Uptake of flu, COVID-19 and pneumococcal vaccines in a cohort of people living with HIV

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Background:

People living with HIV are at greater risk of complications associated with influenza, SARS-CoV-2 and pneumococcus than the general population.[1-3]

Current BHIVA guidelines recommend vaccinating all patients against these infections. [4,5]

The available vaccines for these infections include an annual flu vaccine, three initial COVID-19 vaccines followed by booster doses every 6 months after last vaccine dose, and a single dose of Prevenar-13.

Within NHS Tayside flu and COVID-19 vaccines are provided by community-based vaccination teams to both the general population and high risk groups whereas Prevenar-13 is delivered to people living with HIV within specialist HIV out-patient clinics.

The purpose of this audit was to determine factors associated with the uptake of these vaccines in order to inform local vaccine delivery models for people living with HIV.

Method:

All patients who were registered as receiving care within NHS Tayside at the end of November 2022 were included.

Demographic, clinical and Prevenar vaccine data were obtained from the Turas Vaccine Management Tool (VMT) which is the only recording system used by the vaccine management team.

Data collected included:

- Age
- Gender
- Local authority (urban, mixed, rural, other)
- Scottish Index of Multiple Deprivation quintile
- Years in HIV care
- ART status
- CD4 cell count (cells/mm3)
- Most recent viral load (detectable, undetectable)
- On "out of care list" in last 12 months
- Known to harm reduction team
- Known respiratory or cardiovascular co-morbidities

Results:

The cohort consisted of 364 patients known to the service of which one was excluded as clinical information was not available. Sixty nine percent were male, the mean age was 51.3 years old and 97% were undetectable on ART (table 1).

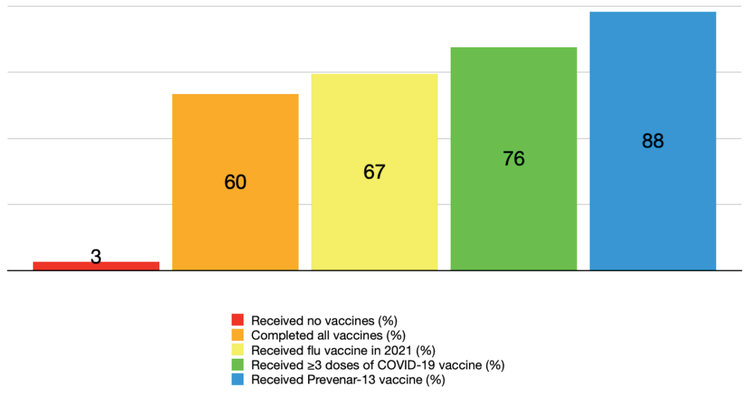
Table 1: Cohort demographics and vaccine uptake

	n (%)	Flu vaccine received in 2021 (%)	≥1 dose COVID-19 vaccine received (%)	≥3 doses COVID-19 vaccine received (%)	Prevenar-13 vaccine received (%)
Total	363 (100)	245 (67)	321 (88)	277 (76)	321 (88)
Gender					
Male	242 (69)	168 (69)	218 (90)	193 (80)	214 (88)
Female	120 (31)	77 (64)	103 (86)	84 (70)	107 (89)
Other	0 (0)	N/A	N/A	N/A	N/A
Age					
<50 years old	150 (41)	77 (51)	126 (84)	93 (62)	125 (83)
≥50 years old	213 (59)	168 (79)	195 (92)	184 (86)	196 (92)
Local authority					
A (urban)	187 (52)	121 (65)	163 (87)	133 (71)	167 (89)
B (mixed)	93 (26)	59 (63)	84 (90)	73 (78)	76 (82)
C (rural)	52 (14)	40 (77)	46 (88)	44 (85)	50 (96)
Other	30 (8)	25 (83)	28 (93)	27 (90)	28 (93)
Deprivation quintile					
1	103 (28)	53 (51)	84 (82)	66 (64)	90 (87)
2	89 (25)	58 (65)	80 (90)	67 (75)	80 (90)
3	58 (16)	45 (78)	55 (95)	48 (83)	54 (93)
4	72 20)	61 (85)	66 (92)	63 (88)	62 (86)
5	39 (11)	28 (72)	35 (90)	33 (85)	34 (87)
Not known	1 (<1)	0 (0)	1 (100)	0 (0)	1 (100)
Years in HIV care					
<5	23 (6)	13 (57)	19 (83)	16 (70)	22 (96)
5-9	58 (16)	33 (57)	52 (90)	41 (71)	48 (83)
10-14	98 (27)	66 (67)	89 (91)	75 (77)	90 (92)
15-19	59 (16)	44 (75)	53 (90)	49 (83)	52 (88)
>20	104 (29)	80 (77)	96 (92)	86 (83)	96 (92)
Not documented	15 (4)	9 (60)	12 (80)	10 67)	13 (87)
ART status					
On ART	355 (98)	244 (69)	316 (89)	275 (77)	316 (89)
Not on ART	8 (2)	1 (13)	5 (63)	2 (25)	5 (63)
CD4 count (cells/mm^3)					
≥500	273 (75)	190 (70)	246 (90)	213 (78)	242 (89)
201-499	80 (22)	51 (64)	69 (86)	59 (74)	71 (89)
≤200	10 (3)	4 (40)	6 (60)	5 (50)	8 (80)
Most recent viral load					
Detectable	12 (3)	4 (33)	8 (67)	5 (42)	11 (92)
Undetectable	351 (97)	241 (69)	313 (89)	272 (77)	310 (88)
On "out of care" list in last 12 months	22 (6)	5 (23)	13 (59)	5 (23)	18 (82)
Known to Harm Reduction team	12 (3)	4 (33)	9 (75)	4 (33)	12 (100)
Known respiratory or cardiovascular co-morbidities	109 (30)	82 (75)	101 (93)	89 (82)	99 (91)

Overall Vaccine Uptake:

Vaccine uptake is illustrated in figure 1 showing lowest uptake of flu vaccine and highest uptake of Prevenar-13 within this cohort. Only 60% of patients completed all vaccines and 3% received no vaccines.

