

Annual Epidemiological Report

October 2018

Gonorrhoea in Ireland, 2017

Key Facts

- There were 2,249 notifications of gonorrhoea in Ireland in 2017
- The notification rate increased by 15% to 47.2 per 100,000 in 2017 compared with 41.0 per 100,000 in 2016, this follows a 51% increase in rate between 2015 and 2016
- 81% of notifications were in males and 19% in females
- Notifications in males increased by 7% to 77.6/100,000 in 2017, from 72.5/100,000 in 2016
- Notifications in females increased by 71%; a notification rate of 17.3/100,000 in 2017 compared to 10.1/100,000 in 2016
- Overall 39% of notifications were in young people (15-24 years) in 2017; an 18% increase compared with 2016
- Where mode of transmission was known (67% of all notifications)
 - 60% were among men who have sex with men (MSM)
 - 40% were heterosexual
- The highest age-standardised notification rate (ASNR) in 2017 was in HSE East (79.9/100,000), which was significantly higher than the national rate
- Among patients diagnosed with gonorrhoea in 2017, there were 523 additional notifications of another STI and 2% were newly diagnosed with HIV in 2017, while a further 3% had been previously diagnosed with HIV

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Introduction

Background

Gonorrhoea, caused by the bacterium *Neisseria gonorrhoeae*, is the second most commonly reported sexually transmitted infection (STI) in Ireland. Gonorrhoea may cause genital, rectal, pharyngeal and conjunctival infections and may often be asymptomatic, particularly in females. Gonorrhoea increases the risk of HIV transmission and may lead to fertility problems if not treated correctly. The rise in antimicrobial resistant gonorrhoea, that has been seen globally, highlights the need for effective gonorrhoea prevention strategies (1).

Gonorrhoea has been a notifiable disease in Ireland since 1948 (2). From early 2013, case-based information on laboratory and clinical notifications have been collated in the Computerised Infectious Diseases Reporting system (CIDR). Prior to this, information on gonorrhoea was collected nationally on an aggregate basis, from STI clinics and general practitioners (GPs) via Departments of Public Health.

Epidemiology

There were 2,249 notifications of gonorrhoea in Ireland during 2017, an increase of 15% compared with 2016 when 1,953 cases were notified. The notification rate (NR) increased to 47.2 per 100,000 population in 2017 from 41.0 per 100,000 population in 2016. This followed a 51% increase in the notification rate between 2015 and 2016 and continues the increasing trend since 2009 (Figure 1). A summary of the key data for 2017 is presented in Table 1.

Figure 1. Trend in notification rate of gonorrhoea by sex in Ireland, 1995 – 2017

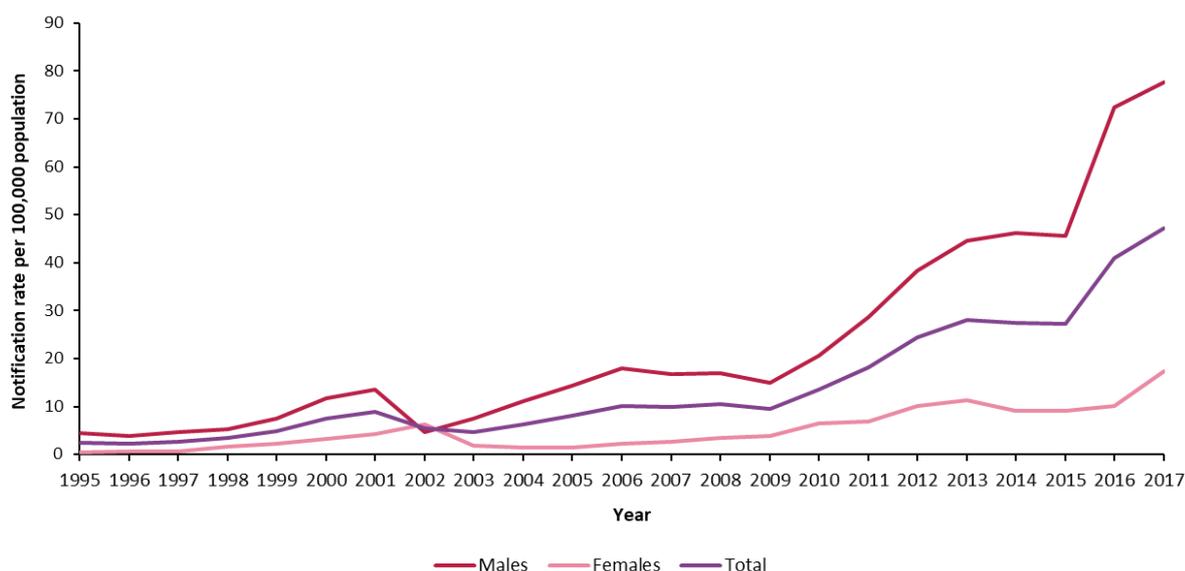


Table 1. Summary of gonorrhoea cases in Ireland, 2017 (n=2,249)

