Public Health England

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Human papillomavirus (HPV) vaccination uptake in gay, bisexual and other men who have sex with men (MSM)

National programme: 2019 annual report

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Executive summary

The national human papillomavirus (HPV) vaccination programme for gay, bisexual and other men who have sex with men (MSM) has been offering vaccination to MSM attending sexual health and HIV clinics in England since April 2018, following a successful pilot that ran from June 2016 to March 2018.

This report provides an update on the progress of the national HPV MSM vaccination programme in its second year of delivery. Vaccination activity was reported by 93% of specialist sexual health services (SSHS) and 69% of HIV clinics by the end of December 2019: data from these reporting sites are included in the report. Data from SSHS and HIV clinics are reported separately.

Recorded first dose initiation of eligible MSM attending in 2019 was 33.7% (36,016/106,835) at SSHS and 18.0% (456/2,528) at HIV clinics. Overall second and third dose completion was 56.5% (41,336/73,147) and 27.2% (19,875/73,147), respectively, at SSHS, and 62.2% (836/1,345) and 34.8% (468/1,345), respectively, at HIV clinics.

To the end of 2019 (since 6 June 2016), 73,147 and 1,345 MSM have received at least one vaccine dose in SSHS and HIV clinics, respectively.

In 2019, similar to previous years, less than 5% of eligible MSM declined the vaccine. The proportion of MSM with no HPV vaccine record remained high, suggesting reported uptake may be an underestimate. Vaccination initiation, and second and third dose completion, in MSM attending SSHS and HIV services will continue to be monitored and causes for apparent low uptake will be investigated. Vaccination initiation and completion in 2020 and beyond will be investigated to evaluate the impact of the COVID-19 pandemic on programme delivery and the effectiveness of catch-up activity.

Main points

The main findings of this report are that:

- at SSHS, recorded first dose initiation of eligible MSM was 33.7% in 2019, with over 36,000 eligible MSM receiving a first dose (compared to 27.9% uptake with 17,019 doses received in 2018)
- at HIV clinics, recorded first dose initiation was 18.0% in 2019, with 456 eligible MSM receiving a first dose (compared to 11.1% uptake with 143 doses received in 2018)
- the proportion of MSM offered and declining vaccination in 2019 was 1.7% in SSHS and 4.1% in HIV clinics
- between pilot start (earliest 6 June 2016) and end December 2019, recorded initiation was 40.8% at SSHS and 36.2% at HIV clinics, with 73,147 (including 8,578 known to be HIV positive) and 1,345 MSM having now received at least one vaccine dose in SSHS and in HIV clinics, respectively
- second and third dose completion at SSHS was 56.5% and 27.2%, respectively
- second and third dose completion at HIV clinics was 62.2% and 34.8%, respectively
- as with previous years, the proportion of eligible MSM with no HPV vaccine record remains high: this is likely partly due to opportunities for vaccination being missed and partly due to some under-recording of vaccinations that have been given (ie resulting in recorded uptake being an underestimate)

Background

The disease

Human papillomavirus (HPV) is a sexually transmitted virus known to cause cancers of the cervix, anus, penis, vulva, vagina and oropharynx (1, 2). There are over 100 different types of HPV, of which 13 have been shown to be associated with approximately 99% of cervical cancers with the majority caused by HPV types 16 and 18 (3). In males, HPV is associated with 80 to 85% of anal cancers, 6 to 71% of oropharyngeal cancers and 50% of penile cancers (4, 5). Additionally, HPV types 6 and 11 cause approximately 90% of genital warts in both males and females (6). HPV-associated cancers, particularly anal cancer, disproportionately affect and are more common in MSM compared to heterosexual males. HIV positive MSM in particular have a higher risk of HPV-related disease (7). Further information about the disease can be found in the 'Human papillomavirus (HPV): the green book, chapter 18a' (5).

HPV vaccination for MSM

The national HPV vaccination programme for MSM has been offering vaccination to MSM attending sexual health and HIV clinics in England since April 2018, following a successful pilot that ran from June 2016 to March 2018. This programme runs in addition to the school-based national adolescent HPV Vaccination Programme initially introduced in 2008 for girls and extended to boys from 2019. Targeted vaccination for MSM was introduced on the basis of the Joint Committee on Vaccination and Immunisation recommendation, which recognised the higher risk of infection and disease in MSM, the ongoing nature of this risk into later decades of life for MSM attending SSHS and HIV clinics and the lower herd protection to MSM from the years of female-only vaccination (8, 9). This rationale remains valid since extension of the national school-based programme to males: prior HPV vaccination is recorded as a reason for not vaccinating otherwise eligible MSM in the SSHS and HIV programme, and this will become far more common in years to come.

During the pilot, excluding clinics with known poor quality of data recording, around 50% of eligible MSM initiated HPV vaccination and less than 5% refused vaccination (10). Along with other factors evaluated during the pilot (11), this evidence of uptake and acceptability supported the decision to proceed to a phased national rollout of a HPV vaccination programme for MSM attending SSHS and HIV clinics from April 2018 (11, 12). Phased rollout in England was complete by the end of April 2019. This report documents the first year of results following full national rollout in all participating clinics, including data to end December 2019.

The COVID-19 pandemic is known to have impacted the delivery of HPV vaccination to MSM during 2020 and analysis of this is currently ongoing. Provisional findings on the number of HPV vaccine doses delivered during the first national lockdown have been reported to end June 2020 as an early assessment of the impact on sexual health services in England (13).

The vaccine

At the time of writing this report, the recommended vaccination course for use in the programme for MSM (aged 15 years and above) is 3 doses of the quadrivalent vaccine (Gardasil®), ideally administered within one year. However, it is clinically acceptable to administer the course over a period of 2 years. Second and third doses should be given at least 1 month and 3 months after the first and second doses, respectively. This schedule allows for opportunistic delivery of the vaccine as per the British Association for Sexual Health and HIV (BASHH) recommended attendance of MSM in SSHS (all sexually active MSM advised to be tested for STIs annually, and high-risk MSM to be tested every 3 months).

