

Annual Return by YFVCs in England, Wales and Northern Ireland: 2023

Executive Summary

This Annual Return (AR) reports the use of yellow fever (YF) vaccine and YF vaccination services in Yellow Fever Vaccination Centres (YFVCs) from 1 January 2023 to 31 December 2023.

Demographics

- At the end of 2023, there were a total of 1,755 designated YFVCs in England, Wales and Northern Ireland (EWNI). This compares with 1,703 designated YFVCs at the end of 2022.
- All 1,755 designated YFVCs were asked to complete an AR, and the response rate was 94.2%.
- Most YF services were provided by pharmacies (53.3%), followed by GP practices (33.2%).
- 1,465 (88.6%) YFVCs reported that all health professionals (HPs) had received NaTHNaC YF training. 33 YFVCs reported that no HPs had received NaTHNaC YF training; all were followed up by NaTHNaC and 1 YFVC was temporarily suspended, as the training requirement under the [Conditions of Designation](#) for YFVCs was not met.

Yellow fever vaccine doses

- 90,499 YF vaccine doses were administered in EWNI. This accounts for less than 0.1% of all UK residents travelling overseas in 2023, and less than 0.4% of UK residents travelling outside of Europe.
- The 18- to 59-year-old age group accounted for the largest proportion of vaccinated individuals (74.9%). Those aged 60 years or older accounted for 8.7% of vaccinated individuals.
- 761 reinforcing doses were given, accounting for less than 1% of all doses given.
- 577 (35%) YFVCs issued Medical Letters of Exemption (MLoEs). In total 3,418 MLoE were issued to travellers; with 35.8% of these being issued to travellers over the age of 60 years where age was a precaution to YF vaccine.
- 8,211 YF vaccines were given to individuals with a precaution to YF vaccine.

Clinical incidents

- 14 YFVCs reported that YF vaccine was given where a contraindication to vaccination was present. Further investigation of these reports by NaTHNaC confirmed 13 as being AR survey completion errors and one as clinically appropriate.
- No suspected yellow fever vaccine associated viscerotropic disease (YEL-AVD) and one yellow fever vaccine associated neurologic disease (YEL-AND) were reported in 2023.

Conditions of Designation and Code of Practice

- 1,620 (98%) responding YFVCs had carried out a best practice review of YF services; 31 (1.9%) were 'unsure' and 2 did not carry out a best practice review.
- 1,628 (98.5%) responding YFVCs used a traveller checklist during the travel health consultation to assist YF risk assessment. Of these, 1,236 (75.9%) YFVCs used the NaTHNaC/Public Health Scotland standardised checklist.
- 1,565 (94.7%) responding YFVCs supplied the YF vaccine Patient Information Leaflet (PIL) routinely to travellers receiving YF vaccination.

Introduction

This report concerns the 2023 Annual Return of yellow fever (YF) vaccine use and practice of Yellow Fever Vaccination Centres (YFVCs) in England, Wales, and Northern Ireland (EWNI).

Methods

A questionnaire (Appendix A) was created using SurveyMonkey online survey software (SurveyMonkey, San Mateo, California, US). YFVCs who had a current designated status between 1 January 2023 and 31 December 2023 were sent a weblink to the survey via multiple channels, including email to YFVC staff, news items on NaTHNaC's website, and social media posts (Facebook, X [formerly known as Twitter]).

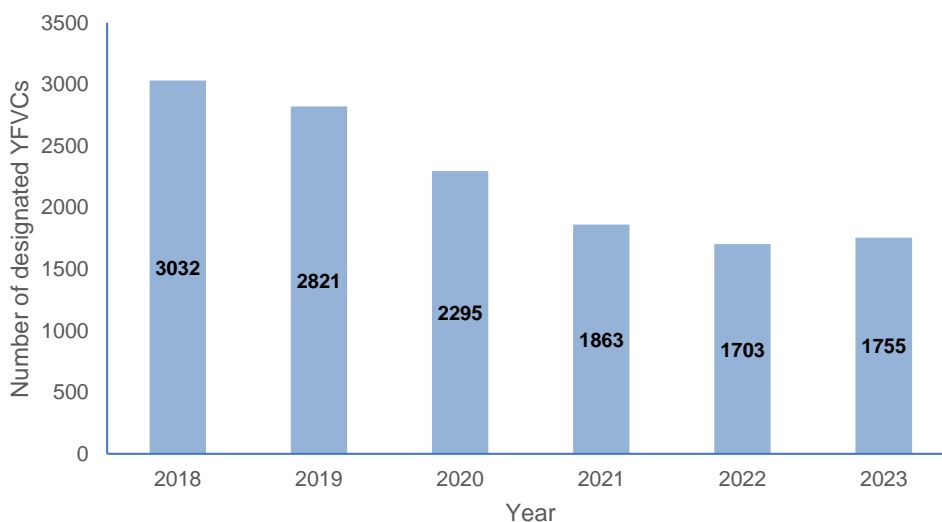
The online questionnaire was open for responses between 22 March and 21 June 2024. Email reminders were sent to non-responding YFVCs at regular intervals.

Data was extracted from SurveyMonkey, cleaned and transformed using various Python packages, mapped using GIS tools, and analysed in Microsoft Excel.

