Yellow Card Centre Scotland

Annual Report
April 2022 to March 2023

Yellow Card Reports (Scotland)

29% increase
Excluding COVID-19 vaccine reports from both years

86% decrease
Including COVID-19 vaccine reports from both years

3172 total reports
(1345 of which are COVID-19 vaccine reports)

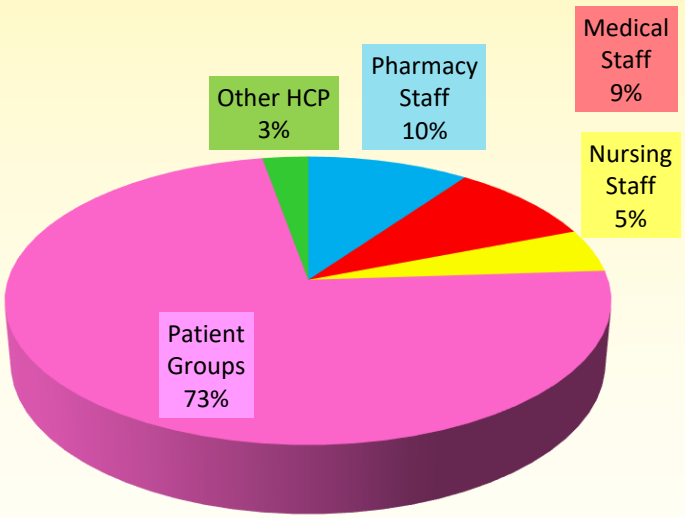
58 reports per 100,000 population
(including COVID-19 vaccine reports)

Reports submitted to the Yellow Card Scheme are for suspected adverse reactions that have not been proven to be related to the drug, and should not be interpreted as known side-effects

YCC Scotland Key Messages

From July 2022, the standard reporting data has been expanded to include reports for COVID-19 vaccines. This has led to a significantly increased number of reports for 2022/23 overall compared to the previous year, which did not include COVID-19 vaccine reports within the standard dataset.

Source of Reports



Top Reported Medicines

1. COVID-19 Vaccine
2. Influenza Vaccine
3. Nirmatrelvir/ Ritonavir
4. Pneumococcal Vaccine
5. Sertraline

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ANNUAL REPORT OF THE YELLOW CARD CENTRE SCOTLAND TO THE MEDICINES AND HEALTHCARE PRODUCTS REGULATORY AGENCY

2022–2023

1. Team

Professor Simon Maxwell	Consultant Clinical Pharmacologist/Medical Director YCC Scotland
Mr Scott Garden	NHS Lothian Director of Pharmacy and Medicines
Professor James Dear	Consultant Clinical Pharmacologist/Deputy Medical Director YCC Scotland
Ms Lesley Macher	Acting Lead Pharmacist Lothian Medicines Information Service/ YCC Scotland
Ms Louise Summers	Principal Pharmacist Lothian Medicines Information Service/YCC Scotland
Ms Louise Smith	Principal Pharmacist Lothian Medicines Information Service/YCC Scotland
Mr Alexander Kiker	Information Officer Lothian Medicines Information Service/ YCC Scotland

2. Executive Summary

Like many services and organisations, the Yellow Card Centre for Scotland has continued to respond to the lifestyle changes that have followed the pandemic. These include the reporting of adverse events involving vaccines and treatments for COVID-19 and the reliance on virtual meetings for the purposes of delivering teaching and meeting with board and advisory group members.

From April 2022 to March 2023, 3172 reports were submitted via the Yellow Card scheme from Scottish addresses.

The COVID-19 vaccine continued to be the highest reported item with 1345 reports being completed. This number is considerably lower than was seen in the same time period in 2021/22 when over 22,000 reports of suspected adverse drug reactions were received.

Excluding COVID-19 vaccine reports, a total of 1827 Yellow Card reports were submitted in Scotland in 2022/23, representing a 29% increase in reporting compared to the previous year. This figure now exceeds pre-pandemic reporting levels without considering COVID-19 vaccine reports. Prior to the pandemic, reporting averaged around 1440 reports annually from the 5 years prior to the pandemic (April 2015 to March 2020 inclusive).

This year the Medicines and Healthcare products Regulatory Agency (MHRA) have included COVID-19 vaccine reports as part of the business-as-usual reporting and will be included throughout this report. Any trends highlighted or comparisons in this report should be interpreted in this context.

Patient groups have continued to represent the greatest number of reporters, while many healthcare professional groups have contributed to the overall increase in reporting too. Specific mention is made to the 371% increase from last year by radiographers across ten different health board areas.

Reporting methods have remained relatively consistent, with the website remaining the preferred method and an increase in reporting via the app.

This report presents an opportunity to remind INPS Vision prescribing system users in general practices that YC reports can be automatically populated with information from the *Allergy and Intolerance* page and submitted directly. Reporting via this method was down 12% in 2022/23 compared with the previous year.

Direct e-YC reporting is also available via Pharmacy Medicines Information systems (*MiDatabank*). Reporting using this method had increased by 85% compared with the previous year.

As the MHRA continue to promote Yellow Card reporting for adverse incidents involving medical devices in England and Wales, YCC Scotland keep working with the Incident Reporting and Investigation Centre (IRIC) within NHS National Services Scotland. Local authorities and health boards throughout Scotland are directed to IRIC for such reporting while the public are asked to submit reports via the Yellow Card scheme.
https://www.gov.uk/report-problem-medicine-medical-device

In response to the increased dependence on digital solutions for promoting and teaching, YCC Scotland have been working closely with NHS Education for Scotland to review the current e-Learning modules on the TURAS platform and improve accessibility. The 6 e-Learning modules have been used in previous years as part of blended learning with positive feedback.

In the coming months members of the YCC Scotland team are eager to return to interactive sessions where possible to ensure all opportunities are taken to promote reporting by all groups, patients, carers, guardians, and professionals. The advisory group also recognised the importance of reviewing how the service will deliver teaching and promotion post-pandemic and has commissioned a communications strategy for review in October 2023.

Recent engagement with Healthcare Improvement Scotland and their Medicines Safety Strategy Clinical Leadership Fellow has also introduced an opportunity to be involved with their work in reducing medicines-related harm.

There have been significant changes to the YCC Scotland team this year with Tracy Duff (Lead Pharmacist Medicines Information / YCC Scotland) leaving officially in September 2022. Lesley Macher (Acting Lead Pharmacist) joined the team in January 2023 and Amy Halliwell (Senior Pharmacist) moved on from her temporary post late 2022. Louise Smith (Principal Pharmacist) has subsequently joined the team in July 2023.