Number of cases		2,249
Notification rate		47.2/100,000
Sex	Males	1,827 (81.2%)
	Females	416 (18.5%)
	Unknown	6 (0.3%)
	Male-to-female ratio	4.4
Age*	Median age (range)	27 years (15-79 years)
	Median age (Female heterosexual)	21 years
	Median age (Male heterosexual)	22 years
	Median age (MSM)	29 years
	Median age (Unknown mode of transmission)	28 years
Age specific rate[†]	Highest overall	221.1/100,000 (20-24 years)
	Highest among males	328.5/100,000 (20-24 years)
	Highest among females	112.5/100,000 (20-24 years)
Mode of transmission[‡]	Men who have sex with men	909
	<i>% where known</i>	60.2%
	Male heterosexual	176
	<i>% where known</i>	11.7%
	Female heterosexual	416
	<i>% where known</i>	27.6%
	Unknown mode of transmission	740
	<i>% of total</i>	32.9%
Multiple STIs	All STIs	523 additional STI notifications in 2017
	Most common: chlamydia	429 chlamydia notifications in 2017

*Excludes 6 cases where sex was unknown and those aged ≤14 years

†Excludes 6 cases where sex was unknown

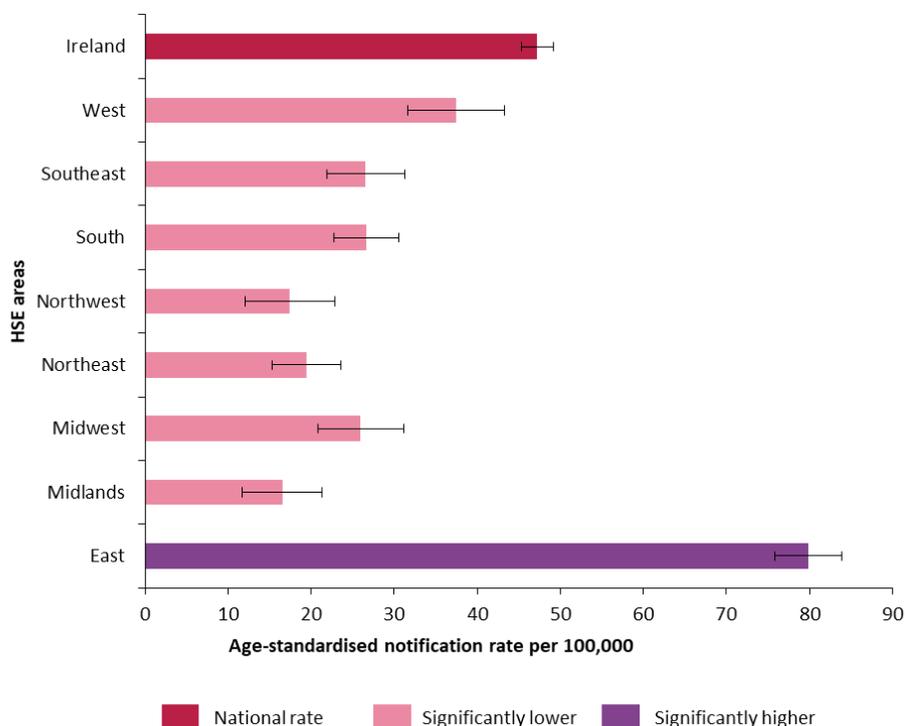
‡Excludes 1 case of mother-to-child transmission; 1 heterosexual case where sex was unknown; and 6 male cases with mode of transmission reported as "other"

Geographical distribution

The highest age-standardised notification rate (ASNR) was in HSE East (79.9/100,000; 95% CI 75.8 – 83.9), which was significantly higher than the national rate (47.2/100,000; 95% CI 45.3 – 49.2). The ASNRs for gonorrhoea were significantly below the national rate in all other HSE areas in 2017 (Figure 2).