Results

A total of 1,755 YFVCs in EWNI remained designated at the end of 2023. This compares with 1,703 YFVCs at the end of 2022. The number of YFVCs had been declining slowly over time with the biggest proportional decrease in 2020 and 2021, during the time of most significant COVID-19 restrictions (Figure 1). There was a small increase in YFVCs from 2022 to 2023 of 3.1%.

Figure 1: Designated Yellow Fever Vaccination Centres 2018 – 2023



All 1,755 designated YFVCs were invited to complete an AR, with 1,653 responses (response rate of 94.2%). The response rates in the previous five years (2022-2018) were 95.8%, 71%, 88%, 87% and 93% respectively.

i. YFVC characteristics

Responding YFVCs were most commonly pharmacies (53.3%), followed by General Practice (GP) (33.2%), private travel clinics (9.9%), occupational health departments (1.9%) and hospitals (0.5%). Since 2018, there has been a decrease in the proportion of GP YFVCs and an increase in the proportion of pharmacy YFVCs (Figure 2); for the second year in a row, the number of pharmacy YFVCs was greater than GP YFVCs. 9.8% of YFVCs had been registered for less than a year.

The pharmacies are widely distributed across the UK, with the highest concentration in the southern and central regions of England, making them the most accessible and commonly available type of YFVC organisation (Figure 3). General practices have the second highest coverage. Other organisations, such as hospitals, travel clinics, and occupational health departments, have a more limited distribution and are concentrated in specific regions.

Figure 2: Yellow Fever Vaccination Centre organisation type 2018 – 2023

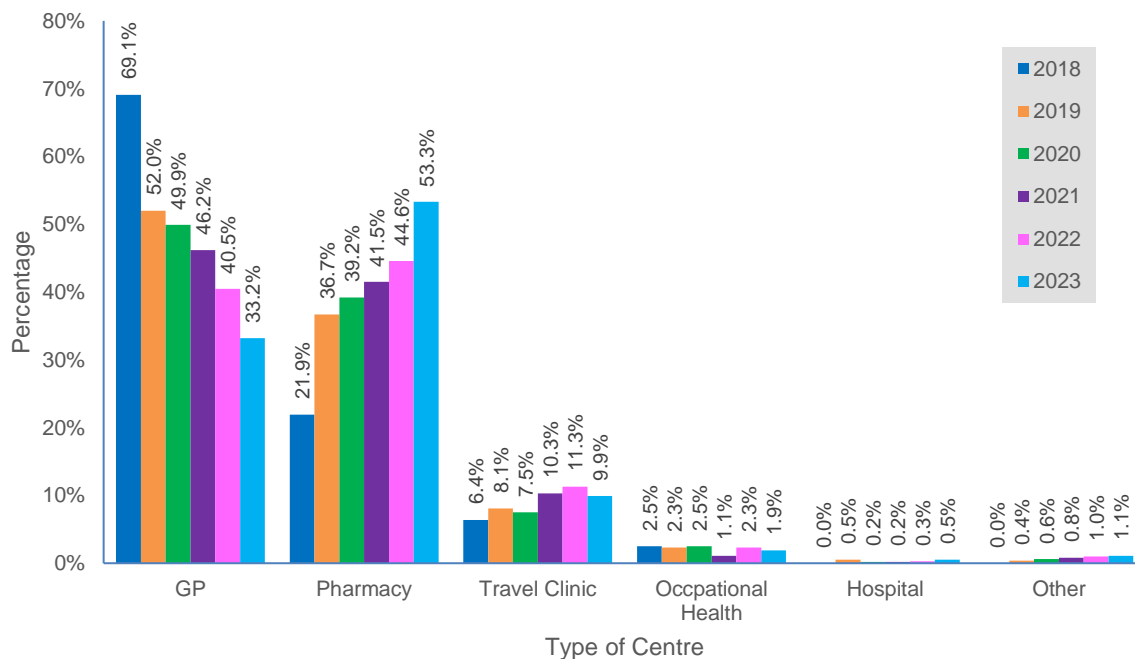
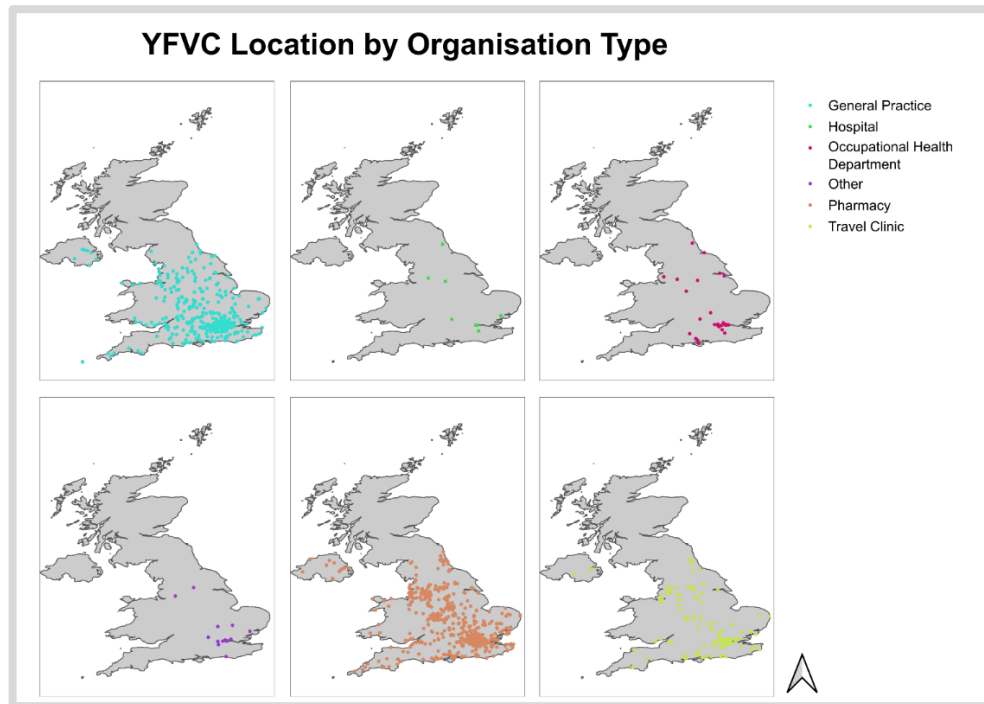