Please discuss this report, and the importance of reporting suspected adverse drug reactions to the Yellow Card Scheme with your colleagues and peers. For information on how we can help to support any local initiatives to raise awareness in your area please contact yccscotland@nhslothian.scot.nhs.uk

The governance of the centre remains with the YCCS Management Board (Chair: Professor Maxwell) and the YCCS Advisory Group (Chair: Yvonne Semple). The former group meets four times each year to manage operational issues while the latter is a vehicle for Scottish stakeholders' oversight, support, and direction to our objectives. Details are available on our website http://www.yccscotland.scot.nhs.uk/.

3. Yellow Card Data

3a Total Scottish Reports

A total of **3172 reports** of suspected adverse drug reactions were submitted from Scotland in 2022/23 via standard Yellow Card reporting, representing an overall 124% increase compared to the previous year (2021/22). This increase can be partly attributed to reports for COVID-19 vaccines (n=1345) which are included in the standard dataset as of July 2022, whereas in previous years they were listed separately. Excluding the reports for COVID-19 vaccines leaves a total of 1827 reports, which still represents an increase of 29% from the previous year's standard reporting data.

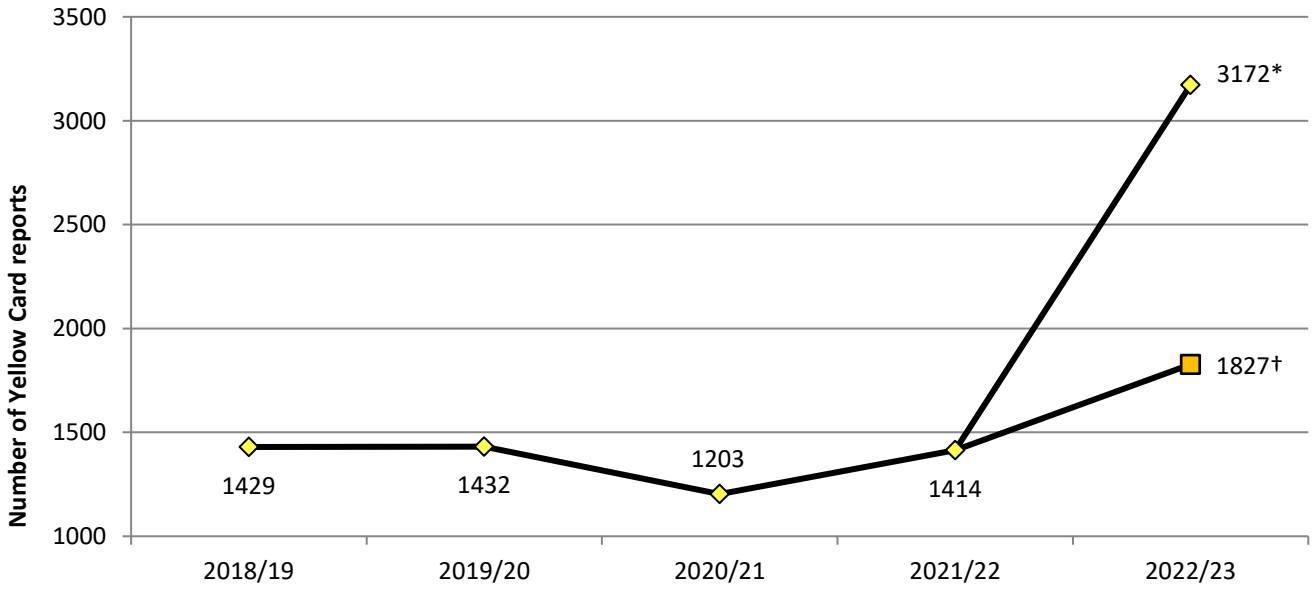
Within the remainder of this report, the data for 2022/23 will largely include reports for COVID-19 vaccines, but will be compared to data for 2021/22 which excluded COVID-19 vaccines. This is because of a change in the way adverse reactions to COVID-19 vaccines are reported, as this is now done via the standard Yellow Card reporting pathway rather than via a dedicated COVID-19 platform.

Table 1 and **Figure 1a** below illustrate the trend in standard reporting in Scotland over the last 5 years. **Figure 1b** shows the trend in reporting for all products, including reports for COVID-19 vaccines, over the last 3 years.

Table 1 – Number of Yellow Card Reports from Scotland over the past 5 years

Year	Number of reports	Percentage change on previous year
2018/19	1429	0%
2019/20	1432	0%
2020/21	1203	−16%
2021/22	1414	+18%
2022/23	**3172**	**+124%**

Figure 1a - Number of Yellow Card Reports from Scotland over the past 5 years



*all *standard data, including COVID-19 vaccine reports from July 2022 onwards*

†*excluding 2022/23 COVID-19 vaccine reports*

Figure 1b - Number of Yellow Card Reports from Scotland over the past 3 years (including COVID-19 vaccine reports)