Figure 2. Age-standardised notification rate and 95% confidence intervals of gonorrhoea by HSE area compared with the national rate, 2017 (n=2,249)*

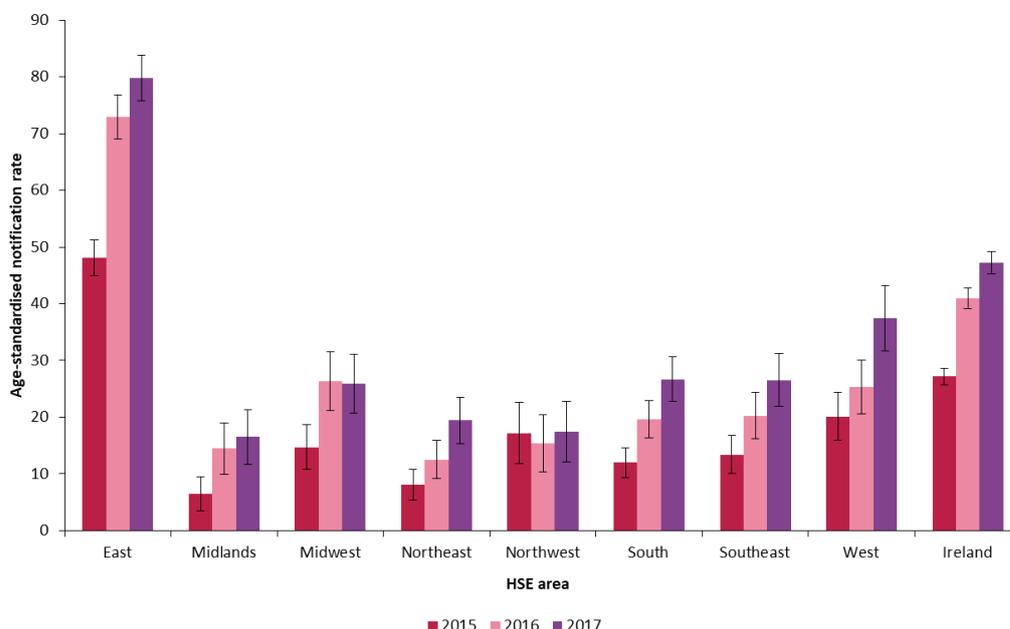
*See technical note 6 for list of counties covered by each HSE area



Overall, nationally, there was a statistically significant increase in the rate of gonorrhoea notifications in 2017, compared with 2016. A statistically significant increase in the rate of gonorrhoea notifications in 2017, compared with 2016, was seen only in HSE West, however, where the ASNR increased by 48% to 37.5/100,000 from 25.4/100,000 (Figure 3).

Figure 3. Age-standardised notification rate and 95% confidence intervals of gonorrhoea by HSE area, 2015 – 2017*

*Excludes 1 case of unknown age in 2016



Age and sex

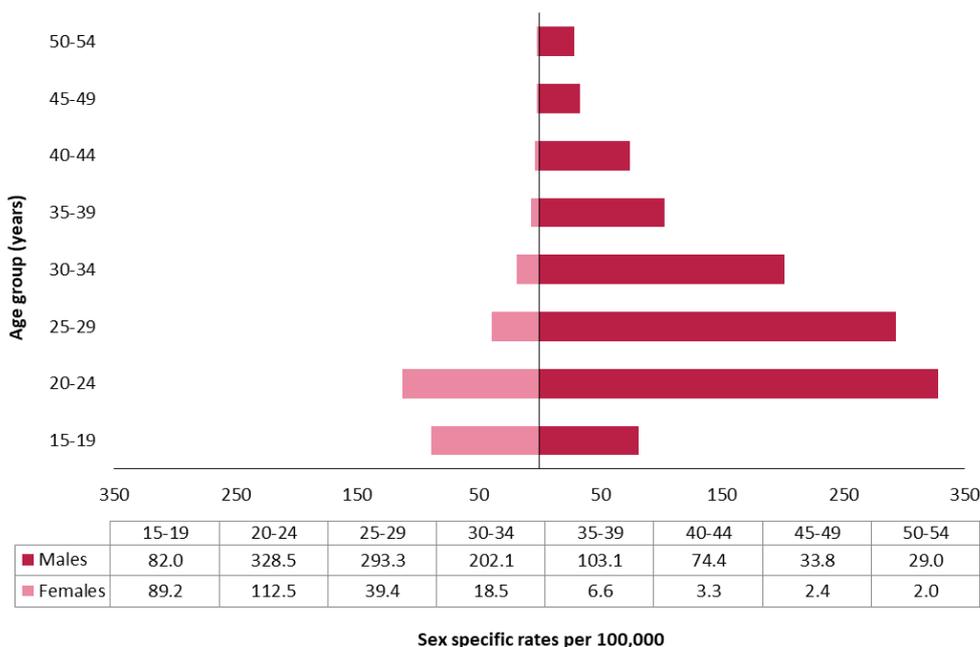
In 2017, 1,827 (81%) gonorrhoea notifications were among males and 416 (19%) were among females. Sex was unknown for 6 cases. The rate of gonorrhoea notifications among females remained stable between 2012 and 2016 but increased by 71% in 2017, to a rate of 17.3 per 100,000 population, compared to 10.1/100,000 in 2016 (Figure 1). Among males the rate of gonorrhoea notifications also increased in 2017, compared to 2016, but the percentage increase among males was much lower than among females at 7% from 72.5/100,00 to 77.6/100,000. The proportion of gonorrhoea cases reported among males decreased from 87% in 2016 to 81% in 2017 and the male-to-female ratio decreased from 7.0 in 2016 to 4.4 in 2017. Across all HSE areas the male-to-female ratio ranged from 1.0 in HSE Northwest to 7.0 in HSE East in 2017.