Figure 3: Yellow Fever Vaccination Centre location by organisation type 2023



Most YFVCs had one health professional (HP) administering YF vaccines (range 0 to 31) (Table 1).

Table 1: Number of health professionals administering YF vaccines at YFVC.

Number of health professionals	Number of centres	Percentage (%)
0	20	1.2%
1	806	48.8%
2	518	31.3%
3	180	10.9%
4	70	4.2%
5	19	1.1%
≥6	40	2.4%
Total	1653	100.0%

Of responding YFVCs, 1,465 (88.6%) reported that all HPs administering YF vaccine had received NaTHNaC YF training and 155 (9.4%) reported that some HPs had received YF training. 33 (2%) YFVCs reported that no HPs administering YF vaccine had received NaTHNaC training; all 33 YFVCs were followed up by NaTHNaC and 32 reports were found to be survey completion errors. As a result of follow up, one YFVC was suspended from providing YF vaccination services, as the training requirement under the Conditions of Designation for YFVCs had not been met.

ii. YF vaccine doses administered

90,499 YF vaccine doses were administered by responding YFVCs in EWN1 (Figure 4). This accounts for less than 0.1% of all UK residents travelling overseas in 2023, and less than 0.4% of UK residents travelling outside of Europe¹. 136 (8.2% of responding YFVCs) YFVCs did not administer any YF vaccines; compared with 198 (12.1% of responding YFVCs) YFVCs in 2022 (Table 2).

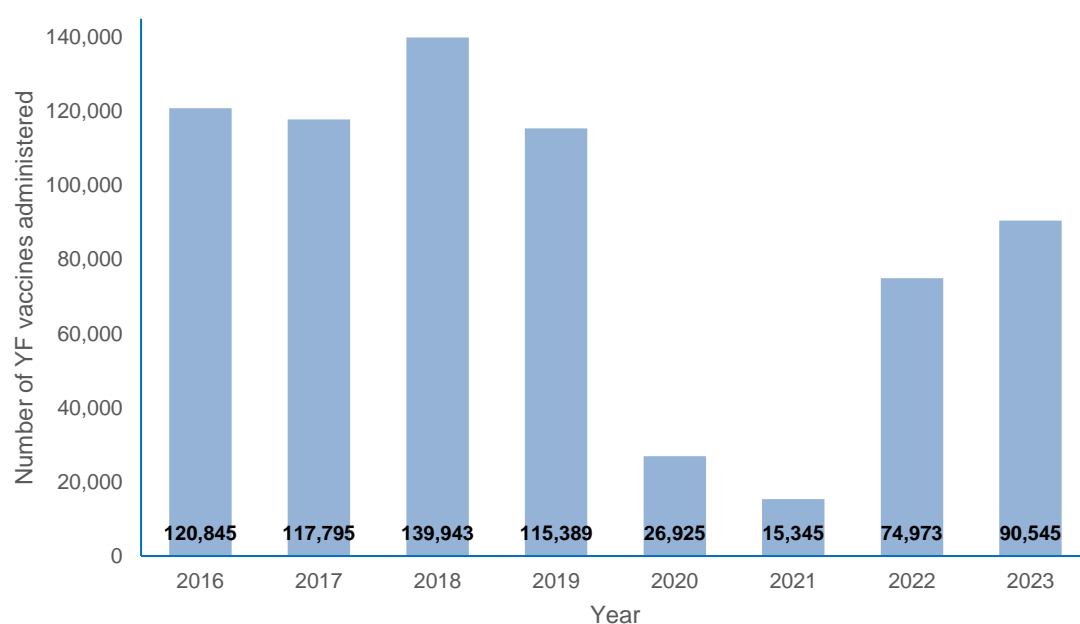
Table 2: Number of doses administered.

Number of doses	Number of YFVCs 2023	Percentage	Number of YFVCs 2022	Percentage
0	136	8.2%	198	12.1%
1-10	359	21.7%	442	27.1%
11-20	302	18.3%	282	17.3%
21-30	178	10.8%	167	10.2%
31-40	110	6.7%	92	5.6%
41+	568	34.3%	450	27.6%
Total	1653	100%	1631	99.9%

There was a 20.7% increase in YF vaccine doses administered in 2023 compared with 2022, when 74,973 doses of YF vaccine were reported as being administered. This corresponds to a 21% increase in visits abroad by UK residents between 2022 and 2023¹.

The number of YF vaccine doses administered in 2023 still represents a 21.6% decrease compared with 2019, when 115,389 doses of the YF vaccine were reported as administered (Figure 4). Although, there were just 7% fewer visits abroad by UK residents in 2023 compared with 2019¹.