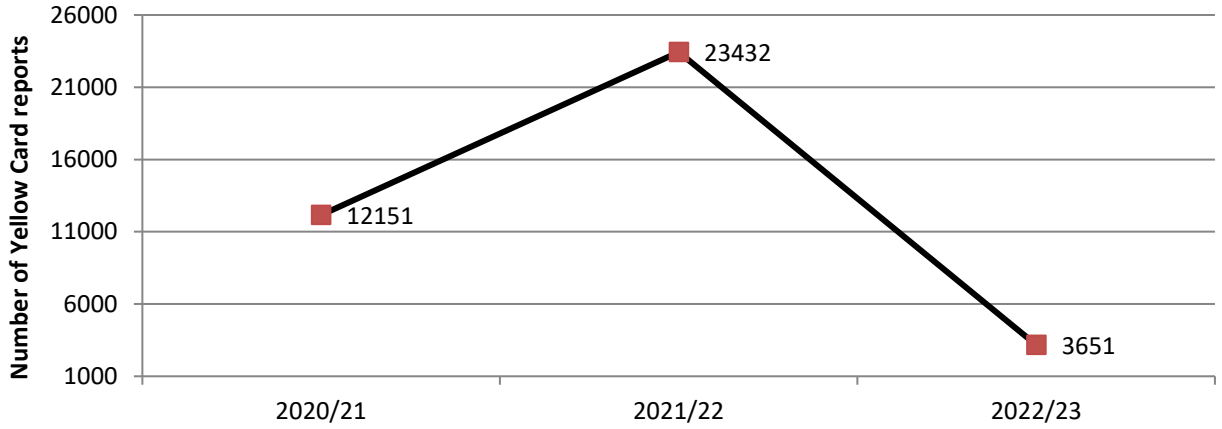
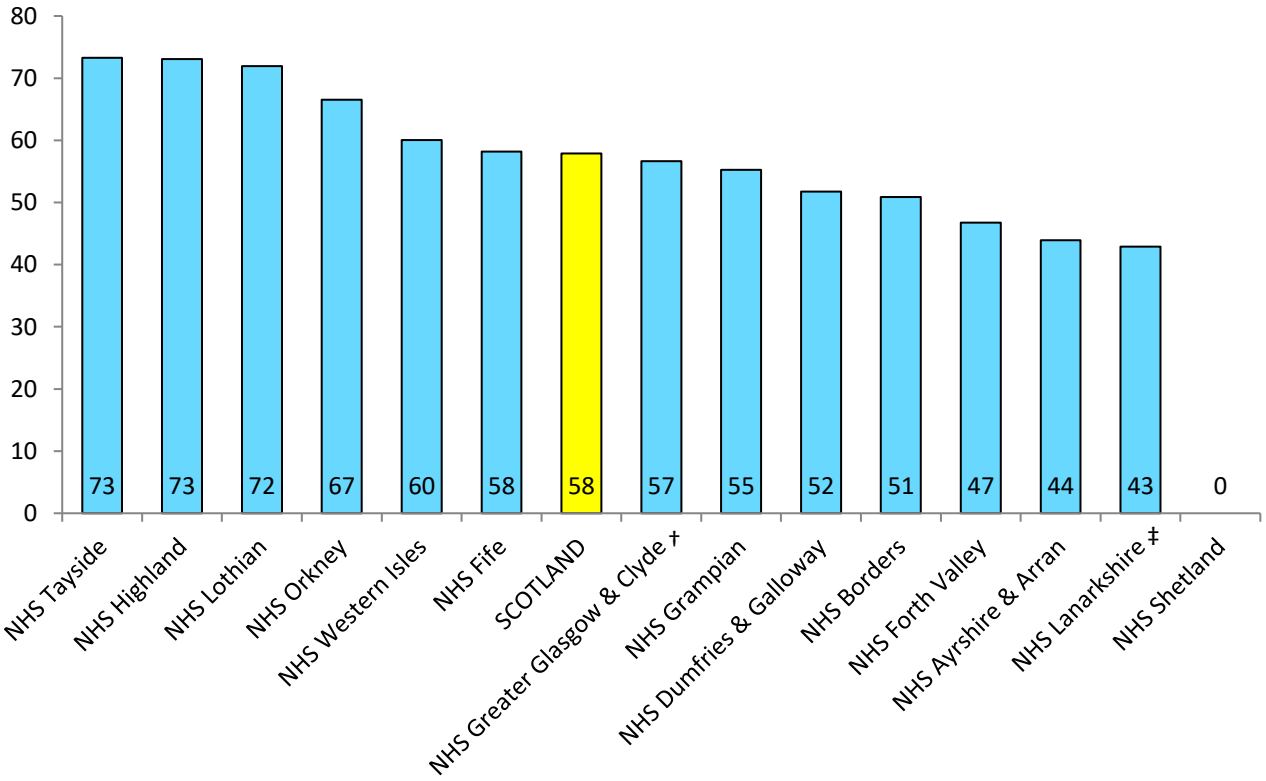


Figure 2 - Health Board Yellow Card Reporting per 100,000 population* (Scotland 2022/23)



*Statistics from National Registers of Scotland, Population estimates mid-2022 as mid 2023 data was unavailable
†Reports for Golden Jubilee Hospital are included in NHS Greater Glasgow and Clyde
‡Reports for the State Hospital are included in NHS Lanarkshire

Figure 2 shows how health boards in Scotland compare to the Scottish average (reports per 100,000 population). The average number of Yellow Card reports in 2022/23 was 58 reports per 100,000 population in Scotland, compared to the previous year of 26 reports per 100,000 population.

The top 3 reporting health boards per 100,000 population in 2022/23 were NHS Tayside, NHS Highland, and NHS Lothian. Caution is necessary when interpreting these results due

to the very low number of reports received from some of the NHS Scotland Health Boards, in particular for NHS Shetland.

Figure 3 – Number of Yellow Card Reports submitted over the last 5 years (top 5 reporting health boards in 2022/23)