Aims

This report provides an update on HPV vaccination uptake (first dose initiation and second and third dose completion) in SSHS and HIV clinics to end December 2019. Data includes pilot clinics implementing vaccination from June 2016 and clinics joining the programme as part of the national rollout from April 2018 to April 2019.

Methods

Data collection

Vaccination uptake and completion in SSHS and HIV clinics have been monitored since the start of the HPV MSM pilot via 2 pre-existing surveillance and reporting systems: the GUMCAD STI Surveillance System (GUMCAD) for SSHS and the HIV and AIDS Reporting System version 1.2 (HARS) for HIV clinics.

SSHS

GUMCAD is a mandatory reporting system that collects disaggregate records of all consultations, tests and diagnoses at all specialist (SSHS and integrated SSHS/sexual and reproductive health services) services in England. GUMCAD also collects and records data from non-specialist (sexual and reproductive health services, young people's services, internet sexual health services and enhanced general practice) services: these are not sites for the delivery of the national HPV vaccination programme for MSM and are not included in this report. These data have been submitted to GUMCAD on a quarterly basis from 2008, with all clinics reporting from 2009. HPV vaccination uptake is recorded using Sexual Health and HIV Activity Property Type (SHHAPT) codes W1, W2 and W3 for first, second and third doses, respectively. Additionally, W4 records if vaccination was offered and declined and W5 records if the vaccine was not offered due to being previously received in full.

HIV clinics

HARS is a mandatory reporting system that collects data on all patients diagnosed with HIV infection attending NHS HIV outpatient services in England since 2008. HARS is a consultation-based, disaggregate dataset submitted to PHE quarterly. Two HPV vaccination reporting fields OfferStatusHPV and HPVDoseGiven are recorded in HARS v1.2. Currently 92% of active sites have incorporated HARSv1.2 into working systems. OfferStatusHPV is coded as follows:

- 01: offered and undecided
- 02: offered and declined
- 03: offered and accepted
- 05: not offered as HPV vaccination was previously received in full
- 06: not offered (other reason)
- 09: not known (not recorded)

HPVDoseGiven is coded 1, 2, and 3, which captures first, second and third HPV vaccination dose, respectively. During the HPV MSM pilot, bespoke collection of these

fields was implemented at participating clinics because integration of vaccination codes into HARS v1.2 was not yet complete at that time. Bespoke data from pilot HIV clinics were merged to routine HARS data using a unique clinic-specific patient identifier.

Data analysis

Clinic selection and start dates

Data were extracted from the start date of vaccination for each clinic reporting to GUMCAD (SSHS and HIV clinics) and for each clinic reporting to HARS (HIV only clinics) to 31 December 2019. Programme start dates were collected by local areas via NHS England due to different clinics implementing vaccination to eligible MSM at different times. The earliest start date was 6 June 2016 for pilot clinics and 1 April 2018 for all other clinics.

The national HPV vaccination programme was rolled out on a phased basis between April 2018 and April 2019, with individual clinics starting to offer the vaccine to eligible MSM at different times. The start date was taken as the date that HPV vaccination of MSM was first recorded in GUMCAD/HARS unless a later programme implementation start date for a SSHS and/or HIV clinic had been provided by local areas via NHS England (ie to exclude data for periods prior to starting the programme when some vaccinations had nevertheless been delivered). Clinics with no doses recorded in GUMCAD or HARS were therefore excluded from the analysis: this means data about attendances and denominators may be different to those in other GUMCAD or HARS outputs.

Vaccine uptake

Eligible individuals were defined as MSM aged up to and including 45 years attending a SSHS or HIV clinic on or after the implementation start date at the clinic. In GUMCAD, MSM were defined as male clinic attendees who had self-reported as being gay or bisexual at any point (that is, at any attendance at the same clinic since 2008). MSM in HARS were defined as male clinic attendees aged up to and including 45 years who had a route of exposure recorded as sex between males. MSM who had initiated vaccination prior to the start of the pilot were excluded from the analysis. Vaccination initiation was calculated as the proportion of eligible MSM with a recorded first HPV vaccine dose. Second dose completion was calculated as the proportion of eligible MSM with a first dose who had a second dose recorded. Third dose completion was defined as the proportion of eligible MSM with a first, second and third dose recorded. Vaccination refusal was determined as an individual with a refusal code and no recorded vaccination doses.

Initiation figures for each data collection system were stratified by:

- age group
- HIV status (for SSHS; defined as known HIV positive for MSM with a positive HIV diagnosis and/or attendance for HIV care, and HIV negative or unknown for MSM with no HIV code recorded)
- clinic geographical type (‘Urban major conurbation’, ‘Urban city and town’ and ‘Rural village and dispersed’ based on the classification of the lower super output area of the clinic)
- ethnicity
- patient residence Index of Multiple Deprivation (IMD)
- country of birth

Results are presented by calendar year: initiation figures from 2016 and 2017 represent pilot clinics only. Stratified results are presented for the full data period. It is currently not possible to deduplicate data from HARS and GUMCAD to report uptake at all sites combined.

Results

Implementation timelines at SSHS and HIV clinics

Of a total 227 SSHS across England, 175 (77.1%) had started vaccination by the end of April 2019 during national rollout. Of these, 23 (10.1%) clinics originally participated in the pilot programme. An additional 35 (16.4%) clinics began reporting later in 2019. Of 182 HIV clinics active since the start of the pilot programme across England, 95 (52.2%) had started implementation by the end of April 2019. Four (2.2%) of these participated in the pilot programme. A further 31 clinics started vaccination by the end of 2019. Overall 93% (210/227) of SSHS and 69% (126/182) of HIV services have reported vaccination activity. 17 SSHS and 56 HIV clinics were excluded from the analysis due to having no recorded vaccination doses in GUMCAD or HARS.