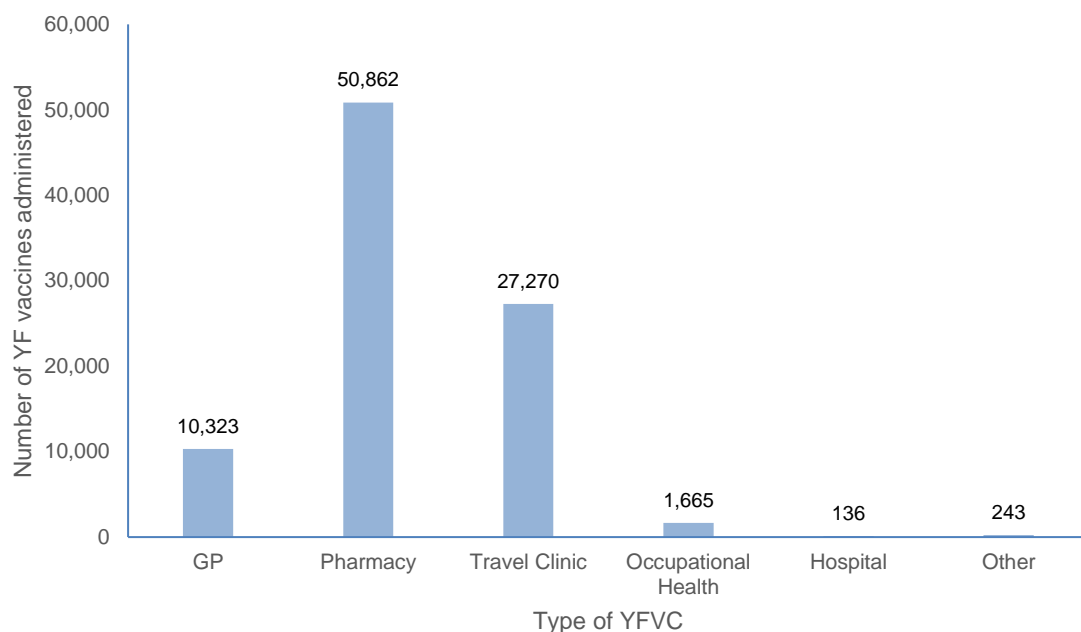
Figure 4: Number of YF vaccines administered 2016-2023



Of the 90,499 YF vaccines administered during 2023, most (56.2%) were given in pharmacies, followed by travel clinics (30.1%) and then General Practice (11.4%) (Figure 5).

¹ Office for National Statistics (2024) Travel Trends: 2023.

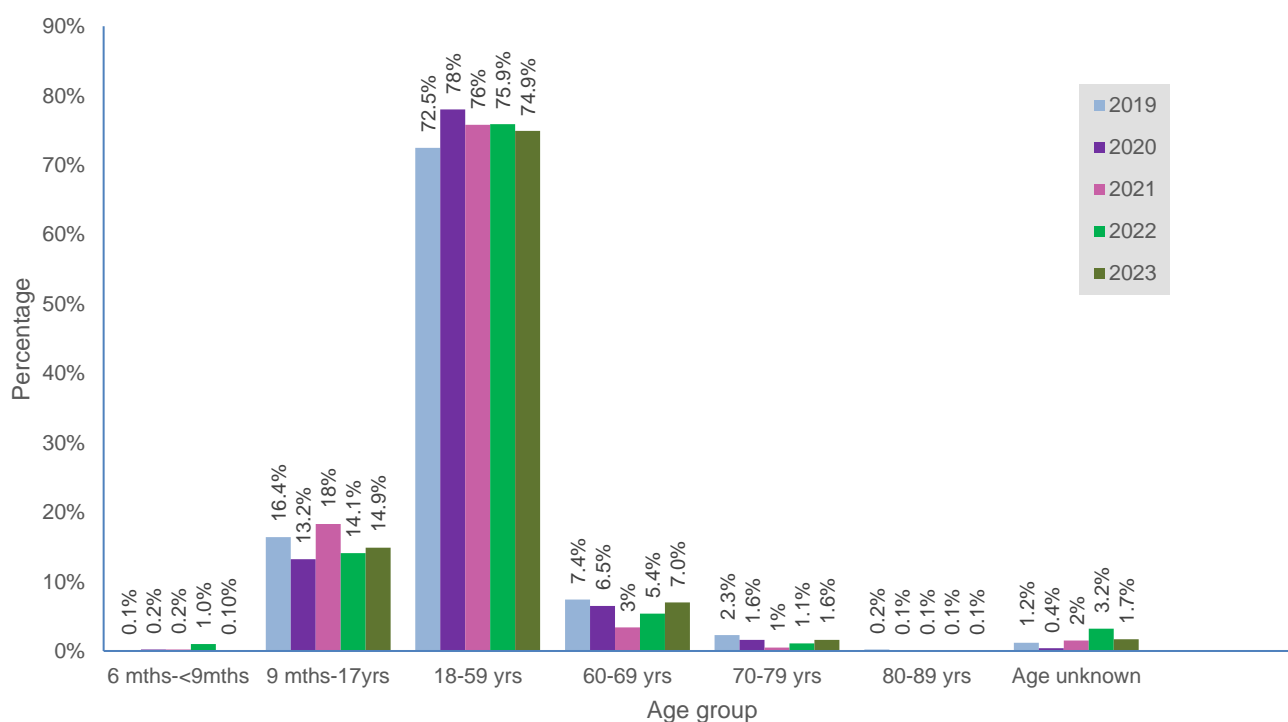
Figure 5: Number of YF vaccines administered according to type of YFVC



iii. Vaccine recipients

74.9% of vaccines administered in responding YFVCs were given to those aged between 18 and 59 years of age. 8.7% of YF vaccine was administered to those aged 60 years and over. This represents a 31.8% proportional increase compared with 2022 when 6.6% of YF vaccine was given to those aged 60 years and over (Figure 6).