Young people were most affected by gonorrhoea in 2017. Thirty nine percent (n=864) of gonorrhoea notifications were in young people, aged 15-24 years, giving a notification rate of 149.9/100,000 population among this group and representing a 19% increase from 126.8/100,000 in 2016. In 2017 the highest rate among males was in the 20-24 year age group, followed by the 25-29 year age group. Among females the highest rate was also in the 20-24 year age group but followed by the 15-19 year age group. The 15-19 year age group was the only age group where the NR among females was higher than males (Figure 4).

The median age of cases overall, and among male cases (excluding those aged ≤14 years) was unchanged from 2016 at 27 years and 28 years, respectively. Among female cases the median age was 21 years (range 15-72 years), a slight increase from 20 years in 2016.

Figure 4. Gonorrhoea notification rate by age group and sex in Ireland, 2017 (n=2,188*)

*Excludes cases of unknown sex (n=6). Also excludes cases aged under 14 years and cases aged over 55 years (n=55)



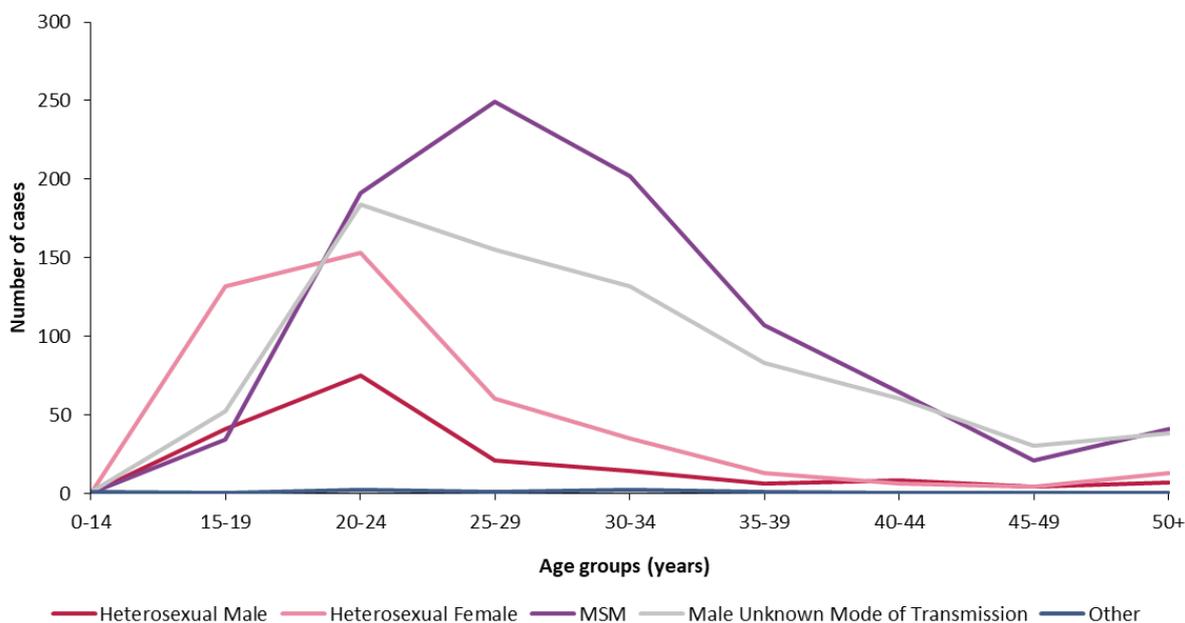
Mode of transmission

Mode of transmission was available for 67% (n=1,509) of cases in 2017. This is a slight increase compared to 2016, where mode of transmission was available for 65% of cases. Of the cases where mode of transmission was known, 60% (n=909) were reported as MSM, a decrease from 68% (n=850) in 2016, and 40% were reported as heterosexual (n=593; 176 males, 416 females and 1 case of unknown sex). This represents an increase in heterosexual transmission of gonorrhoea when compared to the 33% (n=407; 169 males and 238 females) of cases reported as heterosexual transmission in 2016. There was one case of mother-to-child transmission of gonorrhoea in 2017.

MSM tended to be older than heterosexuals, with a median age of 29 years, compared to heterosexuals with a median age of 21 years (males 22 years and females 21 years). The overall median age among MSM and heterosexuals in 2017 was unchanged from 2016, however the median age among heterosexual females increased slightly, from 20 years in 2016. Those with unknown mode of transmission in 2017 (n=740; 735 males and 5 unknown sex) had a median age of 28 years (Figure 5).

Figure 5. Gonorrhoea notifications by age group and mode of transmission in Ireland, 2017 (n=2,243*)

*Excludes heterosexual cases of unknown sex (n=1) and cases of unknown sex and unknown mode of transmission (n=5)