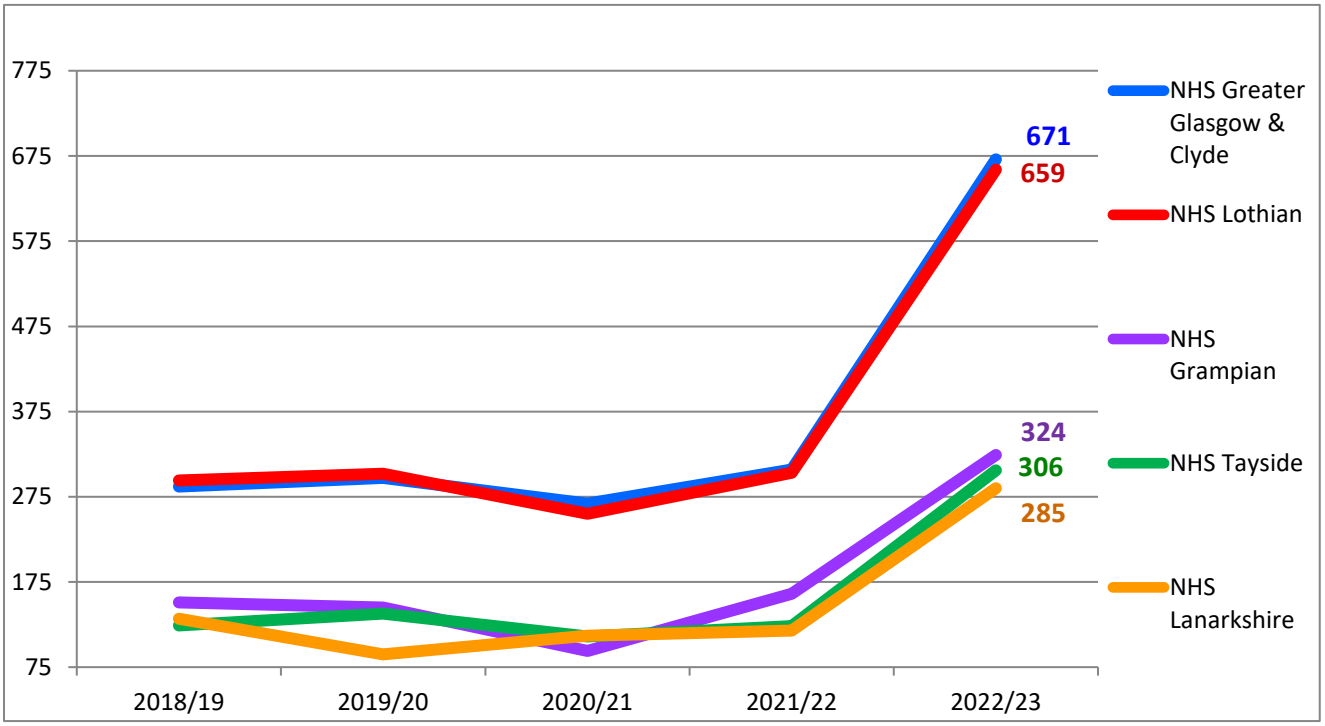


Figure 3 shows the 5-year trend in reporting for the five health boards that submitted the highest number of reports (total) in 2022/23.

Reporting has improved across all health board areas in 2022/23 compared to the previous year, with NHS Fife showing the largest proportional change with an increase of +176% (from 2021/22 - 79 reports to 2022/23 – 218 reports).

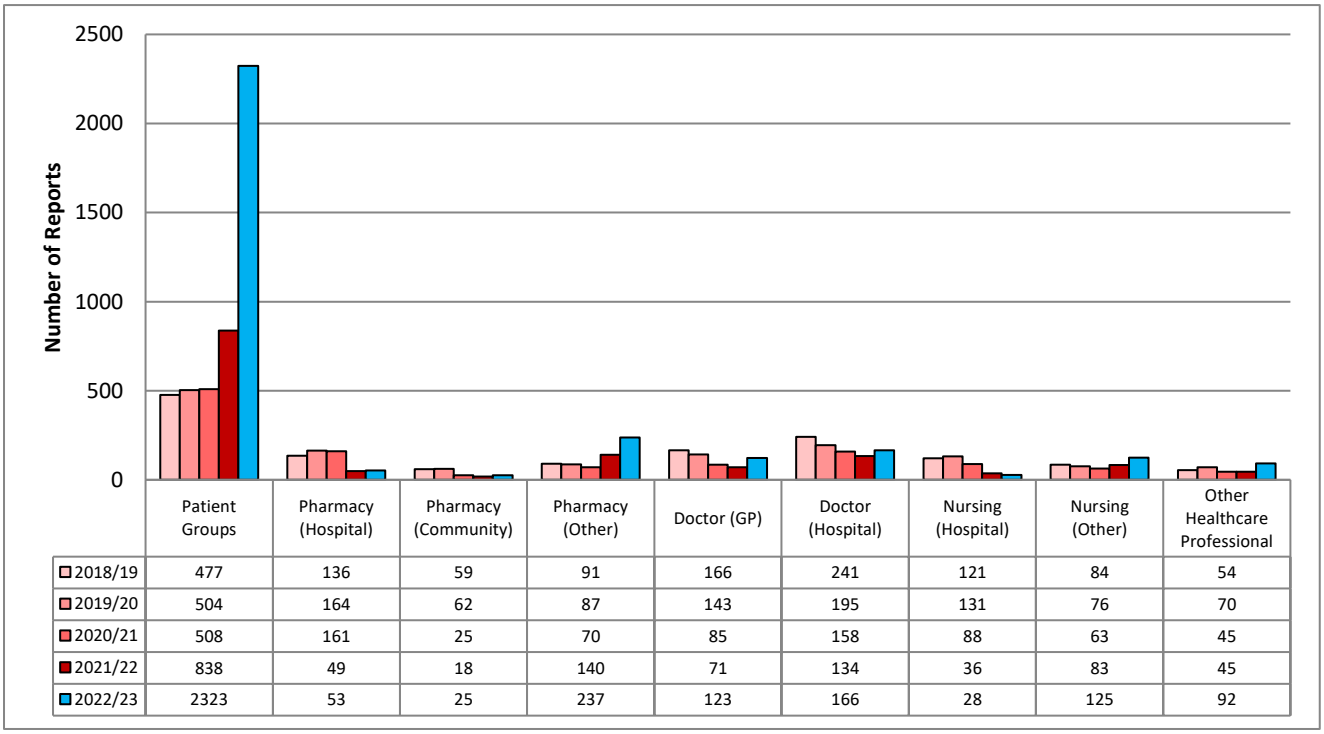
Substantial increases are evident across the whole of Scotland, and even the smallest change compared to the previous year (for NHS Borders) still represents an increase of +69% (from 2021/22 - 35 reports to 2022/23 – 59 reports).

For the NHS Western Isles, NHS Shetland and NHS Orkney, the number of reports is overall too low to allow trend analysis.

Further details can be provided to health boards on request.

3b Reporter Groups

Figure 4 - Scotland total Yellow Card reports by reporter groups over the last 5 years



	Patient Groups	Pharmacy (Hospital)	Pharmacy (Community)	Pharmacy (Other)	Doctor (GP)	Doctor (Hospital)	Nursing (Hospital)	Nursing (Other)	Other Healthcare Professional
2018/19	477	136	59	91	166	241	121	84	54
2019/20	504	164	62	87	143	195	131	76	70
2020/21	508	161	25	70	85	158	88	63	45
2021/22	838	49	18	140	71	134	36	83	45
2022/23	2323	53	25	237	123	166	28	125	92

Patient Groups: Patients; Parents; Parents; Consumers
Pharmacy Other: Not specified; Pharmacy Assistant/Technician; Trainee Pharmacist
Nursing Other: Not specified; Community; Midwife
Other Healthcare Professional: Chiropodist; Optometrist; Healthcare Assistant; Radiographer; Paramedic; Dentist; Medical Student; Not specified; Not specified (hospital); Unknown

Figure 4 shows the contribution of specific reporter groups to the total reports submitted in Scotland over the last five years. These are grouped by profession, and subdivided into sector where the data allows.