Vaccination uptake in SSHS clinics

Overall recorded vaccination initiation figures in eligible MSM attending SSHS by calendar year are reported in Table 1. In 2019, overall first dose initiation was 33.7% (36,016/106,835). Initiation decreased with increasing age, with the highest figures seen in MSM aged 25 years or younger, at 38.1% (12,583/33,031). Recorded refusal of vaccination in all SSHS was 1.7% (1,813/106,835) in 2019. The remainder of eligible MSM in 2019, 64.5% (68,926/106,835) had no HPV MSM vaccination code recorded (Table 1).

Initiation figures in eligible MSM were stratified by age and HIV status (Appendix 1). First dose initiation was 39.4% (8,578/21,747) in known HIV positive MSM attending SSHS compared to 41.0% (64,569/157,535) in HIV negative MSM or MSM with unknown HIV status attending SSHS. The highest first dose initiation was recorded in the youngest HIV positive MSM (aged 25 years or younger), at 46.1% (919/1,992) (Appendix 1). Recorded initiation stratified by clinic geography and patient ethnicity, IMD and country of birth are presented in Appendix 2.

Across all years, refusal of vaccination was 1.8% (3,304/179,282) and did not differ considerably by age. The overall proportion of MSM offered and declining vaccination was lowest in HIV positive MSM at 0.6% (133/21,747) (Appendix 1). 2.0% of eligible MSM were not vaccinated as they were reported as having already received vaccination in full (3,593/179,282). The remainder of eligible MSM, 50.6% (90,693/179,282), had no HPV MSM vaccination code recorded (Table 2).

Table 1. Initiation of HPV vaccination in SSHS clinics by calendar year (6 June 2016 to 31 December 2019)

	2016 (pilot only)		2017 (pilot only)		2018		2019	
	Attending MSM	Vaccinated with first dose (%)	Attending MSM	Vaccinated with first dose (%)	Attending MSM	Vaccinated with first dose (%)	Attending MSM	Vaccinated with first dose (%)
All ages	13,554	4,736 (34.9%)	36,134	15,318 (42.4%)	60,921	17,019 (27.9%)	106,835	36,016 (33.7%)
<25	3,208	1,199 (37.4%)	9,347	4,298 (46.0%)	16,518	5,380 (32.6%)	33,031	12,583 (38.1%)
26 to 30	3,043	1,108 (36.4%)	8,481	3,589 (42.3%)	15,052	4,185 (27.8%)	26,481	9,032 (34.1%)
31 to 35	2,783	953 (34.2%)	7,264	3,111 (42.8%)	12,642	3,391 (26.8%)	20,779	6,608 (31.8%)
36 to 40	2,404	779 (32.4%)	6,111	2,494 (40.8%)	9,754	2,466 (25.3%)	15,756	4,782 (30.4%)
41 to 45	2,116	697 (32.9%)	4,931	1,826 (37.0%)	6,955	1,597 (23.0%)	10,788	3,011 (27.9%)
	2016 (pilot only)		**2017 (pilot only)**		**2018**		**2019**	
All ages	**Attending MSM**	**No recorded doses**	**Attending MSM**	**No recorded doses**	**Attending MSM**	**No recorded doses**	**Attending MSM**	**No recorded doses**
Offered vaccine and declined (%)	13,554	328 (2.4%)	36,134	1,290 (3.6%)	60,921	1,225 (2.0%)	106,835	1,813 (1.7%)
No HPV-MSM vaccination code (%)	13,554	8,286 (61.1%)	36,134	19,213 (53.2%)	60,921	42,442 (69.7%)	106,835	68,926 (64.5%)

Vaccination Completion in SSHS clinics

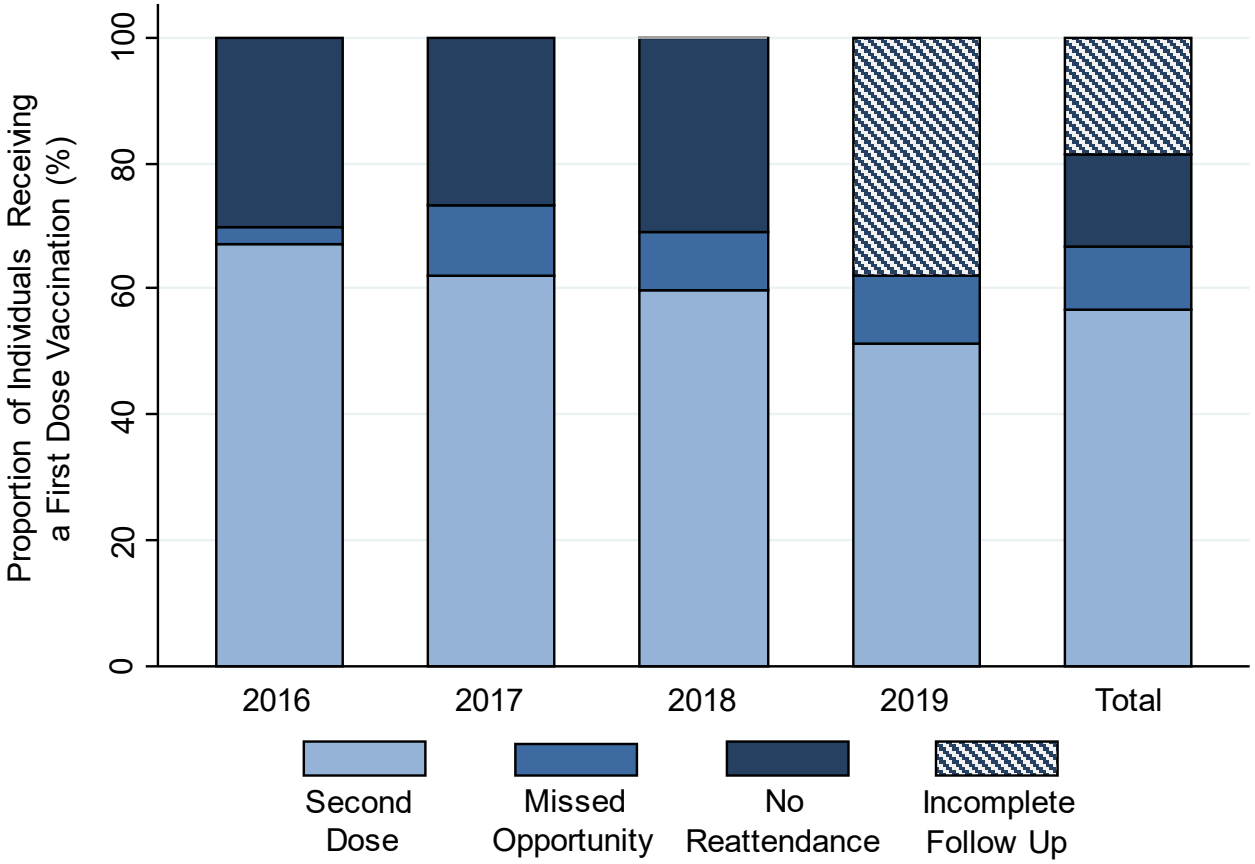
Among MSM who received a first dose, completion of second and third doses was 56.5% (41,336/73,147) and 27.2% (19,875/73,147), respectively, by end of December 2019. Second dose completion was higher among MSM who had between 1 to 12 months of follow-up time since their first dose, at 61.7% (22,847/37,059). Again, third dose completion was higher among MSM who had between 3 to 12 months of follow-up time since their second dose, at 61.6% (11,732/19,037). Among those receiving a second dose, 46.9% (22,867/48,750) had received a third dose. Second and third dose completion has therefore continued to accrue on target with clinically recommended intervals between vaccination doses (that is, second dose at least 1 month after first and third dose at least 3 months after second).