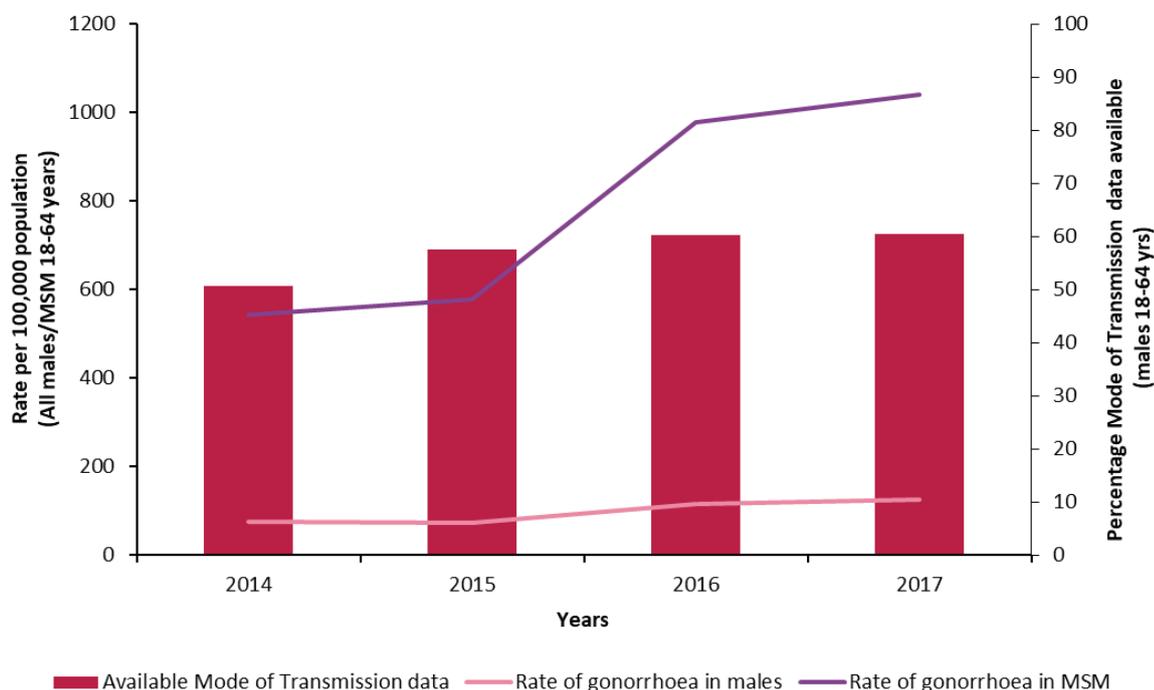


Analysis was restricted to males aged 18-64 years for calculation of the rate of notification per 100,000 MSM population compared to all males aged 18-64 years (see technical note 7). The rate of gonorrhoea notifications in males (aged 18-64 years) increased by 8% to 124.7/100,000 population in 2017, compared with 116.2/100,000 in 2016, and the rate of gonorrhoea notification among MSM (aged 18-64 years) increased by 7% to 1039.9/100,000 in 2017, compared with 976.7/100,000 in 2016. This slight increase in the notification rate among MSM in 2017 follows a 69% increase in notification rate among MSM in 2016 compared with 2015 and demonstrates that, while gonorrhoea notification rates among MSM remain at a high level, the rate of increase slowed in 2017 (Figure 6).

These data should be interpreted with caution, however, given the high level of missing data. Mode of transmission was unknown for 40% (n=715) of cases among males aged 18-64 years and 33% (n=740) of all cases reported in 2017. Additionally, the completeness of data on MSM transmission may be a reporting artefact, as this mode can be assigned in some cases for surveillance purposes, based on attendance at MSM-specific clinics.

Figure 6. Gonorrhoea notification rates in all males aged 18-64 years compared to MSM aged 18-64 years* in Ireland, 2014 – 2017

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



Region of birth

Region of birth was available for 30% (n=666) of gonorrhoea cases in 2017 (Table 2), compared with 33% completeness in 2016. The proportion of patients who reported Latin America as their region of birth decreased in 2017 to 7% (n=49), compared with 12% (n=77) in 2016.

Table 2. Region of birth of patients with gonorrhoea notifications in Ireland, 2017 (n=666)

Region of birth	N*	% [†]
Ireland	510	76.6
Latin America	49	7.4
Central & Eastern Europe	36	5.4
Western Europe	35	5.3
Other	36	5.4
Total	666	100.0

*Number of cases

†Percentage of cases where known

Site of infection

Specimen type was used as proxy for site of infection and was available for 81% (n=1,824) of cases in 2017. However, laboratories typically report only the first site of infection to CIDR, and so specimen type does not represent all the cases or sites of infection.

