Surveillance report

Syphilis in Scotland 2018: update

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Key points

- In 2018, 455 diagnoses of infectious syphilis were reported to HPS, a 14% increase on that reported in 2017 (399 cases) and the highest annual total recorded since this surveillance system was established in 2002/2003.
- The majority of diagnoses (87%) were recorded among men who have sex with men (MSM) which included 28 bisexual males. Diagnoses among MSM have increased year on year for four years and, in 2018, were three fold higher than in 2014 - the highest number of diagnoses recorded since the previous peak in 2008.
- The impact of NHS-funded HIV pre-exposure prophylaxis (PrEP) is not yet fully understood, but it now looks possible that this intervention is associated with the observed increase in the incidence of STI diagnoses in MSM.
- Syphilis continues to be acquired heterosexually (11%) with some diagnoses being made via routine screening programmes such as antenatal and blood donor testing.

In this report, the 2018 data from the National Enhanced Surveillance of Infectious Syphilis Scotland (NESISS) are presented. This enhanced surveillance system was established in December 2002 and collates laboratory and clinical information on infectious syphilis.[1] Data are returned from two sources:

- sexual health clinics – clinicians and sexual health advisors across Scotland provide demographic and behavioural information on individuals presenting at clinics via a paper form;
- diagnostic laboratories – microbiology staff provide details of test results directly to HPS or via the Electronic Communication of Surveillance in Scotland System (ECOSS).[2]

Details from both sources are matched at Health Protection Scotland (HPS) and entered into the NESISS database.

Infectious syphilis in Scotland: 2018

A total of 455 diagnoses of infectious syphilis were reported during 2018; a 14% increase on that reported in 2017 (399) and the highest number recorded since the implementation of the system in 2002/2003. The annual number of diagnoses has been increasing year on year since 2015 when a doubling of diagnoses was observed (rising from 159 in 2014 to 316 in 2015). Consistent with the rise in diagnoses observed in recent years, the increase recorded

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in 2018 (Figure 1) is predominantly due to an increase among men, especially MSM. Of the 455 diagnoses recorded, the majority (96%, 437) were male, 4% (17) were female and one individual's gender was unknown. Of the males, 87% (394/437) were MSM (28 of whom identified themselves as bisexual), 38 (9%) were heterosexual, and for five (1%) no sexual orientation data were available (Table 1 and Figure 1). The median age of those diagnosed in 2018 was 33 years: this is similar to the median ages recorded in 2016 and 2017 (32 years and 34 years, respectively).

Table 1: Number of infectious syphilis diagnoses in Scotland by NHS board of diagnosis and treatment and sexual orientation, 2009-2018

Year	NHS board	Female	Male heterosexual	MSM[1]	Unknown	Total
2009	Greater Glasgow & Clyde	*	5	43	6	58
	Lothian	*	14	53	*	79
	Rest of Scotland	12	11	26	*	53
	Sub Total	**26**	**30**	**122**	**12**	**190**
2010	Greater Glasgow & Clyde	*	*	25	*	37
	Lothian	*	*	62	7	79
	Rest of Scotland	*	7	24	*	39
	Sub Total	**10**	**18**	**111**	**16**	**155**
2011	Greater Glasgow & Clyde	*	*	53	*	61
	Lothian	*	*	61	*	78
	Rest of Scotland	7	8	31	*	47
	Sub Total	**14**	**19**	**145**	**8**	**186**
2012	Greater Glasgow & Clyde	*	5	63	*	70
	Lothian	*	8	74	*	89
	Rest of Scotland	10	8	27	*	47
	Sub Total	**17**	**21**	**164**	**4**	**206**
2013	Greater Glasgow & Clyde	*	6	43	*	54
	Lothian	*	8	52	*	63
	Rest of Scotland	13	14	25	*	54
	Sub Total	**17**	**28**	**120**	**4**	**171**
2014	Greater Glasgow & Clyde	*	*	46	*	50
	Lothian	*	*	31	*	46
	Rest of Scotland	11	11	35	6	63
	Sub Total	**18**	**20**	**112**	**9**	**159**
2015	Greater Glasgow & Clyde	5	13	104	*	122
	Lothian	*	5	81	*	86
	Rest of Scotland	*	14	79	*	93
	Sub Total	**14**	**32**	**264**	**6**	**316**
2016	Greater Glasgow & Clyde	*	6	101	*	112
	Lothian	*	7	106	*	122
	Rest of Scotland	10	21	88	*	122
	Sub Total	**20**	**34**	**295**	**7**	**356**
2017	Greater Glasgow & Clyde	7	17	63	*	190
	Lothian	5	9	108	*	124
	Rest of Scotland	9	12	161	*	83
	Sub Total	**21**	**38**	**332**	**6**	**397**
2018	Greater Glasgow & Clyde	5	8	183	*	196
	Lothian	0	7	121	*	128
	Rest of Scotland	12	23	90	*	125
	Sub Total	**17**	**38**	**394**	**6**	**455**