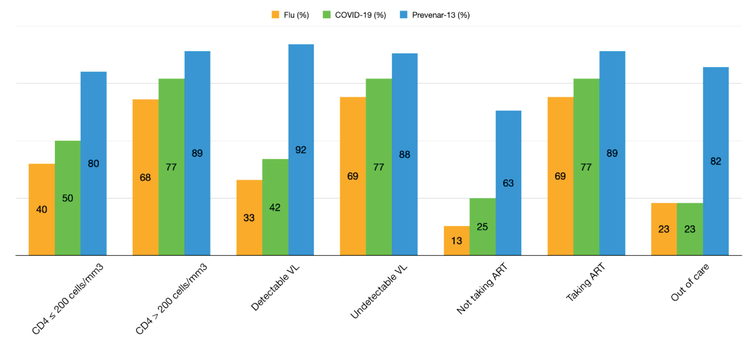
Figure 1: Overall uptake of vaccines



Factors associated with poor HIV outcomes

Figure 2 shows that patients with optimal HIV care had higher uptake of vaccines. Lower uptake of flu and COVID-19 vaccines was seen in patients who had been out of care for the past 12 months, had a detectable viral load and who weren't taking ART.

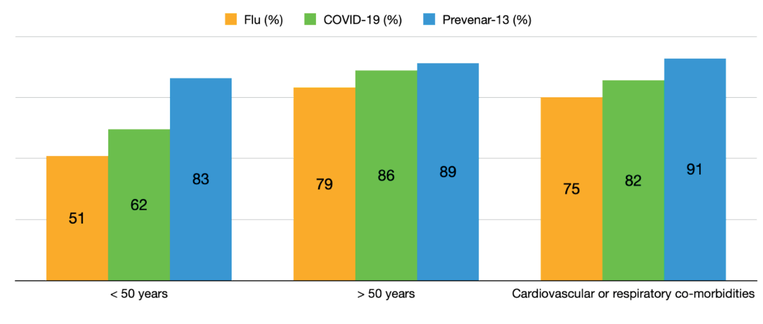
Figure 2: Uptake of vaccines by optimisation of care



Factors associated with poor respiratory infection outcomes

Thirty percent of the cohort had additional cardio or respiratory co-morbidities and the majority (59%) were aged over 50 years. Figure 3 shows good uptake in these groups.

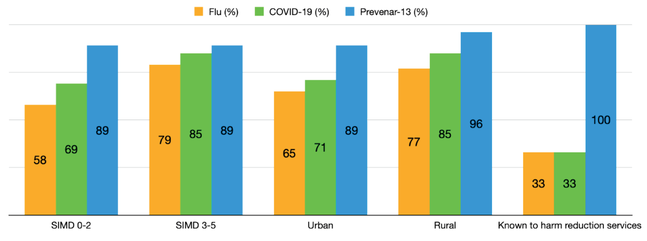
Figure 3: Uptake of vaccines by age and co-morbidities



Other health inequalities

Patients in the highest quintiles of social deprivations and those living in urban areas had lower uptake of flu and COVID-19 vaccines as seen in figure 4. There was low uptake of both flu and COVID-19 vaccines in the 12 patients who have their care delivered by the harm reduction service however all of them had received a Prevenar vaccine.

Figure 4: Uptake of vaccines by health inequality



Discussions and Conclusions:

This audit benefits from a very complete dataset including all but one patient in the cohort. Vaccine data is robust due to the use of the VMT which is the only place to record flu and COVID vaccine delivery. It would have been helpful to be able to collect flu vaccine uptake data prior to 2021 to compare the uptake before and during the COVID pandemic. Many analysed factors may be associated with others but a multi-variate analysis was outwith the scope of this project. Furthermore, some risk factors could not be included (i.e. ethnicity, mode of transmission) due to lack of available information.

There are few published data on vaccine uptake in other cohorts however one UK study saw a 70% uptake of flu vaccine (2015/2016) in a cohort of 212 people living with HIV. Of those, 25% were vaccinated within an HIV service.[6] Whilst our audit showed similar uptake (67%), this study may also suggest that vaccinating in-house is an effective way of improving uptake. A further study saw that globally, by December 2021, 74% of patients with HIV received at least 1 dose of COVID-19 vaccine and although our data compares favourably (88% uptake of 1 dose) it is difficult to compare across different healthcare and data collecting systems.[7] It would be helpful to share more of these cohort-level data within the UK to help services to benchmark, standard-set, audit and implement quality improvement interventions.

The higher uptake of vaccines in those of older age and known co-morbidities was reassuring however factors associated with increased HIV-related morbidity and mortality such as immunosuppression and viraemia were associated with poor uptake of flu and COVID vaccines. Interestingly the uptake of Prevenar in these groups was high suggesting that this model of delivery is more acceptable. This may be because it administered as a single dose, it is delivered in a setting and by a team the patients are familiar with, it can be given opportunistically and we provide pro-active call and recall. There may be additional barriers for these groups to access community-based vaccine hubs including the cost of travel for additional appointments, the appointment-booking systems and the required health and digital literacy to navigate these and the fear of HIV-related stigma and other intersecting inequalities.

As a result of this work we plan to invite the vaccine management team to deliver flu and COVID vaccines from within the specialist HIV clinics to make best use of the dedicated resource and to remove additional barriers to our highest-risk patients receiving important vaccines.

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