Genital and pharyngeal sites were most frequently reported first sites of infection among males (42%, n=665 and 32%, n=495, respectively, of all males cases where specimen type was available). Among females, genital and pharyngeal sites were also the most frequently reported first site of infection (78%, n=248 and 20%, n=63, respectively, among female cases where specimen type was available). These proportions are comparable to those reported in 2016. Almost a third of cases reported in 2017 were reported as pharyngeal (n=558), which has important implications for treatment of infection as the pharynx is believed to be a reservoir for antimicrobial resistant *Neisseria gonorrhoeae* (3). Infection at two sites was reported in 57 cases (53 males and four females). Infection at three sites was reported in six cases (all males). Eye infections were reported in 17 cases (14 males, three females and one case of unknown sex). One case of conjunctivitis was in a neonate.

Multiple STIs

Since the start of 2013, case-based data on notifiable STIs (except ano-genital warts and non-specific urethritis) have been reported via CIDR from all HSE areas. This has allowed linkages to be made between different incidences of infection for the same patient, facilitating the reporting of multiple infections and providing a clearer understanding of the burden of STIs and repeat infections.

Among cases who were diagnosed with gonorrhoea in 2017, there were 523 additional notifications of STIs (other than HIV) diagnosed in the same year: 114 among females, 407 among males and two were reported among patients with unknown sex.

Chlamydia trachomatis infection was the most frequently reported other STI (n=429), followed by syphilis (n=48) and genital herpes simplex (n=30) among cases diagnosed with gonorrhoea in 2017. Additional STIs diagnosed among this group include sexually

transmitted hepatitis A, sexually transmitted shigellosis and lymphogranuloma venereum (LGV). Among the cases diagnosed with gonorrhoea in 2017, there were 161 previous diagnoses of gonorrhoea in 2016. Finally, of those diagnosed with gonorrhoea in 2017, 2% (n=33) were newly diagnosed with HIV in 2017, while a further 3% had been diagnosed with HIV prior to 2017.

There were some limitations to these data, however, as full patient identifiers were not provided for all cases, which makes linking patients difficult, and therefore the number of additional STIs diagnosed in 2017 are likely to be an underestimate. Furthermore, the use of more automated systems for processing chlamydia notifications on CIDR in HSE East may have contributed to an underestimate of *Chlamydia trachomatis* infections among cases with gonorrhoea in 2017.