Figure 1a: Number of infectious syphilis diagnoses in Scotland by gender and sexual orientation and quarter year, 2009-2018.

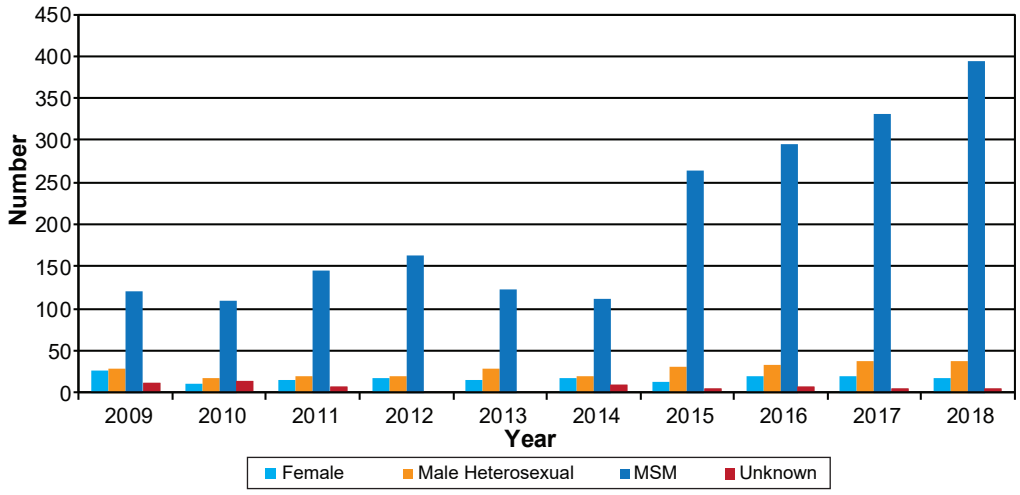
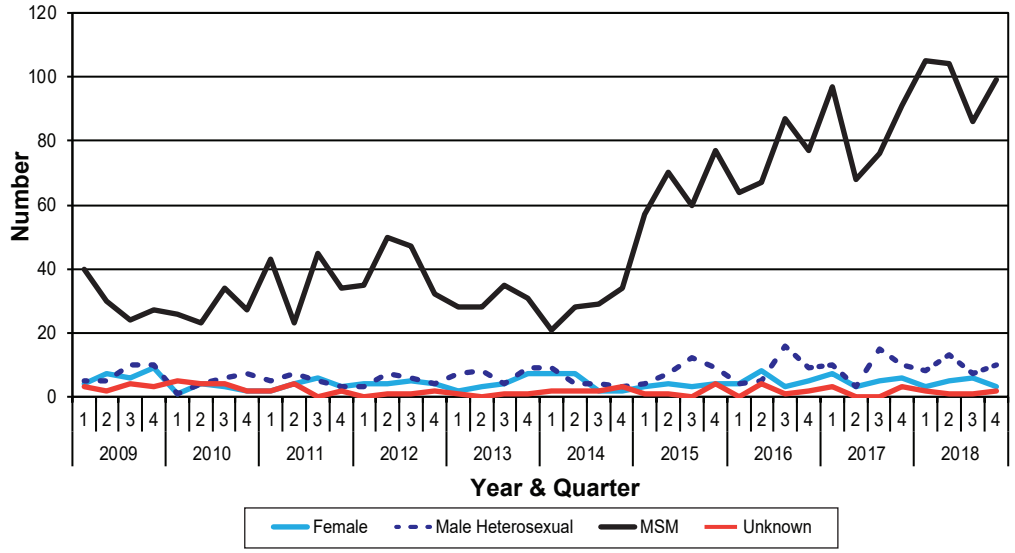