However, figures showed some evidence of missed opportunities to deliver second and third doses to MSM attending within the window for recommended vaccination. Of the 31,811 MSM who have received a first dose but not a second dose, 7,320 (23.0%) had attended a clinic within 2 to 12 months after receiving their first dose. Similarly, 2,936 (15.2%) patients who received a second dose but not a third dose had subsequently attended a clinic 3 to 12 months after receiving their second dose. Outcomes by attendee after initiation of vaccination by year the first dose was received are shown in Figure 1. Approximately 60% received a second dose each year. Between 2017 and 2019, 3 to 11% of individuals reattended the same clinic but did not receive a subsequent dose, representing a missed opportunity for vaccination. Between 2016 and 2018, 27 to 31% of individuals did not reattend the same clinic within 12 months of their first dose.

Table 2. Summary of doses in SSHS clinics (6 June 2016 to 31 December 2019)

Total eligible attendees	179,282
No HPV vaccination code	90,693 (50.6%)
Declined vaccination	3,304 (1.8%)
Vaccine not offered as previously received in full	3,593 (2.0%)
Total first doses	73,147
Proportion of eligible attendees receiving first dose (%)	**40.8**
Second dose completion	41,336 (56.5%)
Second dose given within 60 days of first vaccination	22,228
Proportion of second doses given within 60 days (%)	**53.8**
Second dose given between 60 to 365 days of first vaccination	16,010
Proportion of second doses given between 60 to 365 days (%)	**38.7**
Second dose coded without first dose	7,414
Third dose completion	19,875 (27.2%)
Third dose given within 180 days of second vaccination	15,781
Proportion of third doses given within 180 days (%)	**79.4**
Third dose given between 180 to 730 days of second vaccination	3,846
Proportion of third doses given between 180 to 730 days (%)	**19.4**
Third dose coded without first and/or second dose	9,149

Figure 1. Patient outcomes following first dose vaccination by year in SSHS clinics (6 June 2016 to 31 December 2019)



A missed opportunity for (second dose) vaccination is defined as an attendance at the same clinic between 1 to 12 months after the first vaccination, with no second dose administration recorded. Individuals receiving a second vaccination dose at a different clinic will not be linked to their first dose and therefore classed as not reattending. Period of follow-up time was used as 12 months since first dose was received.

Vaccination uptake in HIV clinics

Overall recorded vaccination initiation figures in eligible MSM attending HIV clinics by calendar year are reported in Table 3. In 2019, overall first dose initiation was 18.0% (456/2,528). As in SSHS, initiation decreased with increasing age: 23.1% (74/320) MSM aged 25 years or younger received a first dose in 2019. Recorded refusal of vaccination in all HIV clinics overall was 4.1% (104/2,528) in 2019. The remainder of eligible MSM in 2019, 77.2% (1,952/2,528) had no HPV MSM vaccination code recorded (Table 3).

Vaccination initiation in MSM attending HIV clinics between pilot start (earliest 6 June 2016) and end December 2019 was 36.2% (1,345/3,719) (Table 4). Overall recorded refusal of vaccination in HIV clinics was 3.2% (120/3,719). Among all attending MSM, 8.6% (318/3,719) were reported as previously receiving vaccination in full. The proportion of eligible MSM with no HPV MSM vaccination code recorded was 42.7% (1,589/3,719). Recorded initiation in HIV clinics stratified by clinic geography and patient ethnicity, IMD and country of birth are reported in Appendix 4.