Healthcare Professionals (HCPs) accounted for only 27% of the total reports in Scotland in 2022/23. Despite a +47% increase in the total number of reports submitted (from 577 in 2021/22 to 849 in 2022/23) the proportion of reports from HCPs is notably much lower than in 2021/22, when it was 41% of all reports. Almost all groups noticed an increase in reporting and specific mention is made to the 371% increase from last year by radiographers across ten different health board areas (captured under 'other healthcare professionals' for the purposes of this report).

Patient groups, including reports from patients, parents, and carers, accounted for 73% of the total reports in Scotland, representing yet another considerable increase in the total number of reports, from 843 in 2021/22 to 2323 in 2022/23 (177% increase).

A further breakdown of the "Other Healthcare Professional" reports is illustrated in **Figure 5**. These figures include the professions which do not sit directly under the other primary categories of Medical, Nursing, Pharmacy, or Patient reports. Examples include dentists, radiographers, and optometrists, and collectively these constitute 3% of all Scottish reports in 2022/23.

Figure 5 – Percentage of Total Reports in Scotland for each Reporter Group

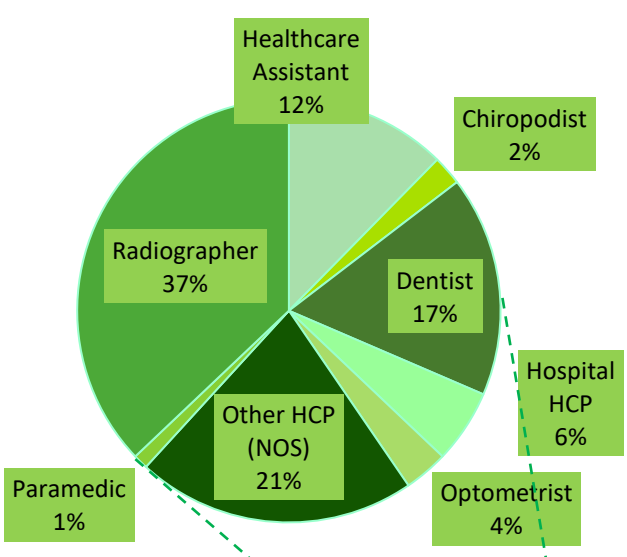


Figure 5c – Percentage of reports for reporter types categorised as 'other healthcare professionals'

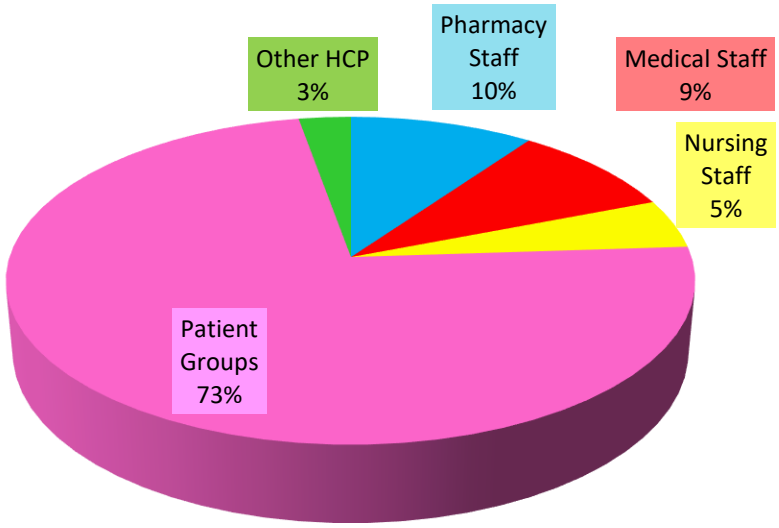


Figure 5a – Percentage of reports for the five primary reporter groups: patient; nursing; medical; pharmacy; and other