Figure 1b: Number of infectious syphilis diagnoses in Scotland by gender and sexual orientation and quarter year, 2009-2018.



In 2018, 44% (198/455) of individuals were diagnosed at sexual health clinics in NHS Greater Glasgow & Clyde and a further 29% (131/455) in NHS Lothian. The remaining individuals (126/455, 28%) were diagnosed in ten of the other 12 NHS boards (Figure 2a). The proportion of diagnoses recorded in NHS Greater Glasgow & Clyde is similar to that observed in 2017 (48%, 190/399) following an increase of 17% between 2016 and 2017 (from 31% (112/356) in 2016). Based on first part postcode data which were available for 429 individuals, syphilis infection was diagnosed among individuals living in twelve of the fourteen NHS boards. Of the 198 individuals diagnosed in NHS Greater Glasgow & Clyde, NHS board of residence was known for 193; of these individuals, approximately three quarters (77%, 148) were residents of the NHS board area and the remainder were residents of five other NHS boards. Among the 131 individuals diagnosed in NHS Lothian, 123 (94%) were residents of that NHS board area and the remaining eight diagnosed individuals were resident in three other NHS board areas (Figure 2b); this is far fewer than in the previous year when residents of eight boards accessed syphilis testing in NHS Lothian.

Figure 2: Number of infectious syphilis diagnoses in Scotland in 2018 by NHS board.

Figure 2a: By NHS board of diagnosis and treatment.

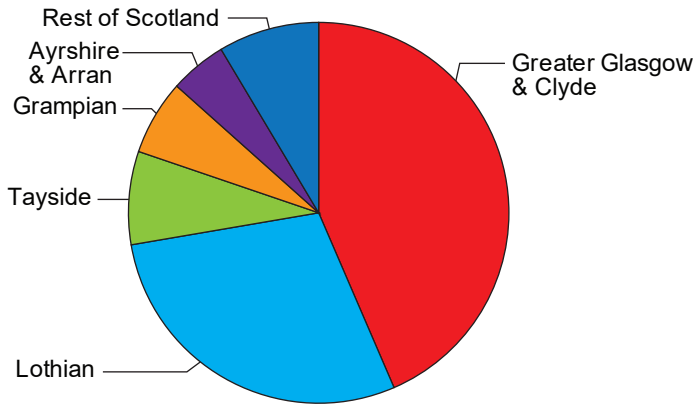
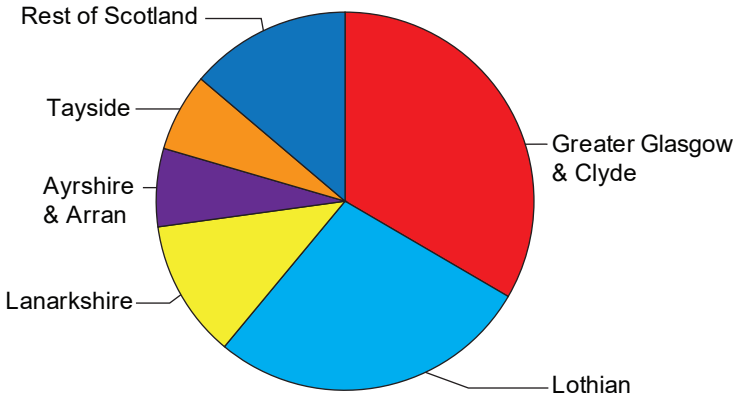


Figure 2b: By NHS board of residence.