Table 3. Initiation of HPV vaccination in HIV clinics by calendar year (6 June 2016 to 31 December 2019)

	2016 (pilot only)		2017 (pilot only)		2018		2019	
	Attending MSM	Vaccinated with first dose (%)	Attending MSM	Vaccinated with first dose (%)	Attending MSM	Vaccinated with first dose (%)	Attending MSM	Vaccinated with first dose (%)
All ages	458	419 (91.5%)	1,062	327 (30.8%)	1,267	143 (11.1%)	2,528	456 (18.0%)
<25	46	43 (93.5%)	91	31 (34.1%)	139	25 (18.0%)	320	74 (23.1%)
26 to 30	80	72 (90.0%)	156	47 (30.1%)	239	31 (13.0%)	577	123 (21.3%)
31 to 35	112	100 (89.3%)	253	96 (37.9%)	296	39 (13.2%)	568	104 (18.3%)
36 to 40	112	103 (92.0%)	263	76 (28.9%)	293	28 (9.6%)	576	97 (16.8%)
41 to 45	108	101 (93.5%)	299	77 (25.8%)	299	20 (6.7%)	486	58 (11.9%)
	2016 (pilot only)		**2017 (pilot only)**		**2018**		**2019**	
All ages	**Attending MSM**	**No recorded doses**	**Attending MSM**	**No recorded doses**	**Attending MSM**	**No recorded doses**	**Attending MSM**	**No recorded doses**
Offered vaccine and declined (%)	458	27 (5.9%)	1,062	28 (2.6%)	1,267	43 (3.4%)	2,528	104 (4.1%)
No HPV-MSM vaccination code (%)	458	<5	1,062	700 (65.9%)	1,267	1,066 (84.1%)	2,528	1,952 (77.2%)

Vaccination Completion in HIV clinics

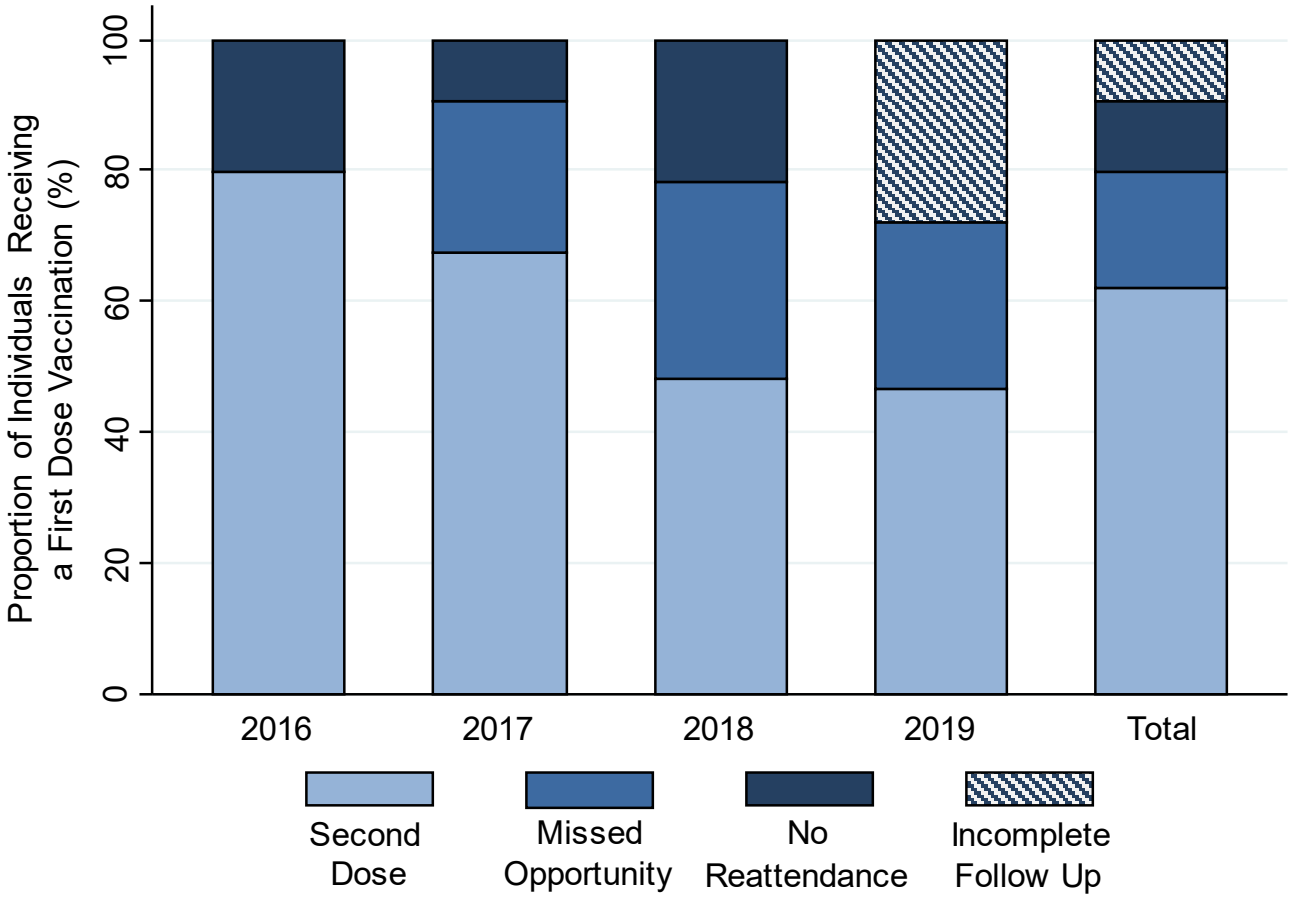
Among MSM attending HIV clinics who received a first dose, completion of second and third doses was 62.2% (836/1,345) and 34.8% (468/1,345), respectively, by end of December 2019 (Table 4). As in SSHS, second dose completion was higher among MSM who had between 1 to 12 months of follow-up time since their first dose, at 70.1% (624/889). Again, third dose completion was higher among MSM who had between 3 to 12 months of follow-up time since their second dose, at 66.8% (397/594). Among those receiving a second dose, 51.8% (577/1,076) had received a third dose. Second and third dose completion has therefore continued to accrue on target with clinically recommended intervals between vaccination doses (that is, second dose at least 1 month after first and third dose at least 3 months after second).