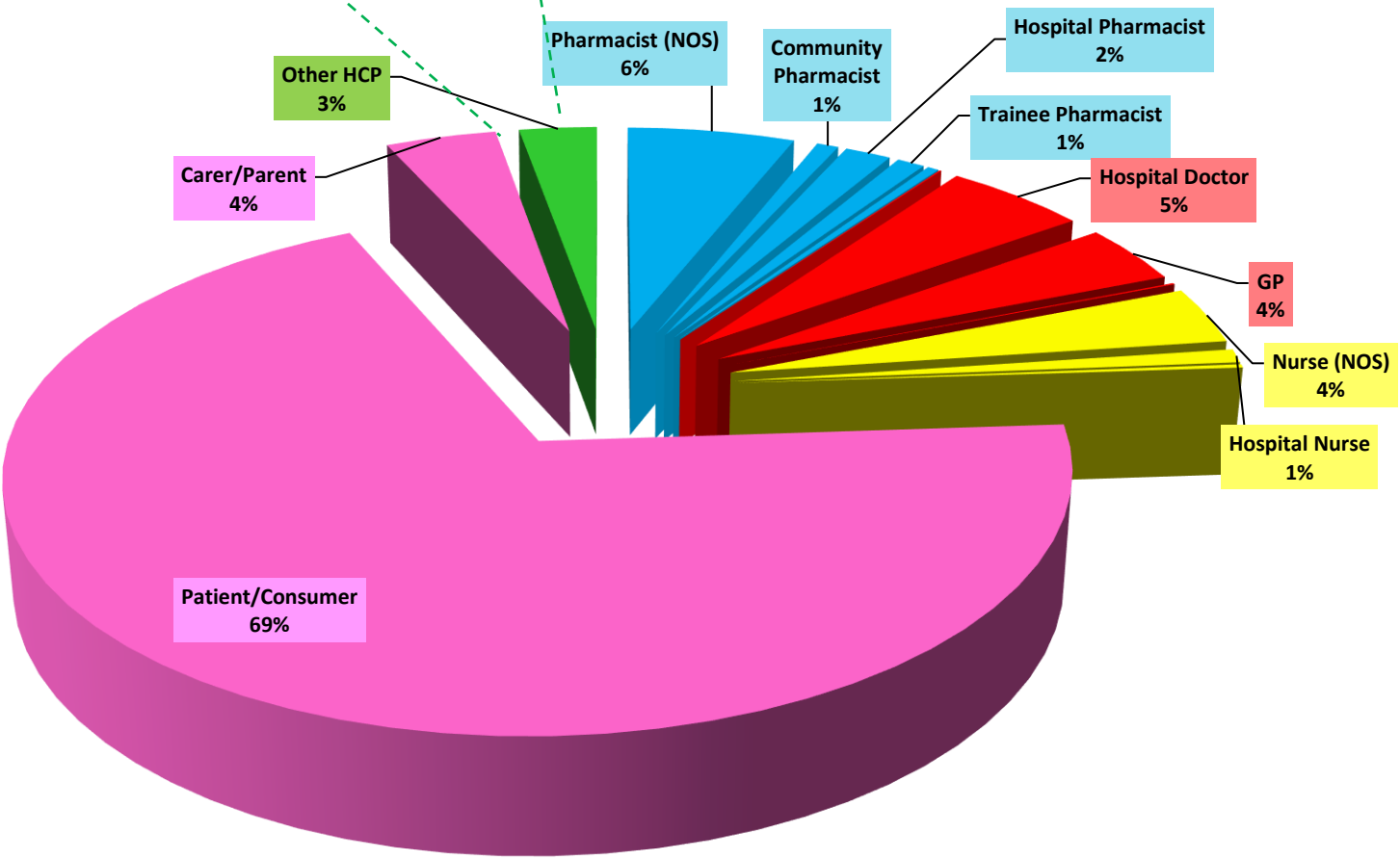


Figure 5b – Percentage of reports for individual reporter type, coloured to reflect the five primary reporter groups in Figure 5a

NB: Figure 5b also includes reports of <1% total from Pharmacy Technicians/Assistants, Medical Students, and Midwives

Table 2 - Reports from hospital staff 2022/23 (Scotland)

Health Board Area	Total reports 2022/23	Hospital reports 2022/23	Hospital reports as a % of Board's total reports	
			2022/23	2021/22
NHS Ayrshire & Arran	162	3	2%	15%
NHS Borders	59	5	8%	17%
NHS Dumfries & Galloway	77	5	6%	7%
NHS Fife	218	9	4%	15%
NHS Forth Valley	143	10	7%	8%
NHS Grampian	324	23	7%	7%
NHS Greater Glasgow & Clyde	671	73	11%	21%
NHS Highland	237	18	8%	22%
NHS Lanarkshire	285	10	4%	18%
NHS Lothian	659	56	8%	17%
NHS Orkney	15	0	0%	0%
NHS Shetland	0	0	0%	0%
NHS Tayside	306	34	11%	10%
NHS Western Isles	16	4	25%	13%
Total (Scotland)	**3172**	**250**	**8%**	**15%**

Table 2 shows the number of reports submitted by each health board, and the number, and proportion, which originated from reporters who identified as hospital staff in each health board.

NHS hospital staff reports accounted for 8% of all reports in Scotland in 2022/23, which represents a proportional decrease of 3% compared to 2021/22 (15%). However, the number of reports had increased from 219 reports in 2021/22 to 250 reports in 2022/23 for this group.

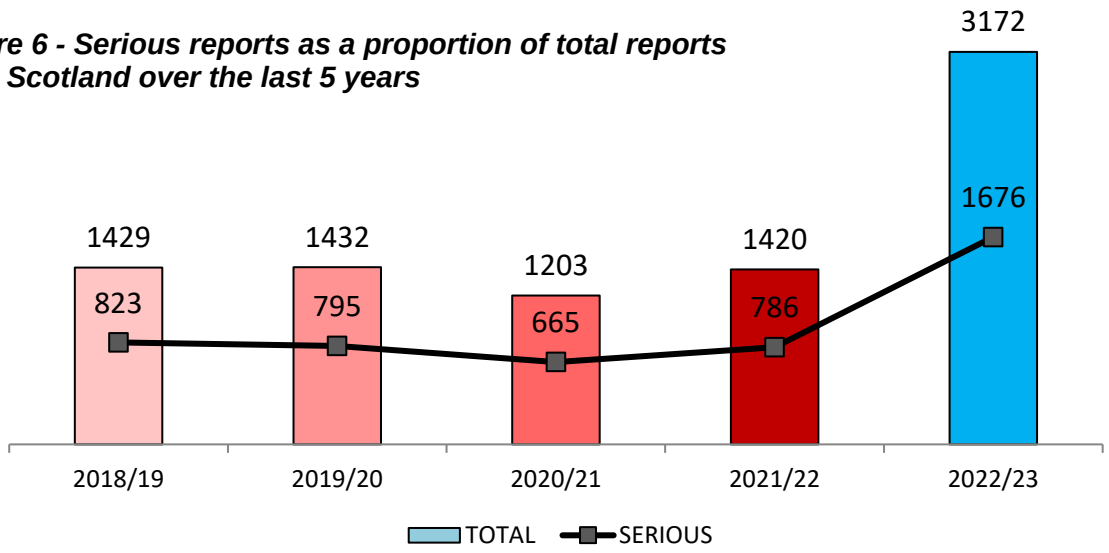
3c Serious Reports

Table 3 - Serious reports over last five years (Scotland)

Year	Number of serious reports	Percentage of total reports	Percentage change on previous year
2018/19	823	58%	−1%
2019/20	795	56%	−3%
2020/21	665	55%	−16%
2021/22	786	55%	+18%
2022/23	**1676**	**53%**	**+113%**

Table 3 and **Figure 6** show the number and proportion of reports classed as serious that originated from Scotland in 2022/23, and the trend over the last 5 years. Despite the increase in total number of serious reports, the overall proportion of reports classed as serious remains unchanged. Further review of reports by patient groups categorising events as serious align with many known side effects. A fatal outcome was reported in **56** Yellow Card reports in 2022/23 as shown in **Table 4**.

Figure 6 - Serious reports as a proportion of total reports from Scotland over the last 5 years



3d Fatal reports*

Table 4 - Number of fatalities reported for Scotland in patients with suspected side-effects in association with medicines over the last five years

Year	Number of fatal reports	% change on previous year
2018/19	78	−18%
2019/20	42	−46%
2020/21	33	−21%
2021/22	29	−12%
2022/23	**56**	**+93%**

• It is important to note that suspected adverse drug reactions do not necessarily have an established causal link between the suspect medicines and the fatal outcome.

3e Age Banding (Scotland)

Tables 5 to 7 and **Figure 7** show the number of Yellow Cards reported in Scotland, stratified by the patient's age, for the past 3 years.