In 2018, the majority of infections (for which place of acquisition was reported) were presumed to have been acquired through contacts in Scotland (306/449, 68%) (Table 2); this is a similar proportion to the annual average of 70% recorded over the previous five years (2013-2017). Of 19 individuals who reported multiple possible exposure locations, over two thirds (13) included a Scottish location.

Table 2: Number of infectious syphilis diagnoses in Scotland in 2018 by presumed location of infection acquisition and sexual orientation

Presumed location of infection	Women	Heterosexual men	MSM[1]	Unknown	Total
Scotland	14	22	268	*	306
UK (not Scotland)	*	*	16	*	19
Europe (not UK)	*	*	12	*	15
World (not Europe)	*	*	11	*	17
Multiple locations	*	*	18	*	19
Unknown	*	7	69	*	79
Total	**17**	**38**	**394**	**6**	**455**

1. In the MSM group, presumed location of infection in Scotland includes 18 bisexual males, UK (not Scotland) includes 1 bisexual male, Europe (not UK) includes 2 bisexual males, Multiple locations includes 1 bisexual males, and Unknown includes 6 bisexual males.

The stage of infection was identified in 449 of the 455 (99%) infections (Table 3). Of these 449 diagnoses, over half (229, 51%) were primary infection, 102 (23%) were secondary infection and one quarter (25%, 113) were early latent infection. This is a similar proportion of primary diagnoses to that observed in 2017 (56%, 214/381) which was the highest proportion observed during the past five years.

Table 3: Number of infectious syphilis diagnoses reported in Scotland in 2018 by stage of infection and sexual orientation.

Stage	Women	Heterosexual men	MSM[1]	Unknown	Total
Primary	*	18	205	*	229
Secondary	6	9	85	*	102
Early latent	7	11	94	*	113
Unknown	*	0	10	*	11
Total	**17**	**38**	**394**	**6**	**455**

1. Includes 28 bisexual men.

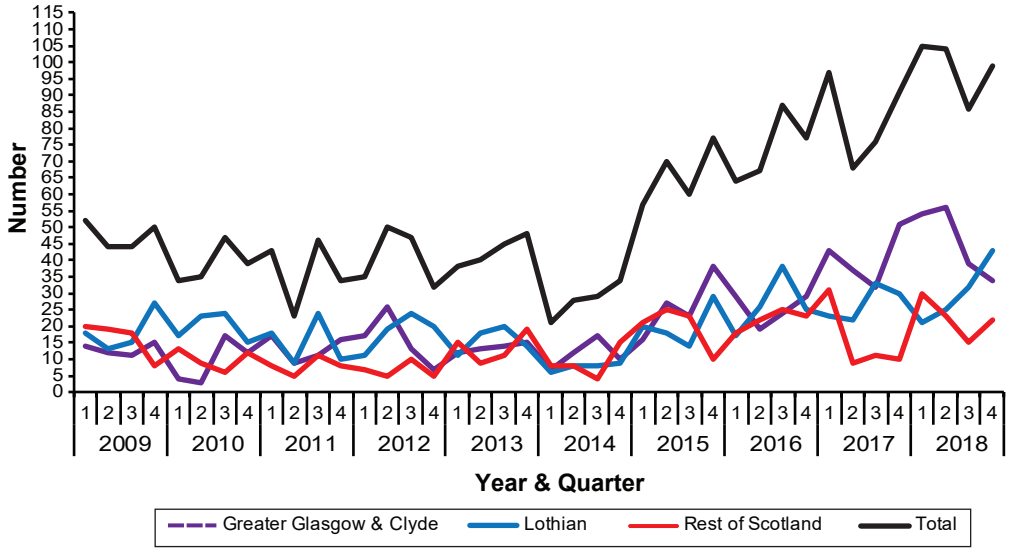
Of the 455 diagnoses, 88 (19%) were HIV positive, 329 (72%) were HIV negative and for 38 (8%) HIV status was unknown. This is a slightly higher proportion compared to those recorded in 2016 and 2017 (17% and 16%, respectively), but is a reduction on that recorded in 2015 (25%). Where ethnicity was recorded, the majority of diagnoses (81%, 366/451) were White-British. This is similar to the ethnic pattern of diagnoses for the previous five years (ranging from 79% to 87% between 2013 and 2017).