Patient type

Patient type (reflecting the service at which the patient was diagnosed) was available for 99% of gonorrhoea cases in 2017. STI clinics diagnosed 61% of gonorrhoea cases in 2017, compared with 34% of cases diagnosed in general practice. Females were more likely to be diagnosed in general practice, however, as over half of female cases (53%) were diagnosed by GPs, compared to 30% of cases among males, while 66% of male cases were diagnosed in STI clinics, compared with 38% of female cases (Table 3).

Table 3. Gonorrhoea notifications by sex and patient type in Ireland, 2017 (n=2,249)

	Male		Female		Unknown sex		Total	
	N*	%	N	%	N	%	N	%
Emergency department	9	0.5	8	1.9	1	16.7	18	0.8
General Practice	531	29.1	220	52.9	4	66.7	755	33.6
Hospital (inpatient)	3	0.2	4	1.0	0	0	7	0.3
STI clinic (outpatient)	1202	65.8	157	37.7	0	0	1359	60.4
Other	41	2.2	25	6.0	1	16.7	67	3.0
Unknown	41	2.2	2	0.5	0	0	43	1.9
Total	1827	100.0	416	100.0	6	100.0	2249	100.0

* Number of cases

High level azithromycin resistant gonorrhoea

Antimicrobial resistance in gonorrhoea is recognised as a global threat to public health as *Neisseria gonorrhoeae* has rapidly acquired resistance to most antimicrobials that have been used as frontline monotherapy for treatment. The last line of defence against gonorrhoea are the extended spectrum cephalosporins (ESCs), including ceftriaxone. The current national and international guidelines for the treatment of gonorrhoea recommend a

dual therapy regimen with ceftriaxone and azithromycin (4). Azithromycin is expected to act as a barrier to the development of ceftriaxone resistance and extend the useful life of this antimicrobial drug for the treatment of gonorrhoea. However, resistance to azithromycin threatens the success of the dual therapy regimen because if azithromycin becomes ineffective against gonorrhoea, there will be no further barriers to the development of ceftriaxone resistance. The first cases of gonorrhoea with high level resistance to azithromycin and ceftriaxone, resulting in treatment failure, were reported in the UK and Australia in 2018 (5). There have been no cases of treatment failure reported in Ireland to date.

High level azithromycin resistant (HL-AziR) gonorrhoea isolates are not susceptible to azithromycin and display *in vitro* azithromycin minimum inhibitory concentrations ≥ 256 mg/L (MIC ≥ 256 mg/L). Enhanced surveillance is carried out on cases of HL-AziR gonorrhoea to detect outbreaks of HL-AziR gonorrhoea in Ireland, to collate information on the epidemiology of cases of HL-AziR gonorrhoea and to use this information to guide treatment and management of gonococcal infection in Ireland.

During 2017, there were five cases of HL-AziR gonorrhoea reported in Ireland. All cases were male with a median age of 24 years (range 21-29 years). Four of the cases were reported as heterosexual and one was reported as MSM. Cases were reported from three HSE areas and there were no known epidemiological links between the cases. Sites of infection were reported as urethral, pharyngeal and rectal. Four cases were reported as symptomatic and information on symptoms was missing for one case. The number of HL-AziR cases reported in 2017 remained stable compared to 2016, when six cases were reported (four heterosexual males and two females) (6).

Discussion and Recommendations

The national data for 2017 show that there was a 15% increase in the rate of gonorrhoea notifications in Ireland, compared with 2016. The rate of gonorrhoea notifications remains high and increased in 2017 but has slowed in comparison to the 51% increase in notifications that was reported between 2015 and 2016. In the context of an overall stabilisation in the total numbers of STIs reported in the UK in 2017, compared to 2016, there was a 22% increase in the rate of gonorrhoea notifications in England in 2017, which followed a 14% decrease in notification rate between 2015 and 2016 (7). Furthermore, in a recent press release where the Centers for Disease Control and Prevention (CDC) reported “steep and sustained increases” in sexually transmitted diseases (STDs) in the USA between 2013 and 2017, preliminary 2017 data show a 67% increase in gonorrhoea notifications overall and a third successive year of increases in notifications among females (8). Globally, rising rates of gonorrhoea infection are causing concern in the context of the threat of untreatable gonorrhoea.

Part of the increase in gonorrhoea notifications in Ireland in 2017 may be attributed to the greater than 70% increase in rate among females, the largest increase among females

since 2012, while the notification rate among males increased by 7%. The increased proportion of cases reported among females in 2017 resulted in a decrease in the male-to-female ratio.