However, there is evidence of missed opportunities to deliver second and third doses to MSM attending HIV clinics within the window for recommended vaccination. Of the 507 MSM who have received a first dose but not a second dose, 235 (46.2%) had reattended the same clinic within 2 to 12 months of receiving their first dose. Similarly, 126 (25.3%) of the 499 patients who received a second dose but not a third dose had subsequently reattended 3 to 12 months after receiving their second dose. Figure 2 indicates there were no missed opportunity attendances in 2016. However, between 2017 and 2019, 23 to 30% of individuals receiving a first dose subsequently reattended the same clinic without having a second dose recorded. A further 22% of individuals did not reattend the same clinic within 12 months of receiving their first vaccine dose in 2018.

Table 4. Summary of doses in HIV clinics (6 June 2016 to 31 December 2019)

Total eligible attendees	3,719
No HPV vaccination code	1,589 (42.7%)
Declined vaccination	120 (3.2%)
Vaccine not offered as previously received in full	318 (8.6%)
Total first doses	1,345
Proportion of eligible attendees receiving first dose (%)	**36.2**
Second dose completion	836 (62.2%)
Second dose given within 60 days of first vaccination	511
Proportion of second doses given within 60 days (%)	**61.1**
Second dose given between 60 to 365 days of first vaccination	319
Proportion of second doses given between 60 to 365 days (%)	**38.2**
Second dose coded without first dose	240
Third dose completion	468 (34.8%)
Third dose given within 180 days of second vaccination	328
Proportion of third doses given within 180 days (%)	**70.1**
Third dose given between 180 to 730 days of second vaccination	139
Proportion of third doses given between 180 to 730 days (%)	**29.7**
Third dose coded without first and/or second dose	336

Figure 2. Patient outcomes following first dose vaccination by year in HIV clinics (6 June 2016 to 31 December 2019)



A missed opportunity for (second dose) vaccination is defined as an attendance at the same clinic between 1 to 12 months after the first vaccination, with no second dose administration recorded. Individuals receiving a second vaccination dose at a different clinic will not be linked to their first dose and therefore classed as not reattending. Period of follow-up time was used as 12 months since first dose was received.

Discussion

Following the transition of HPV vaccination for MSM from pilot to national programme, we continue to monitor HPV vaccination uptake (initiation and completion) using routine surveillance data collections at SSHS and HIV clinics. Now that phased rollout is complete, this surveillance includes all clinics that have implemented vaccination as part of the national programme. [Note: Those clinics who have not reported any HPV vaccination activity for MSM are being contacted.]

In 2019, 34% of MSM attending SSHS services were recorded as having initiated the HPV vaccination course. In HIV services initiation was 18% in 2019. Between pilot start and end December 2019, around 41% of MSM attending SSHS (N=179,282) and 36% attending HIV services (N=3,719) had initiated the HPV vaccination course. Using a NATSAL estimate of the total MSM population in England (ie defined as reporting at least one male sexual partner in the past 5 years), approximately 26% (73,147/280,507) of MSM aged 16 to 45 in England have initiated HPV vaccination in SSHS via the HPV vaccination programme for MSM (14). With the target population for the programme estimated as the 33% of MSM who regularly attend sexual health clinics (9), our data suggest well over 50% of this target population have initiated vaccination.

Data to end June 2020 from the national HPV vaccination programme in Scotland show an uptake of 65% in sexual health clinics, considerably higher than that reported in England. Second dose completion in Scotland however was 52%, in line with figures reported in SSHS in England (15). Recorded second and third dose completion among MSM who received a first dose was 57% and 27%, respectively. At HIV clinics, course completion was higher, at over 62% (second dose) and 35% (third dose) among MSM who had received a first dose. Results to date have shown that completion has accrued broadly on target with clinically recommended intervals between vaccination doses, though with some evidence of opportunities to give second and third doses being missed.

Refusals among MSM remain low at under 5%. As at end 2019 approximately 2% of attendees at SSHS and 8% at HIV clinics reported previously receiving vaccination in full. Missed opportunities for second doses occurred for around 10% of SSHS attendees who had received a first dose and 30% of HIV clinic attendees, indicating there is scope for improvement of second and third dose completion. Around 30% of individuals who received a first dose vaccination in 2018 did not reattend the clinic within 12 months of receiving their first dose, highlighting the benefits of a flexible schedule which allows second and third doses to be given up to 24 months after the first dose.

The proportion of eligible MSM with no HPV vaccination code recorded remains high (approximately 40 to 50% depending on clinic type). As noted in previously published reports, incomplete use of codes to record the offer or act of vaccination may still be a

contributing factor, despite past webinars offered in SSHS to improve data recording of vaccination for MSM (10). Ongoing upgrades to both surveillance systems (new GUMCAD specification and HARS v1.2) may also have contributed to delays in accurate HPV vaccination recording. This is evidenced by the observed drop in recorded initiation in HIV clinics, from over 90% in 2016 when a bespoke collection system was used, to just over 10% in 2018.

The surveillance systems used for these analyses include a number of limitations and caveats. Firstly, GUMCAD and HARS collect data on gender and sexual orientation only. For this analysis, attendees were identified as eligible for vaccination if their sexual orientation was recorded as homosexual or bisexual at any visit in their clinic attendance history. At most clinics, these data are likely to reflect a patient's sexual behaviour (rather than their sexual identity). However, assessment of sexual risk at clinic level may differ, and could therefore lead to underestimation or overestimation of vaccination uptake due to errors in denominator.

Additionally, in clinics reporting to GUMCAD, patient identifiers are unique within each clinic and patients cannot be tracked between clinics. HPV vaccination completion therefore cannot be monitored across clinics. For the purposes of second and third dose completion analyses in this report, the assumption was made that most attendees will attend the same clinic rather than move between clinics. However, to date there have been 7,414 second doses without a first and 9,149 third doses without a first or second dose recorded at SSHS. If these indicate completion of courses started in other clinics the overall completion rate (3 doses) increases by 12.5% to 39.7%. Finally, results could not be deduplicated between GUMCAD and HARS attendees, and there may therefore be some overlap between MSM attending SSHS and HIV services. As a result, total number of attendances and/or doses delivered will not be the sum of reported data from SSHS and HIV clinics.