Figure 6: Yellow fever vaccinations administered by age group 2019-2023



Individuals aged 60 years and older are at increased risk of YF vaccine associated adverse events. YFVCs were asked about confidence when offering YF risk assessment and advice to this age group. 1,425 YFVCs answered this optional question and of these, 26 YFVCs reported that advice for travellers aged 60 years or over was not offered by the YFVC. Of the remaining 1,399 YFVCs, 83.1% reported that all health professionals at the YFVC were comfortable when advising this group of travellers (Table 3).

Table 3: Health professional confidence in advising travellers aged 60 years and over

Confidence in offering YF risk assessment and advice to those aged 60 years and over	Number of YFVC (% of total)
All health professionals at YFVC	1162 (83.1%)
Some health professionals at YFVC	223 (15.9%)
No health professional at YFVC	14 (1%)
Total	1,399 (100%)

761 reinforcing doses of YF vaccine were given by responding YFVCs during 2023: representing less than 1% of all doses. The most common reason for administration of a reinforcing dose was for certification purposes where the original certificate or details of vaccination were unavailable (81.2%), followed by first YF vaccine dose given when aged less than two years (5.9%).

14 YFVCs reported administering YF vaccine where a contraindication to vaccination was present. All were followed up by NaTHNaC; and 13 were found to be survey completion errors. The one remaining YFVC vaccinated according to agreed protocols.

8,211 YF vaccines (9% of all YF vaccines given in 2023) were administered to travellers with a precaution to YF vaccine²; and of these, 96.5% were given to those aged 60 years and over (Table 4).

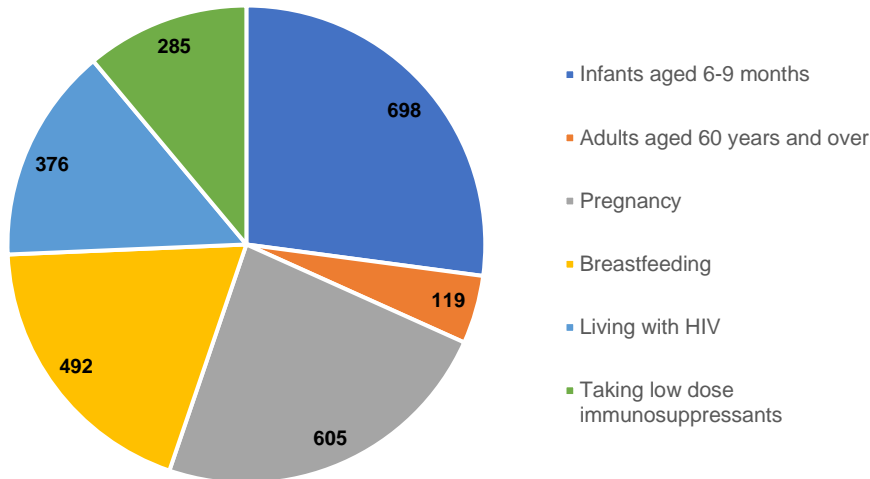
Table 4: Number of YF vaccines administered to travellers with a precaution to YF vaccine

Precaution	Number of YF vaccines
Infants aged 6-9 months	64
Adults aged 60 years and over	7,921
Pregnancy	25
Breastfeeding	58
Living with HIV	82
Taking low dose immunosuppressants	61
Total	8,211

² UK Health Security Agency (2024). Precautions for YF vaccine. In chapter 35 of the 'Green Book': Immunisation against infectious disease. gov.uk/government/publications/yellow-fever-the-green-book-chapter-35

YFVCs were asked further questions about travellers with a precaution to YF vaccine². Of responding YFVCs, 587 did not exclude travellers with a precaution, 867 excluded some groups with a precaution and 199 would not offer vaccine to travellers with a precaution to YF vaccine. The 867 YFVCs that excluded some travellers were asked which groups would not be offered YF vaccine at their YFVC. Responses can be found in Figure 7.