The proportion of cases reported as MSM was lower in 2017 compared to 2016, and the rate among MSM increased only slightly (7%), compared to the 69% increase in notification rate among MSM between 2015 and 2016. The smaller increase among MSM in 2017 may be attributed to targeted intervention and health promotion strategies, such as condom distribution, peer outreach interventions, and comprehensive HIV and STI testing, which were coordinated by the National MSM HIV/STI Increase Response Group (9).

Young people were largely affected by gonorrhoea in 2017 as 39% of notifications were in those aged 15-24 years, with a notification rate of 149.9/100,000. In the UK the gonorrhoea notification rate among 15-24 year olds was 244.3/100,000 in 2017 (7). In Ireland, cases reported as heterosexual tended to be younger than MSM, highlighting the ongoing need for sexual health awareness campaigns, such as the #respectprotect campaign that was launched by the HSE Sexual Health and Crisis Pregnancy Programme in 2018 to engage young people on social media channels, to promote safe sex and the importance of regularly testing for STIs, even if asymptomatic, when changing sexual partners or following sexual contact with multiple overlapping partners.

Further information on free sexual health services may be found at:

- <https://www.hse.ie/eng/services/list/5/sexhealth>
- <https://www.sexualwellbeing.ie/sexual-health/>
- <http://man2man.ie/>

Completeness of mode of transmission data was slightly improved in 2017 but was still missing for 33% of cases. 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 clinical or laboratory policy on selective culturing from specimens and antimicrobial susceptibility testing of isolates from patients in at-risk groups, to prevent the transmission of antimicrobial resistant strains. National guidelines on the prevention of gonorrhoea and for minimising the impact of antimicrobial resistant *Neisseria gonorrhoeae* were published in 2017 to provide guidance on the clinical, laboratory and public health management of gonorrhoea infection and on the gonorrhoea prevention strategies that can be employed to reduce the risk of antimicrobial resistance in gonorrhoea (4). In 2018 a national multi-disciplinary forum on antimicrobial resistance in gonorrhoea was convened to review international and national data and to provide guidance on prevention and management of gonorrhoea in the Irish context.

Technical notes

1. Data were analysed by date of notification on CIDR.
2. Data for this report were extracted from CIDR on 31st of August, 2018, and were correct at the time of publication.
3. Please note that the information from previous years is updated on an ongoing basis in CIDR, and so information on previous years represents our current understanding and most up to date data as of 31st August, 2018, and may not correspond exactly with what was reported in previous annual reports. Similarly, data for 2017 may be updated further in due course and will be reported on in subsequent annual reports.
4. While efforts are made to remove duplicate records from these data, it is not always possible to link and remove all duplicate records and some patients or disease events may be counted more than once.
5. Percentages are rounded up in the text and are provided to one decimal place in the tables.
6. The counties covered by each HSE area are as follows: HSE East (ERHA): Dublin, Kildare & Wicklow; HSE Midlands (MHB): Laois, Longford, Offaly & Westmeath; HSE Midwest (MWHB): Clare, Limerick & Tipperary North; HSE Northeast (NEHB): Cavan, Louth, Meath & Monaghan; HSE Northwest (NWHB): Donegal, Leitrim & Sligo; HSE South (SHB): Kerry & Cork; HSE Southeast (SEHB) Carlow, Kilkenny, Tipperary South, Waterford & Wexford; HSE West (WHB): Galway, Mayo & Roscommon.
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 survey (10).
8. Age standardised notification 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 (www.cso.ie). Data were aggregated into the following age groups for analysis: 0-4 years, 5-9 years, 10-14 years, 15-19 years, 20-24 years, 25-34 years, 45-54 years, 55-64 years and ≥65 years.

Further information available on HPSC website

<http://www.hpsc.ie/a-z/hivstis/sexuallytransmittedinfections/gonorrhoea/>

<http://www.hpsc.ie/a-z/hivstis/sexuallytransmittedinfections/publications/stireports/>

<http://www.hpsc.ie/a-z/hivstis/sexuallytransmittedinfections/publications/stireports/stiweeklyreports/>

<http://www.hpsc.ie/a-z/hivstis/sexuallytransmittedinfections/gonorrhoea/amrgonorrhoea/>

Acknowledgements

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Report prepared by:

Aoife Colgan and Derval Igoe, October 2018.

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