Conclusions and future work in progress

Vaccination initiation, and second and third dose completion, in MSM attending SSHS and HIV services to end 2019 is similar to previous years though has yet to show substantial improvement. Missing data about the offer of, and uptake of, HPV vaccination continues to be a major limitation. Even so, the overall recorded uptake within the target group is accruing well. Work is currently underway to identify outstanding causes for apparent low uptake, and factors associated with low uptake. This will include running clinic-specific audits of HPV vaccination data for eligible MSM. Further actions to improve data recording will be considered with clinicians and other stakeholders in SSHS and HIV clinics for all vaccinations for MSM (including Hepatitis A, Hepatitis B and HPV).

The COVID-19 pandemic is expected to impact HPV MSM vaccination uptake further, and future analyses will closely monitor any evidence of missed doses or incomplete vaccination courses. PHE has launched initiatives with its partners to mitigate the detrimental impact of COVID-19 on STI services and work is ongoing to address this in years to come (13).

Surveillance activities will continue to evaluate the HPV vaccination programme for MSM against its expected aims to improve health outcomes in this at-risk population. This includes the planned collection of residual serum specimens from MSM attending SSHS for HIV and/or syphilis testing to check immunological evidence of immunisation by unlinked anonymous HPV antibody testing (type-specific for HPV 16/18). Further to baseline studies of HPV in MSM (16, 17) a follow-up collection of residual rectal specimens from MSM attending SSHS for chlamydia testing will be tested for type-specific HPV DNA prevalence to estimate the impact of vaccination on HPV infection. Genital warts diagnoses will also be monitored using GUMCAD data as a measure of impact on this early disease outcome. Impact of vaccination on anal cancers and precancerous lesions are not expected for several years: analyses of these outcomes will be considered in due course.

References

1. IARC Working Group on the Evaluation of Carcinogenic Risks to Humans. Chapter 6, Human papillomaviruses. A Review of Human Carcinogens. Part B: Biological Agents.: Lyon, France: IARC.; 2009.

2. Giuliano AR, Nyitray AG, Kreimer AR, Pierce Campbell CM, Goodman MT, Sudenga SL, et al. EUROGIN 2014 roadmap: differences in human papillomavirus infection natural history, transmission and human papillomavirus-related cancer incidence by gender and anatomic site of infection. Int J Cancer. 2015;136(12):2752-60.

3. Group IW. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans. Lyon, France; 2007.

4. Muñoz N, Castellsague X, Berrington de Gonzalez A, Gissmann L. Chapter 1: HPV in the etiology of human cancer. Vaccine. 2006;24(S3):1-10.

5. Public Health England. Human papillomavirus (HPV): the green book, chapter 18a. 2019.

6. Sturegard E, Johansson H, Ekstrom J, Hansson BG, Johnsson A, Gustafsson E, et al. Human papillomavirus typing in reporting of condyloma. Sex Transm Dis. 2013;40(2):123- 9.

7. Palefsky J. Human papillomavirus-related disease in people with HIV. Current opinion in HIV and AIDS. 2009;4(1):52-6.

8. Joint Committee on Vaccination and Immunisation. JCVI statement on HPV vaccination of men who have sex with men. 2015.

9. Lin A, Ong KJ, Hobbelen P, King E, Mesher D, Edmunds WJ, et al. Impact and Costeffectiveness of Selective Human Papillomavirus Vaccination of Men Who Have Sex With Men. Clin Infect Dis. 2017;64(5):580-8.

10. Checchi M, Mesher D, McCall M, Coukan F, Chau C, Mohammed H, et al. HPV vaccination of gay, bisexual and other men who have sex with men in sexual health and HIV clinics in England: vaccination uptake and attendances during the pilot phase. Sex Transm Infect. 2019. HPV vaccination uptake in MSM National programme: 2018 Annual Report 28.

11. Public Health England. Human papillomavirus vaccination for men who have sex with men: year 1 evaluation report. 2017.

12. Edelstein M, Iyanger N, Hennessy N, Mesher D, Checchi M, Soldan K, et al. Implementation and evaluation of the human papillomavirus (HPV) vaccination pilot for men who have sex with men (MSM), England, April 2016 to March 2017. Eurosurveillance. 2019;24(8):1800055.

13. Public Health England. The impact of the COVID-19 pandemic on prevention, testing, diagnosis and care for sexually transmitted infections, HIV and viral hepatitis in England, Provisional data: January to September. 2020.

14. Mercer, C.H., et al., Changes in sexual attitudes and lifestyles in Britain through the life course and over time: findings from the National Surveys of Sexual Attitudes and Lifestyles (Natsal). Lancet, 2013. 382(9907): p. 1781-1794.

15. Public Health Scotland. HPV Vaccination Statistics for Men who have Sex with Men, Scotland, 3 year period ending 30 June 2020. 2020.

16. Checchi M, Mesher D, Panwar K, Beddows S, Turner K, Hickman M, Soldan K. Prevalence of HPV infection in MSM attending Specialist Sexual Health Services in England prior to widespread HPV vaccination for MSM. 2020.

17. King EM, Gilson R, Beddows S, Soldan K, Panwar K, Young C, et al. Human papillomavirus DNA in men who have sex with men: type-specific prevalence, risk factors and implications for vaccination strategies. Br J Cancer. 2015;112(9):1585-93.