Infectious syphilis among MSM: 2018

In 2018, 394 (87%) diagnoses of infectious syphilis were made in MSM; this number has increased year on year for four years and is now three fold higher than that reported in 2014 (112). Furthermore, it is the highest number recorded since the previous peak in 2008 (260) (Table 1, Figure 3). Quarterly totals for 2018 are consistently higher than those recorded in 2017 (Figure 3). The number of primary infections among this group has increased annually over the last five years with an almost four fold increase since 2014 (rising from 52 in 2014 to 205 in 2018). Comparison of primary infection data for the first and second halves of 2017 and 2018 indicate an overall 32% increase in the number of diagnoses recorded since January to June 2017 (81 primary infections) to July to December 2018 (107 diagnoses); these data are important for the monitoring of syphilis incidence following the introduction of HIV pre-exposure prohylaxis (PrEP) via the NHS in Scotland in July 2017.

A total of 28 men (7%, 28/394) reported their sexual orientation as bisexual. Overall, MSM were aged between 17 and 71, with a median age of 33 years, while the subgroup of 28 bisexual men had a median age of 33 (with an age range from 18 to 59 years). There has been a considerable decrease in the median age of bisexual men which was recorded as 44 years (ranging from 17 to 63) in 2017.

Figure 3: Number of infectious syphilis diagnoses among MSM in Scotland by NHS board of diagnosis and treatment and quarter year, 2009-2018.



Note: Total includes four cases in 2007 and one in 2010 which were diagnosed in non-GUM clinic settings.

In 2018, the majority of the diagnoses in MSM (304/394, 77%) were made in Greater Glasgow & Clyde and Lothian NHS board areas (Table 1 and Figure 3). Place of residence information (postcode sector) is available for 375 diagnoses, indicating that syphilis infection was diagnosed in patients living in eleven of the fourteen NHS boards. Of the 183 men diagnosed in NHS Greater Glasgow & Clyde, 134 were residents of Greater Glasgow & Clyde and the remainder were residents of five other NHS boards. Of the 121 diagnosed in NHS Lothian, 114 were residents of Lothian and the remainder were residents of three other NHS boards.

Disease stage was recorded for 384 diagnosed individuals: 205 (53%) had primary, 85 (22%) secondary and 94 (24%) early latent syphilis (Table 3). From the information available, at least 68 MSM in 2018 are known to have had at least one previous episode of syphilis during the past twelve years of monitoring; this number is the highest recorded over the last five years and represents a 39% increase between 2017 and 2018 (from 49 in 2017 to 68 in 2018).

HIV status was known for 362 men at the time of their syphilis diagnosis: around one fifth reported being HIV positive (84, 23%); this is a slightly higher proportion than that recorded in 2017 (19%), but lower than the proportion reported in 2015 (28%).

Oral sex is often considered as a 'safe' alternative to penetrative sex; however, syphilis infection is readily transmitted by this route. For the 229 MSM who provided information about whether oral sex was the most likely route of transmission, 24% (54/229) said yes. This is a small decrease compared to 2017 (27%, 52/195); however, this proportion fluctuated over the previous four years (35% in 2016, 31% in 2015, 28% in 2014, and 31% in 2013). Among men co-infected with HIV who answered this question, 9 of 62 (15%) also indicated that oral sex was the most likely route of transmission (Table 4); this is similar to the proportion of HIV positive MSM reported in 2014 (17%), but is far lower than those reported in 2013, 2015, 2016 and 2017 (35%, 38%, 36%, and 33%, respectively).

Table 4: Number of infectious syphilis diagnoses among MSM[1] reported to HPS in 2018 by HIV status and whether oral sex was the likely route of acquisition of infection.