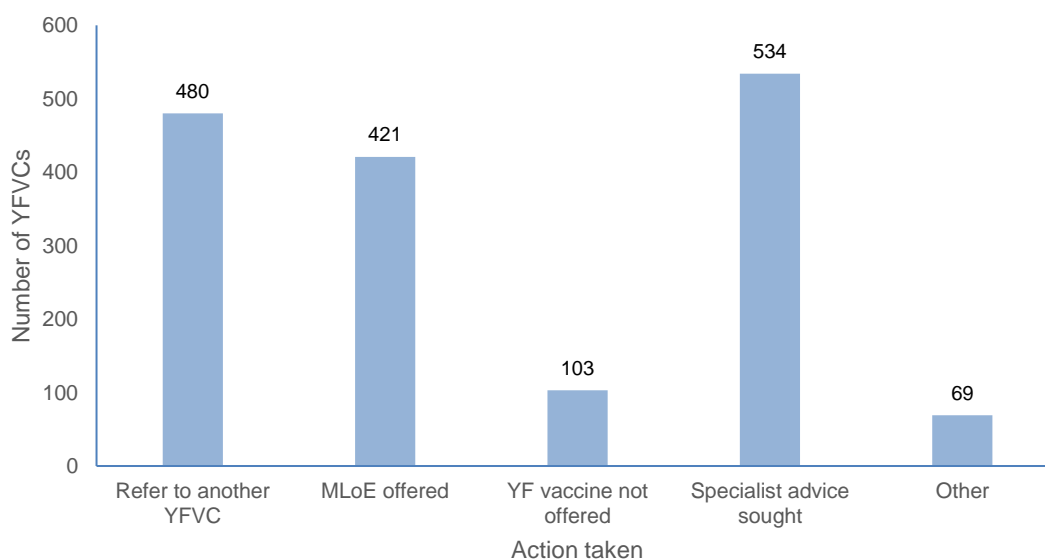
Figure 7: Number of YFVCs excluding each group of travellers with a precaution to YF vaccine



The most common reasons for excluding travellers from receiving YF vaccine included: PGD restrictions (46.5%); a clinical decision made by the YFVC that certain groups should not be vaccinated (19.3%); and lack of confidence to vaccinate travellers with a precaution to YF vaccine (13.3%).

Although YFVCs may exclude some groups, YF vaccine may still be appropriate. Therefore, YFVCs excluding some/all groups were asked what action(s) would be taken if YF vaccine was not offered to a traveller with a precaution to vaccination. Responses to this question may be seen in Figure 8.

Figure 8: YFVC response if unable to offer YF vaccine due to a precaution



² UK Health Security Agency (2024). Precautions for YF vaccine. In chapter 35 of the 'Green Book': Immunisation against infectious disease. gov.uk/government/publications/yellow-fever-the-green-book-chapter-35

There was one report of suspected Yellow Fever Vaccine-Associated Neurologic Disease (YEL-AND) and no cases of suspected Yellow Fever Vaccine-Associated Viscerotropic Disease (YEL-AVD) or anaphylaxis reported by responding YFVCs during 2023.

The one suspected case of YEL-AND had previously been reported to and followed up by NaTHNaC. It was not confirmed YEL-AND; the case fully recovered.

577 (35%) YFVCs issued MLoEs; and during 2023, 3,418 MLoE were issued to individuals who were travellers (Table 5).

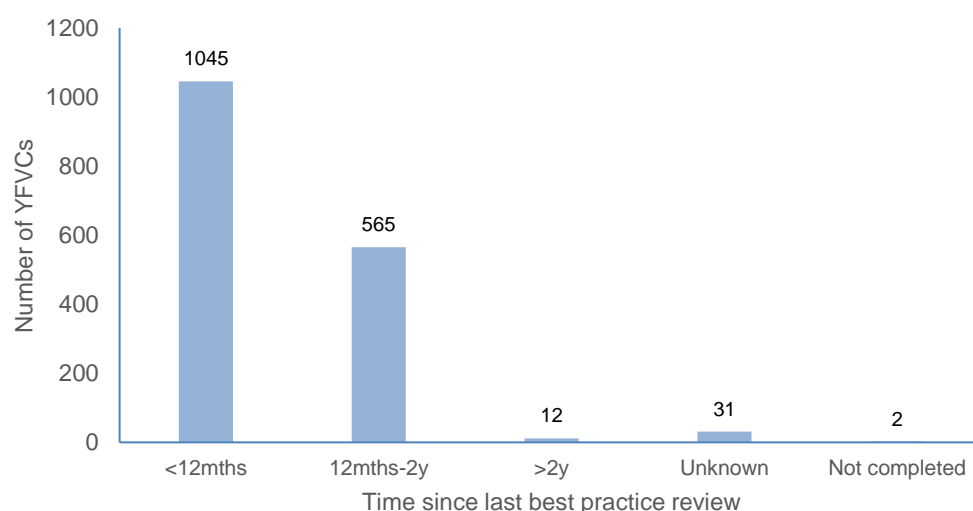
Table 5: MLoE issued and reason for issue

Reason for MLoE	Total	Percentage
Contraindication		
All	1770	51.8%
Precaution		
Aged 6-9 months	14	0.4%
Aged over 60yrs	1225	35.8%
Pregnancy	23	0.7%
Breastfeeding	9	0.3%
HIV	13	0.4%
Low dose immunosuppressants	75	2.2%
Other	289	8.4%
Total	3418	100%