Appendices

Appendix 1. Initiation of HPV vaccination stratified by age and HIV status in SSHS (6 June 2016 to 31 December 2019)

	Patient HIV status	All ages	≤25	26 to 30	31 to 35	36 to 40	41 to 45
Attending MSM	All attending MSM	**179,282**	**53,756**	**44,083**	**35,197**	**26,642**	**19,564**
Vaccinated with first dose		73,147 (40.8%)	23,461 (43.6%)	17,917 (40.6%)	14,065 (40.0%)	10,524 (39.5%)	7,161 (36.6%)
Unvaccinated							
Previously received in full		3,593 (2.0%)	917 (1.7%)	884 (2.0%)	713 (2.0%)	663 (2.5%)	416 (2.1%)
Offered vaccine and declined		3,304 (1.8%)	1,145 (2.1%)	851 (1.9%)	613 (1.7%)	428 (1.6%)	267 (1.4%)
No HPV-MSM vaccination code		90,693 (50.6%)	25,949 (48.3%)	22,278 (50.5%)	18,002 (51.1%)	13,689 (51.4%)	10,754 (55.0%)
Attending MSM	HIV negative	**157,535**	**51,764**	**40,122**	**30,178**	**21,225**	**14,225**
Vaccinated with first dose		64,569 (41.0%)	22,542 (43.5%)	16,242 (40.5%)	12,007 (39.8%)	8,397 (39.6%)	5,378 (37.8%)
Unvaccinated							
Previously received in full		2,956 (1.9%)	834 (1.6%)	751 (1.9%)	577 (1.9%)	511 (2.4%)	283 (2.0%)
Offered vaccine and declined		3,171 (2.0%)	1,121 (2.2%)	825 (2.1%)	584 (1.9%)	398 (1.9%)	243 (1.7%)
No HPV-MSM vaccination code		80,198 (50.9%)	25,191 (48.7%)	20,533 (51.2%)	15,675 (51.9%)	11,044 (52.0%)	7,737 (54.4%)

Attending MSM	HIV positive	**21,747**	**1,992**	**3,961**	**5,019**	**5,417**	**5,339**
Vaccinated with first dose		8,578 (39.4%)	919 (46.1%)	1,675 (42.3%)	2,058 (41.0%)	2,127 (39.3%)	1,783 (33.4%)
Unvaccinated							
Previously received in full		637 (2.9%)	83 (4.2%)	133 (3.4%)	136 (2.7%)	152 (2.8%)	133 (2.5%)
Offered vaccine and declined		133 (0.6%)	24 (1.2%)	26 (0.7%)	29 (0.6%)	30 (0.6%)	24 (0.4%)
No HPV-MSM vaccination code		10,495 (48.3%)	810 (40.7%)	1,807 (45.6%)	2,404 (47.9%)	2,723 (50.3%)	3,091 (57.9%)

Appendix 2. Vaccination initiation in SSHS by sociodemographic and clinic geography stratifications (6 June 2016 to 31 December 2019)

Stratification	Uptake
Clinic urban or rural classification	
Urban major conurbation	48,029/124,751 (38.5%)
Urban city and town	22,131/48,679 (45.5%)
Rural village and dispersed	756/1,256 (60.2%)
Missing classification	881/1,647 (53.5%)
Ethnicity	
Asian or Asian British	4,142/10,071 (41.1%)
Black or Black British	2,795/7,651 (36.5%)
Mixed	3,192/8,005 (39.9%)
Other ethnic groups	3,255/8,123 (40.1%)
White	53,864/126,566 (42.6%)
Not specified	5,899/18,866 (31.3%)
IMD	
Least deprived quintile	6,637/15,575 (42.6%)
Second least deprived quintile	9,795/23,375 (41.9%)
Middle quintile	14,224/35,112 (40.5%)
Second most deprived quintile	23,531/58,814 (40%)
Most deprived quintile	18,531/45,591 (40.6%)
Not specified	429/815 (52.6%)
Country of birth	
UK born	45,570/103,181 (44.2%)
Born outside the UK	21,569/54,674 (39.5%)
Not specified	6,008/21,427 (28.0%)

Appendix 3. Initiation of HPV vaccination stratified by age in HIV clinics (6 June 2016 to 31 December 2019)

	Patient HIV status	All ages	≤25	26 to 30	31 to 35	36 to 40	41 to 45
Attending MSM	All attending MSM	**3,719**	**454**	**764**	**867**	**841**	**734**
Vaccinated with first dose		1,345 (36.2%)	173 (38.1%)	273 (35.7%)	339 (39.1%)	304 (36.1%)	256 (34.9%)
Unvaccinated							
Previously received in full		318 (8.6%)	32 (7.0%)	80 (10.5%)	66 (7.6%)	85 (10.1%)	55 (7.5%)
Offered vaccine and declined		120 (3.2%)	12 (2.6%)	35 (4.6%)	32 (3.7%)	24 (2.9%)	17 (2.3%)
No HPV-MSM vaccination code		1,589 (42.7%)	169 (37.2%)	280 (36.6%)	352 (40.6%)	356 (42.3%)	373 (50.8%)

Appendix 4. Vaccination initiation in HIV clinics by sociodemographic and clinic geography stratifications (6 June 2016 to 31 December 2019)

Stratification	Uptake
Clinic urban or rural classification	
Urban major conurbation	879/2,390 (36.8%)
Urban city and town	451/1,287 (35.0%)
Rural village and dispersed	11/26 (42.3%)
Ethnicity	
Asian or Asian British	41/145 (28.3%)
Black or Black British	47/178 (26.4%)
Mixed	36/129 (27.9%)
Other ethnic groups	58/135 (43.0%)
White	593/2,145 (27.6%)
Not specified	570/987 (57.8%)
IMD	
Least deprived quintile	89/236 (37.7%)
Second least deprived quintile	145/387 (37.5%)
Middle quintile	184/546 (33.7%)
Second most deprived quintile	496/1,203 (41.2%)
Most deprived quintile	431/1,347 (32.0%)
Country of birth	
UK born	475/1,919 (24.8%)
Born outside the UK	368/1,117 (32.9%)
Not specified	502/683 (73.5%)

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Public Health England
Wellington House
133-155 Waterloo Road
London SE1 8UG
Tel: 020 7654 8000

Website: www.gov.uk/phe
Twitter: @PHE_uk
Facebook: www.facebook.com/PublicHealthEngland

Prepared by: Hannah Milbourn, Marta Checchi, Kate Soldan
For queries relating to this document, please contact: marta.checchi@phe.gov.uk

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