HIV status	Oral sex only - YES	Oral sex only - NO	Unknown	Total
Positive	9	53	22	84
Negative	40	115	123	278
Unknown	5	7	20	32
Total	**54**	**175**	**165**	**394**

1. Includes 28 bisexual men.

Place where infection was acquired was recorded for 325 MSM; of these men, 268 (82%) reported that the likely place of acquisition was a location in Scotland, a further 16 (5%) were presumed to have acquired their infection from contacts elsewhere in the UK, and another 12 (4%) reported acquiring their infection from contacts elsewhere in Europe (Table 2). The remainder of the men reported likely acquisition in other regions of the world or multiple possible locations for acquisition. The majority (67%, 12/18) of those who reported multiple possible exposure locations also mentioned a Scottish location.

An indication of the social venues and networks used to meet partners is described in Table 5. Data are available from 152 MSM who were likely to have acquired their infection in Scotland; as in recent years, the internet and phone apps are the most popular methods of meeting partners (50%, 76/152). By comparison, the proportion of men reporting meeting partners in bars/clubs and saunas has returned to the level seen in 2015 following a decline (17% in 2015, 7% in 2016, 8% in 2017, and 15% in 2018).

Table 5: Means of meeting partners in Scotland, described by 152 MSM[1] with presumed infection acquisition in Scotland in 2018.

Means of meeting partners	Number reporting use
Internet (including phone apps)	76
Other (regular partner/casual partner/friend)	29
Multiple methods	28
Sauna	13
Bars and/or Clubs	9
Chemsex/slamming parties	*
Public sex environment	*
Commercial sex worker	*

1. Includes 10 bisexual men.

In 2018, of 394 infectious syphilis diagnoses among MSM, 347 provided an estimate of the number of sexual partners in the three months prior to diagnosis. A total of 1758 sexual contacts were reported, varying between one and more than 20 contacts during the three-month period (Table 6), with almost three quarters (250/347, 72%) reporting fewer than five partners. Similar to previous years, as the number of reported contacts increased, the proportion traceable decreased. In 2018, among those men who reported fewer than five contacts, 68% (359/525) of these contacts were traceable compared with 28% (345/1233) among those reporting more than five contacts. It should be noted that a larger proportion of the men who reported having had five or more contacts had met their partners through potentially anonymous routes such as via the internet, sex parties, and public sex

environments compared to those who reported fewer than five contacts (91% versus 75%). Furthermore, an appreciable minority (13%, 46/347) reported ten or more sexual partners in the last three months.

Table 6: Number of contacts for diagnoses of infectious syphilis among 347 MSM[1] reported to HPS in 2018.

Number of contacts per case	Number of cases	Total contacts	Total contacts traced	Proportion of contacts traced
1	89	89	72	81%
2	77	154	113	73%
3	54	162	102	63%
4	30	120	72	60%
5-9	51	304	180	59%
10-20	36	510	141	28%
>20	10	419	24	6%
Total	**347**	**1758**	**704**	**40%**

1. Includes 28 bisexual men.

Heterosexually acquired infectious syphilis: 2018

In 2018, there were 55 diagnoses of infectious syphilis in those who were thought to have acquired the infection through heterosexual intercourse; 17 were female (a small number of whom identified as bisexual) and 38 were male (Table 1 and Figure 1). The median age was 26 years and 39 years for female and male diagnoses, respectively; this represents a decrease in median age for women (29 years in 2017) and an increase for men (36 years in 2017).

Among heterosexuals diagnosed with syphilis and for whom country of birth was reported, the majority were born in the UK (42/46, 91%); this proportion has remained stable over the past five years. Of those infected heterosexually in 2018 and for whom place of acquisition was known, 77% (36/47) acquired their infection in Scotland (Table 2); this is a higher proportion than those recorded in 2015 (56%) and 2016 (52%). Diagnoses were made in seven NHS board areas with the highest number of diagnoses (13/55, 24%) made in NHS Greater Glasgow & Clyde, followed by eight in NHS Ayrshire & Arran, seven in Dumfries & Galloway, NHS Grampian, and NHS Lothian, six in NHS Lanarkshire and five in NHS Tayside. This represents a more even geographical spread of diagnoses compared to previous years when NHS Greater Glasgow & Clyde and NHS Lothian accounted for the majority of diagnoses.

