2016 (n=1,957)

Patient Type	Male		Female		Unknown		Total	
	N	%	N	%	N	%	N	%
Emergency department	6	0.4	2	0.8	0	0	8	0.4
General practice	480	28.1	122	50.0	3	75.0	605	30.9
Hospital (inpatient)	5	0.3	7	2.9	0	0	12	0.6
STI clinic (outpatient)	1127	65.9	90	36.9	1	25.0	1218	62.6
Other	51	3.0	16	6.6	0	0	67	3.4
Unknown	40	2.3	7	2.9	0	0	47	2.4
Total	1709		244		4		1957	

Discussion

The national data for 2016 shows there was a 51% increase in the overall gonorrhoea notification rate in Ireland in 2016 (41.1/100,000 compared to 27.2/100,000 in 2015). The increase can largely be attributed to an increase in cases among males, as the notification rate for males in 2016 increased by 59%, while among females the notification rate increased by only 11% compared to 2015, resulting in an increase in the male-to-female ratio in 2016. Of cases where mode of transmission data was available 67% were MSM, indicating that the high gonorrhoea notification rate among males may also be attributed to a large number of cases among MSM.

There was no change in median age of MSM cases, compared to 2015. Furthermore, there was no change in regional distribution of MSM cases as 80% of cases reported as MSM in 2016 were notified in HSE East, compared to 81% of cases in 2015. Between 1% and 6% of cases were reported as MSM in other HSE areas in 2016.

The main age groups affected by gonorrhoea in 2016 were the 20-24 year olds, followed by the 25-29 year olds and the median age remained unchanged from 2015. Females with gonorrhoea tended to be younger in 2016, however, with the 15-19 year old age group most frequently affected and a decrease in median age compared to 2015. There was a slight decrease in gonorrhoea notifications among heterosexuals observed in 2016, compared to 2015. Cases notified as heterosexual also tended to be younger than those among MSM.

In addition to a diagnosis of gonorrhoea, 27% of males and 21% of females were diagnosed with another STI in 2016 and 3% of all male cases were diagnosed with at least 2 episodes of gonorrhoea more than 3 months apart in 2016. These data suggest ongoing high-levels of gonorrhoea and other STI transmission and continued sexual risk-taking behaviours.

Similarly to Ireland, Australia have reported a 63% increase in gonorrhoea notifications, from 62 to 101/100,000 population between 2012 and 2016³, while in the U.S.A. there has been a 19% increase in the rate of gonorrhoea notifications from 123/100,000 in 2015 to 145.8/100,000 in 2016⁴.

In Scotland however, gonorrhoea notifications have stabilised (at 67/100,000 in both 2015 and 2016)⁵, while in England notifications of gonorrhoea have decreased 14% (from 75.3/100,000 in 2015 to 66.2/100,000 in 2016). Almost half (49%) of the gonorrhoea cases in England occurred among MSM, representing a 22% decrease compared with 2015 figures⁶. The decreases in gonorrhoea cases in England are promising and reflect the success of sexual health promotion and education in London and elsewhere in the country⁷; however the sustained high rates of gonorrhoea infection still remain a concern.

Completeness of mode of transmission data was improved in 2016 but these data were unavailable for 36% of cases and so continued improvements in the completeness of mode of transmission data are essential to more accurately describe the national burden of gonorrhoea and to inform target interventions. Close surveillance of gonorrhoea trends is especially important, as the number of gonorrhoea infections with resistance to first-line antibiotics is a growing threat. Availability of mode of transmission information could inform laboratory policies, such as selective culturing from specimens and antimicrobial susceptibility testing of isolates from high risk groups, to prevent the transmission of multi-drug resistant strains. New national guidelines for the prevention and treatment of gonorrhoea and minimising the impact of antimicrobial resistant *Neisseria gonorrhoeae* were recently issued⁸.

Targeted prevention and health promotion measures, introduced in response to the outbreak of STIs among MSM, should continue. In addition, combinations of key interventions, such as access to condoms, comprehensive HIV and STI testing and treatment, and health promotion, should be utilised to the highest levels, to improve the sexual health of MSM and reduce gonorrhoea, HIV and other sexually transmitted infections⁹.

Further information

Data tables for gonorrhoea are available on the HPSC website at <http://www.hpsc.ie/a-z/hivstis/sexuallytransmittedinfections/publications/stireports/>

Keep up to date with the weekly HIV and STI report that is also available on the HPSC website at <http://www.hpsc.ie/a-z/hivstis/sexuallytransmittedinfections/publications/stireports/stiweeklyreports/>.

For more information on antimicrobial resistant gonorrhoea see the HPSC website at <http://www.hpsc.ie/a-z/hivstis/sexuallytransmittedinfections/gonorrhoea/amrgonorrhoea/>.

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Technical Notes

1. Data are analysed by date of notification in CIDR
2. Data for this report were extracted from the STI aggregate database (1995-2012), CIDR (2016) on 10th August 2017 and CIDR (2014/2015) on 26th October 2017, and were correct at the time of publication.
3. Please note that information from previous years is updated on an ongoing basis in CIDR, and so information from previous years represents our current understanding and most up to date data as of 26th October, 2017, and may not correspond exactly with what was reported in previous annual reports. Similarly, data for 2016 may be updated further in due course and will be reported on in subsequent annual reports.
4. Percentages are rounded up in the text and provided to one decimal place in the tables.
5. The counties covered by each HSE area are as follows: HSE East: Dublin, Kildare & Wicklow; HSE Midlands: Laois, Longford, Offaly & Westmeath; HSE Midwest: Clare, Limerick & N. Tipperary; HSE Northeast: Cavan, Louth, Meath & Monaghan; HSE Northwest: Donegal, Leitrim & Sligo; HSE South: Kerry & Cork; HSE Southeast: Carlow, Kilkenny, S. Tipperary, Waterford & Wexford; HSE West: Galway, Mayo & Roscommon.
6. Age-standardised incidence rates were calculated using the direct method in which the national population was taken as the standard population. Population data were taken from Census 2016 from the Central Statistics Office. Data were aggregated into the following age groups for the analysis: 0-4 years, 5-9 years, 10-14 years, 15-19 years, 20-24 years, 25-34 years, 35-44 years, 45-54 years, 55-64 years and ≥65 years.

7. For calculation of the rate of gonorrhoea notifications per 100,000 MSM population, the MSM population was calculated as 6% of the Irish male population aged between 18 and 64 years (Census 2016), as estimated by the Healthy Ireland survey, which is a nationally representative survey¹⁰.

Acknowledgements

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