iv. Conditions of Designation and Code of Practice

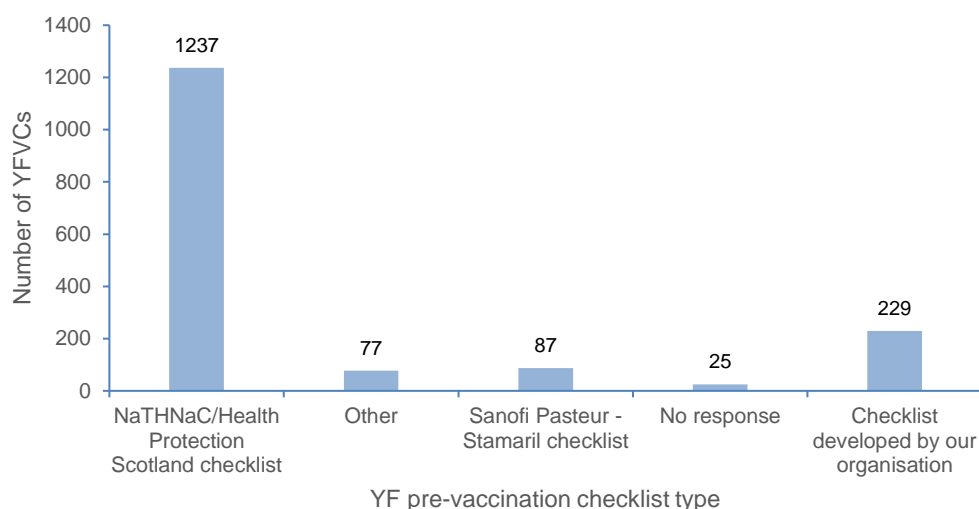
A best practice review had been completed by a total of 1,620 (98%) responding YFVCs: 1043 within the last year, 565 within the last 12-24 months and 12 more than 2 years ago. 2 (0.3%) YFVCs had not completed a best practice review and 31 (2.9%) YFVCs were unsure (Figure 9).

Figure 9: Time elapsed since last YFVC best practice review



A checklist was used by 1,628 (98.5%) responding YFVCs to support YF vaccine risk assessment; and of these, 1,236 (75.9%) used the NaTHNaC/PHS YF pre-vaccination checklist, 76 (4.7%) an alternative checklist, 87 (5.3%) the Stamaril checklist supplied by Sanofi Pasteur and 228 (14%) a checklist developed by their own organisation. 26 YFVCs were either unsure or did not use a YF pre-vaccination checklist (Figure 10).

Figure 10: YF risk assessment tool used by YFVC.



1,565 (94.7%) YFVCs supplied the YF vaccine PIL routinely to travellers receiving a YF vaccine; 88 YFVCs either did not provide or were unsure if the YF vaccine PIL was provided to travellers.

Conclusion

The 2023 AR reports on activity within YFVCs from 1 January 2023 to 31 December 2023.

For the second consecutive year, pharmacy YFVCs were the largest provider of YF services.

The number of YF vaccines reported to be administered during 2023 has increased from 2022; however, remains lower than the number of YF vaccines administered in 2019 (the last full year before the COVID-19 pandemic). Over half of YF vaccines administered in EWNl during 2023 were in pharmacy YFVCs.

The type of vaccine recipient remains, overall, representative of data collected in previous years.

Data collected about travellers with a precaution to YF vaccine will help inform and develop YF training offered to health professionals.

Additional optional questions related to dengue, which did not form part of the AR report, were included. This data will be analysed and reported separately.

The AR data provides an overview of YF activities in YFVCs in EWNl and enables follow up of areas of concern.

We would like to thank YFVCs who participated in the 2023 AR.

Appendix A: Questionnaire sent to all YFVCs that remained designated during 2023

Yellow Fever Vaccination Centres – Annual Return 2023

Your YFVC

All Yellow Fever Vaccination Centres (YFVCs) in England, Wales and Northern Ireland (EWNI) are required, as a [Condition of Designation](#), to submit an Annual Return of yellow fever vaccine use and associated adverse events to NaTHNaC. This detail will help inform what is known about yellow fever vaccination practice in EWNI.

YFVCs that do not comply with the requirement to submit an Annual Return by the closing date, may be temporarily de-designated until their return is received.

You will not receive a copy of your submitted Annual Return. If you wish to keep your own record, please print, or take screenshots of each page.

1. What is your YFVC ID Number? This is the 4-digit number after 'UKYFVC' on the YFVC's rubber stamp
2. What is the full postcode of the YFVC?
3. Please indicate your profession.
 - Doctor
 - Nurse
 - Pharmacist
 - Other (please specify)
4. Which of the following best describes your YFVC?
 - General Practice
 - Pharmacy
 - Occupational Health Department
 - Travel Clinic
 - Hospital
 - British Armed Forces
 - Other (please specify)

5. When was your YFVC designated?

- We have been designated for less than one year (this is the Annual Return for only part of 2023)
- We have been designated for over one year (this is the Annual Return for 2023)

YFVC Activity

6. How many health professionals administered yellow fever (YF) vaccine at your YFVC in 2023?

7. Of those health professionals who gave YF vaccine in 2023, how many had undertaken NaTHNaC YF vaccination training (e-learning +/- virtual classroom) during the last 2 years?

- All
- Some
- None

8. How many doses of YF vaccine were administered at your YFVC in 2023?

9. How many doses were administered in each of the following age groups?

If no doses were administered enter 0

- 6 months to under 9 months
- 9 months to 17 years
- 18 to 59 years
- 60 to 69 years
- 70 to 79 years
- 80 years and older
- Age unknown

10. How comfortable do health professionals at your YFVC feel about offering YF risk assessment and advice for those aged 60 years and older?

- All health professionals at this YFVC feel comfortable
- Some health professionals feel comfortable
- No health professional feels comfortable
- We do not advise travellers aged 60 years and older

11. How many reinforcing doses (to ensure continued protection according to the [Green book flowchart](#)), were administered during 2023?