Information about stage of infection was available for 54 of 55 individuals (98%) in 2018 (Table 3). Of these, over one third (39%, 21) had a primary infection, one quarter (28%, 15) had a secondary infection, and 18 (33%) had an early latent infection. Fewer primary infections were diagnosed compared to 2017 when over half (56%, 31/55) of diagnoses among heterosexuals were primary infections. There is little evidence of HIV infection in this group.

From the data available on source of referral or reason for testing, less than half (18/45, 40%) of those diagnosed presented with symptoms. One quarter of individuals diagnosed (26%, 12/46) were referred for testing because they were contacts of diagnosed individuals. At least thirteen individuals were referred to a sexual health clinic for testing and management from one

of the routine screening programmes (either through blood donation screening or the antenatal testing programme).

Of the 55 heterosexual diagnoses recorded, information about the number of contacts was available for 47; these 47 heterosexuals reported a total of 124 contacts in the three months prior to their diagnosis, with the majority reporting five or fewer partners. Notably, the total number of contacts has increased by 70% compared to 2017 when 48 individuals reported 73 contacts. Of the 124 contacts reported in 2018, one third (32%, 40/124) could be traced; this compares with two thirds (68%, 50/73) of contacts reported in 2017 being traceable. Over the past five years, this proportion has fluctuated between 47% and 79%.

Discussion

During 2018, the overall incidence of infectious syphilis in Scotland was at its highest level since the implementation of the current surveillance system in 2002/2003, exceeding the previous highest level recorded in 2017. Using data recorded in clinics during the past almost one hundred years, this is the highest total recorded in men since the early 1950s. Between 2014 and 2015, the number of diagnoses doubled (159 to 316 diagnoses) and then continued to rise in 2017 and 2018 (399 and 455 diagnoses, respectively). The increase observed in 2018 is a result of an increase in diagnoses among MSM. MSM are the most affected population; however, the number of diagnoses among heterosexuals has also increased in recent years from 38 in 2014 to 55 in 2018. This mirrors the overall epidemiological picture observed in England where a 20% increase in syphilis diagnoses between 2016 and 2017 was observed, representing the largest number of diagnoses recorded since 1949.[3] Similar to the situation in Scotland, this increase has been attributed to a rise in the number of diagnoses among the MSM community.

In July 2017, Scotland became the first of the UK nations to make PrEP available via the NHS to those who are eligible and at highest risk of HIV exposure given trial data which indicate its efficacy in reducing the incidence of HIV.[4] There are reports and public health concerns, however, that the incidence of STIs may increase if condom use decreases in the era of PrEP. To monitor STI incidence, HPS has undertaken analysis of infection data during the first year of the programme. During this period, 1855 (99%) of the 1872 individuals prescribed PrEP were MSM.[5] Among those prescribed PrEP, rates of gonorrhoea (including rectal) testing and numbers diagnosed positive increased between the two 12 month periods either side of NHS PrEP being introduced, but rates of actual infection remained similar. Such rates were higher among those ever versus never prescribed PrEP. Similar observations were recorded for chlamydia with an increase in testing and diagnoses among MSM ever prescribed PrEP, but no overall change in the proportion positive pre and during the first year of NHS PrEP.[5] While the impact of PrEP availability is not yet fully understood, it now looks possible that this intervention is associated with the observed increase in the incidence of STI diagnoses in MSM.

Co-infection with HIV continues to be apparent among a proportion of MSM diagnosed with syphilis. In 2018, approximately one fifth of men diagnosed with syphilis were co-infected; this is a similar proportion to that observed in 2017. This said, data available on recently acquired HIV infection (that is acquired within the preceding three to four months) support a decrease in recently acquired infections. In 2018, 24% of MSM tested had evidence of a recent infection; this compares with almost one third of MSM (32%) in 2017, one fifth (21%) in 2016 and over

one third (35%) in 2015.[6] As part of the implementation of the PrEP programme, as well as measuring STI incidence, there is a focus on the monitoring of new (including recent) HIV infections. Of particular concern is the proportion of primary syphilis infections observed over the last few years.