Table 5 - Age Banding Reports Scotland over the last 3 years

Age Banding	Reports 2022/23	Reports 2021/22	Reports 2020/21
Unknown	618	114	38
Under 2 years	32	35	56
2–6 years	39	28	31
7–12 years	34	30	19
13–17 years	45	51	42
18–24 years	131	113	84
25–34 years	264	192	158
35–44 years	330	160	130
45–54 years	423	194	150
55–64 years	482	207	155
65–74 years	497	173	188
75+ years	277	123	152
TOTAL	**3172**	**1420**	**1203**

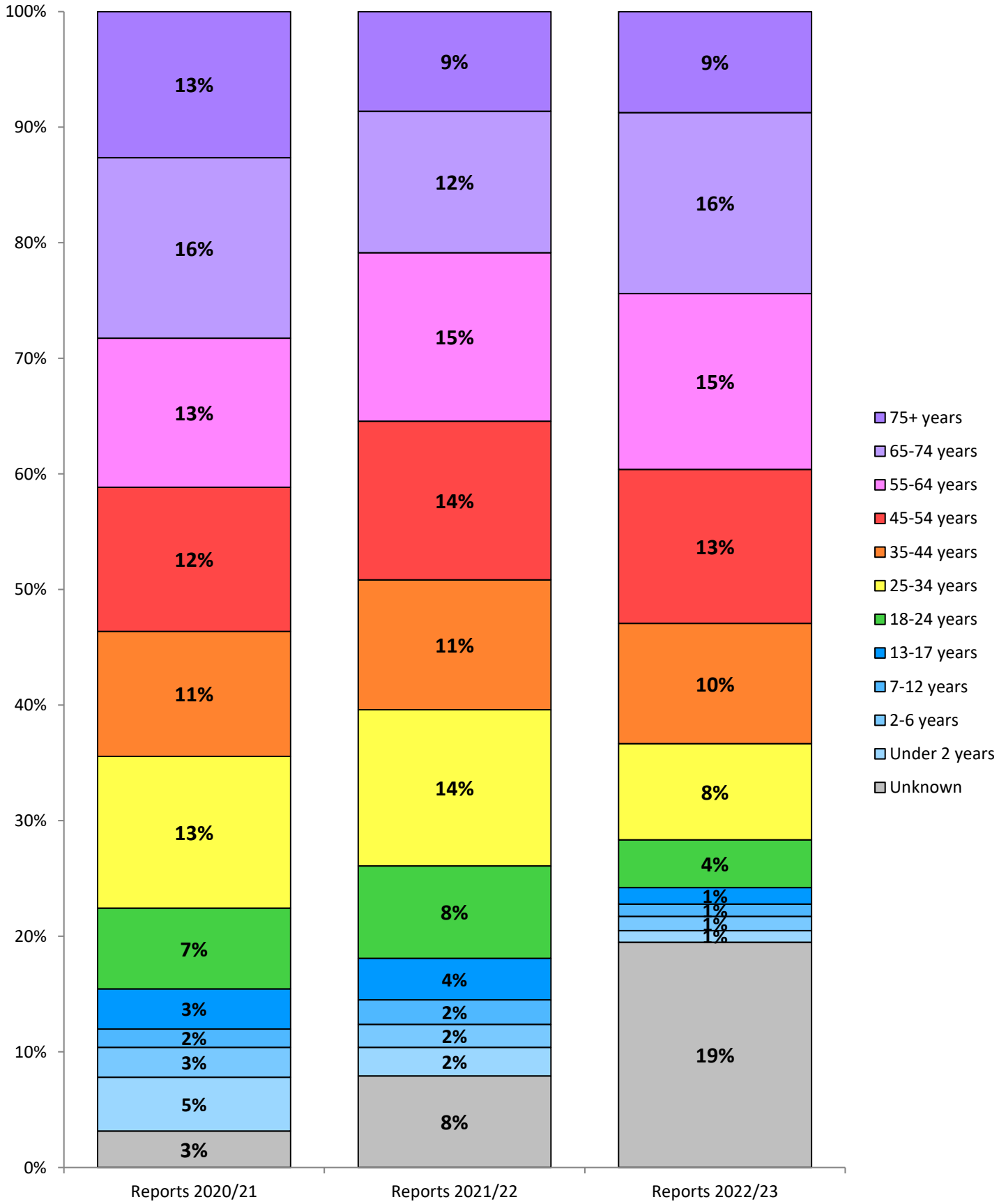
Table 6 - Age Banding Paediatric Reports Scotland 2022/23

Age Range	Number of Paediatric Yellow Card Reports	% of Paediatric Yellow Card Reports
Children (0–11 months)	10	7%
Children (12–23 months)	22	15%
Children (2–11 years)	64	43%
Adolescents (12–17 years)	54	36%
TOTAL	**150**	

Table 7 - Age Banding over 65 years Reports Scotland 2022/23

Age Range	Number of over 65 yrs Yellow Card Reports	% of over 65yrs Yellow Card Reports
65–74 years	497	64%
75–84 years	228	29%
85–94 years	47	6%
95+ years	2	0.3%
TOTAL	**774**	

Figure 7 - The percentage of Yellow Card reports from Scotland, stratified by age group over the last 3 years



3f Top 10 Suspected Medicines

Table 8 - Scottish top ten suspected medicines reported 2022/23 & 2021/22

	2022/23		2021/22	
Rank	**Drug Name**	**Reports**	**Drug Name**	**Reports**
1	COVID-19 Vaccine ▼	1345	Influenza Vaccine	136
2	Influenza Vaccine	178	Nirmatrelvir/Ritonavir (Paxlovid) ▼	35
3	Nirmatrelvir/Ritonavir (Paxlovid) ▼	134	Ivacaftor containing regimen Kalydeco (n=5) Symkevi▼ (n=2) Kaftrio▼ (n=24)	31
4	Pneumococcal Vaccine	89	Sertraline	24
5	Sertraline	43	Estradiol	20
6	Varicella Zoster Vaccine	41	HPV Vaccine	19
7	Flucloxacillin	29	Vedolizumab	18
8	Doxycycline	28	=Doxycycline =Ciprofloxacin	17
9	=Atorvastatin =MMR Vaccine	25	—	
10	—		=Metronidazole =MMR Vaccine	16

Table 9 - Top Five Medicines reported for paediatrics and aged 65+ in 2022/23 (Scotland)

	Paediatrics	65 Years Plus
1	COVID-19 Vaccine ▼ (n=29)	COVID-19 Vaccine ▼ (n=403)
2	Influenza Vaccine (n=26)	Pneumococcal Vaccine (n=55)
3	MMR Vaccine (n=20)	Influenza Vaccine (N=51)
4	=HPV Vaccine (n=7) =Varicella Zoster Vaccine (n=7)	Nirmatrelvir/Ritonavir (Paxlovid) ▼ (n=38)
5	—	Varicella Zoster Vaccine (n=27)