- 0
- 1 or more (please enter the number of reinforcing doses administered)

12. How many reinforcing doses were given for the following reasons?

- Where the first dose given was:
 - when aged less than two years old
 - during pregnancy
 - whilst infected with HIV
 - when immune suppressed
 - before undergoing a bone marrow transplant
- Where previously vaccinated but ICVP (certificate) lost and reissue not possible
- Other

13. If Other, please specify

Contraindications

14. Was YF vaccine given when there was a contraindication to vaccination? See the [Green Book](#) for a list of contraindications to YF vaccine.

- Yes
- No

15. Which of the following groups, where YF vaccine is contraindicated, were given YF vaccine in 2023? Please tick all that apply.

**Do not include travellers aged 60 years or over travelling to areas where YF vaccine is recommended and vaccination is a precaution.*

- Aged under six months
- History of a confirmed anaphylactic reaction to a previous dose of YF vaccine
- History of a confirmed anaphylactic reaction to any component of the vaccine, including egg
- History of thymus disorder
- History of a primary or acquired immunodeficiency due to a congenital condition or disease process, (see chapters 6 & 35 of the [Green Book](#))
- Immunosuppressed due to treatment, (see chapters 6 & 35 of the [Green Book](#))
- *Aged 60 years or over and travelling to an area where YF vaccination **not generally recommended by WHO.**
- Family history (1st degree relative) of [YEL-AVD](#) and [YEL-AND](#) following vaccination

Precautions

16. Where there is a [precaution](#) to YF vaccine, are there any groups that you would routinely exclude?

- We do not exclude any group with a precaution
- We exclude some with a precaution
- We exclude all groups with a precaution

17. How many YF vaccines were given to the following groups of travellers with a precaution to YF vaccine during 2023? If no doses were administered enter 0.

- Infants aged 6-9 months
- Aged 60 years and over
- Pregnancy
- Breastfeeding mother
- HIV infection with CD4 >200 and suppressed viral load
- Taking lower dose immunosuppressive therapies (see chapter 6 and 35 of the [Green Book](#))

18. Which of the following groups would not be offered YF vaccine at your YFVC? Please tick all that apply

- Infants aged 6-9 months
- Aged 60 years and over
- Pregnancy
- Breastfeeding mothers
- HIV infection with CD4 >200 and suppressed viral load
- Taking lower dose immunosuppressive therapies (see chapter 6 and 35 of the [Green book](#))

19. What is the main reason for not offering YF vaccine to some groups with a precaution to YF vaccine?

- Our Patient Group Direction (PGD) excludes these groups
- We are not confident to vaccinate these groups
- Clinically we have decided that this group should not be vaccinated
- Our management has decided that the risk of vaccinating this group is too great
- Other (please specify)

20 If your policy is to exclude some travellers with a precaution to YF vaccine, what advice do you give them?

- That we will refer them to another YFVC
- That we will not vaccinate them
- That we can provide them with a Medical Letter of Exemption (if a certificate [ICVP] for YF is required)
- That we will seek specialist advice
- Other (please specify)

Medical Letters of Exemption

20. How many Medical Letter(s) of Exemption (MLOE) were issued by your YFVC in 2023?

- 0
- Unknown
- 1 or more (please enter the number of MLoE issued)

21. How many Medical Letter(s) of Exemption (MLOE) were issued where there was a contraindication to yellow fever vaccine administration? Where none were issued enter 0

22. How many Medical Letters of Exemption (MLOE) were issued where there was a precaution to yellow fever vaccine administration? Where none were issued enter 0

- Infants aged 6-9 months
- Aged 60 years and over [vaccine risk considered to outweigh the risk of disease]
- Pregnancy
- Breast feeding mother
- HIV infection with CD4 >200 and suppressed viral load
- Taking lower dose immunosuppressive therapies (see chapter 6 and 35 of the [Green Book](#))
- Other

23. If you have given a Medical Letter of Exemption (MLOE) for 'other', please give further details below

Yellow Fever Vaccine Associated Severe Adverse Events (YEL-SAE)

24. How many of the following serious Yellow Fever Vaccine Associated Severe Adverse Events ([YEL-SAE](#)) occurred at your YFVC in 2023? If none, please enter 0
NaTHNaC may contact a YFVC for clarification on data submitted in some circumstances.

- Anaphylaxis
- Yellow fever vaccine associated neurological/neurotropic disease [YEL-AND]
- Yellow fever vaccine associated viscerotropic disease [YEL-AVD]

25. If any serious YEL-SAE occurred at your centre, who were they reported to?

- NaTHNaC
- MHRA via the yellow card system
- The manufacturer
- Other (please specify)

Conditions of Designation and Code of Practice

The following section asks about the governance of your YFVC and should be answered by a health professional who is responsible for risk assessment and administration of YF vaccine. All health professionals administering YF vaccine should be aware of the [Commission on Human Medicines 2019 report](#).

26. How often is YF practice reviewed at your YFVC?

- 0 to 12 months
- 12 months to 2 years
- More than 2 years
- Never
- Unsure

It is recommended that for good governance YFVCs undertake an [annual best practice review](#)

27. Is a standardised YF pre-vaccination checklist used during the travel health consultation to assist yellow fever vaccination risk assessment?

- Yes
- No
- Unsure

28. If yes, which standardised YF pre-vaccination checklist is used?

- [NaTHNaC/Health Protection Scotland YF pre-vaccination checklist](#)
- [Sanofi Pasteur – Stamaril checklist](#)
- Checklist developed by our organisation
- Other (please specify)

29. Is the YF vaccine [Stamaril] Patient Information Leaflet [PIL] routinely given to the traveller?

- Yes
- No
- Unsure