In recent years, there have been several other sexual health concerns among the MSM population; these include sexually transmitted enteric infections (STEI), particularly if sexual practices involve faecal-oral contamination, such as Shigella species and hepatitis A virus. The transmission of several different Shigella species has occurred in various cities with large MSM communities in England over the past few years.[7,8] The association of transmission of this STEI with high numbers of sexual partners, high rates of HIV co-infection and links to chemsex has been a concern.[9] Continued detection of clusters among MSM, assisted by the use of whole genome sequencing, indicates the importance of education, testing and treatment among this group.[8] An outbreak of hepatitis A, largely affecting MSM, occurred throughout Europe in 2016/2017 with 4,475 confirmed diagnoses recorded in the latest ECDC report as at 7 September 2018.[10] While large numbers of MSM were diagnosed in England, far fewer diagnoses were recorded in men resident in Scotland who reported MSM exposure or were infected with one of the MSM outbreak strains. In Scotland, increases in other rectal STIs, such as rectal chlamydia, Lymphogranuloma venereum (LGV) and rectal gonorrhoea, have also been recorded and are discussed in a separate report.

While the major burden of infectious syphilis occurs in the MSM population, 15% of syphilis diagnoses were among those who acquired the infection via heterosexual intercourse. The majority of heterosexual diagnoses were of White-British ethnicity and were presumed to have acquired their infection in Scotland.

In 2018, a small number of infectious syphilis cases (less than five) were detected in women via antenatal and blood donation screening programmes, a lower number than the seven women whose infection was diagnosed through this route in 2017. Antenatal screening, with appropriate treatment and management, remains important to prevent re-emergence of congenital syphilis particularly in the context of previous outbreaks in the heterosexual population.[11] A review of the incidence of congenital syphilis in the UK between 2011 and 2015, indicates an incidence of <0.5 per 1000 live births – below the WHO threshold for elimination, but continual monitoring is required.[12,13]

In Scotland, infectious syphilis remains a serious public health problem, particularly among MSM. The increase in diagnoses, observed in 2018, underlines the need for a re-focussed public health response. There is evidence of high-risk behaviour among a proportion of MSM in Scotland through various behavioural studies. The most recent of these, the Social Media, Men Who Have Sex With Men, Sexual and Holistic Health Survey (SMMASH2), reported that over half of the 1500 MSM surveyed had CAI in the previous 12 months and one fifth had engaged in CAI in the previous three months.[14] Furthermore, the survey uncovered that one fifth of participants had never had an HIV test. Behavioural studies from abroad, notably the Melbourne and Sydney Gay Community Periodic Survey, also identify high-risk behaviour; consistent condom use among the gay and bisexual men surveyed decreased from 46% (1360/2692) in 2013 to 31% (1229/4018) in 2017.[15] Both behavioural and infection data underline the importance of ongoing activities for the prevention and control of syphilis infection which focus on: i) testing and diagnosing; ii) effective partner management; iii) health promotion; and, iv) education and awareness-raising via national campaigns and local initiatives. Similarly, the provision of MSM-specific services are key while syphilis and other STI

testing opportunities, along with other sexual health services, have become more accessible in community venues. Without sufficient understanding and knowledge of the early symptoms, infectious syphilis diagnosis is sometimes missed. As a consequence, routine sexual health check-ups are essential for those at highest risk. Given that partner management continues to present a challenge for the control of infection due to the large number of multiple anonymous contacts among MSM, the ongoing promotion of good sexual health among this community is imperative.

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NHS board abbreviations

AA	Ayrshire & Arran	BR	Borders	DG	Dumfries & Galloway	GGC	Greater Glasgow & Clyde
FF	Fife	FV	Forth Valley	GR	Grampian	HG	Highland
LO	Lothian	LN	Lanarkshire	OR	Orkney	SH	Shetland
TY	Tayside	WI	Western Isles				

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