Notes
▼ Black triangle status (medicines subject to additional monitoring) at time of report – in some cases this is brand specific

3g Sources of Reports

Table 10 – Detail for Scottish reports stratified by reporter over last 3 years

Reporter	2022/23		2021/22		2020/21	
	Number	% of total	Number	% of total	Number	% of total
Carer	6	<1%	19	1%	20	2%
Consumer	75	2%	4	<1%	1	<1%
Parent	121	4%	86	6%	64	5%
Patient	2121	67%	734	51%	423	35%
Community Pharmacist	25	1%	18	1%	25	2%
Hospital Pharmacist	53	2%	49	4%	161	13%
Pharmacist	192	6%	115	8%	57	5%
Pharmacy Assistant	13	<1%	2	<1%	-	-
Trainee Pharmacist	32	1%	23	2%	12	1%
Hospital Nurse	28	1%	36	3%	88	7%
Nurse	118	4%	82	6%	62	5%
GP	123	4%	72	5%	85	7%
Hospital Doctor	164	5%	127	9%	157	13%
Physician	2	<1%	7	1%	1	<1%
Paramedic	1	<1%	3	<1%	-	-
Dentist	15	<1%	13	1%	2	<1%
Midwife	7	<1%	1	<1%	2	<1%
Optometrist	3	<1%	2	<1%	2	<1%
Chiropodist	2	<1%	-	-	-	-
Radiographer	33	1%	7	1%	14	1%
Hospital Healthcare Professional	5	<1%	7	1%	11	1%
Healthcare Assistant	11	<1%	1	<1%	-	-
Other Healthcare Professional	19	1%	10	1%	13	1%
Medical Student	3	<1%	2	<1%	3	<1%
Unknown	0	0	-	-	-	-
Total	**3172**		**1420**		**1203**	

3h Types of reports (Scotland)

Table 11 - Report submission routes

Report Type	2022/23		2021/22	
	Number	% of total	Number	% of total
App	968	31%	110	8%
Electronic Yellow Card	2076	65%	1208	85%
MiDatabank (Pharmacy Medicines Information)	39	1%	21	1%
Paper	45	1%	31	2%
Vision (GP system)	44	1%	50	4%

Table 11 shows the ways in which reporters in Scotland submitted Yellow Cards in 2022/23 compared with 2021/22.

In response to the increased dependence on digital solutions for promoting and teaching, YCC Scotland have been working closely with NHS Education for Scotland to review the current e-Learning modules on the TURAS platform and improve accessibility. The 6 e-Learning modules have been used in previous years as part of blended learning with positive feedback.

4. Discussion of Yellow Card Data

Including COVID-19 vaccine reports, a total of 3172 Yellow Card reports were submitted in Scotland in 2022/23.

Comparisons with the previous year's data are complicated by a change from the MHRA using a dedicated COVID-19 platform to the standard Yellow Card reporting pathway for the COVID-19 vaccine. Within this report, the data for 2022/23 largely includes reports for COVID-19 vaccines, but is compared to data for 2021/22 which excluded COVID-19 vaccines.

In 2021/22, 23,438 reports were submitted (1420 Yellow Card reports and 22,018 COVID-19 vaccine reports).
In 2022/23, 3172 reports were submitted (1827 non-COVID-19 vaccine reports and 1345 COVID-19 vaccine reports).

Comparing 2022/23 total number of Yellow Card reports (3172) with 2021/22 (1420) represents an overall increase of 124% in Yellow Card reporting. This increase can be partly attributed to reports for COVID-19 vaccines (n=1345) which are included in the standard dataset as of July 2022, whereas in previous years they were listed separately.

Excluding the reports for COVID-19 vaccines leaves a total of 1827 reports, which still represents an increase of 29% from the previous year's standard reporting data.
This figure now exceeds pre-pandemic reporting levels without considering COVID-19 vaccine reports. Prior to the pandemic, reporting averaged around 1440 reports annually from the 5 years prior to the pandemic (April 2015 to March 2020 inclusive).

Reporter Groups trends:

- **Patient groups:** Reporting by patients, parents, and carers accounted for 73% of the total reports in Scotland (and 85% of the Covid-19 vaccine reports). This represents another substantial increase and reflects a better awareness of the Yellow Card Scheme.
- **Healthcare professionals:** Reporting by healthcare professionals increased in number but decreased in proportion accounting for only 27% of the total reports. Despite a +47% increase in the total number of reports submitted (from 577 in 2021/22 to 849 in 2022/23) the proportion of reports from HCPs is notably much lower than in 2021/22, when it was 41% of all reports. Almost all groups noticed an increase in reporting and specific mention is made to the 371% increase from last year by radiographers across ten different health board areas with suspect substances ranging from COVID-19 vaccine to typically used medicines in a radiology department.

Submission routes:

- **MiDatabank (Pharmacy Medicines Information system):** Reporting via MiDatabank has improved in 2022/23, representing a 86% increased compared to the previous year. Of these, 48% were reported from NHS Lothian and 28% from NHS Tayside. Research is almost complete in NHS Lothian to further explore the barriers to medicines information (MI) pharmacists reporting e-YC via *MiDatabank*.

Health board trends:

- **Top 3 reporting health boards (per 100,000 population):** NHS Tayside, NHS Highland and NHS Lothian.
- **Notable increase:** NHS Fife displayed a notable increase in reports, increasing by +176% in 2022/23 compared to 2021/22.

Suspect Medicines;

- **Range of medicines:** It should be noted that, excluding vaccines, the range of suspect medicines reported is very diverse. In 2022/23 there were 444 different suspect medicines reported (for 3172 reports). Excluding the COVID-19 vaccine, 443 different suspect medicines were included within 1827 report. It is noted that some reports include multiple suspect medicines. This is a reduction on last year where 460 different suspect substances were included in reports. 42% of reports were for COVID-19 vaccines and 6% of the total reports were for the second top suspect medicine, the influenza vaccine.
- **Top 10:** Notably in 2022/23, the third top reported suspect medicine was Paxlovid (nirmatrelvir/ritonavir), with pneumococcal vaccine remaining prominent while generic medicines sertraline, flucloxacillin, doxycycline and atorvastatin feature.
- **Paxlovid (nirmatrelvir and ritonavir)▼:** Paxlovid was granted a Conditional Marketing Authorisation (CMA) for the treatment of mild to moderate COVID-19 in adults who do not require supplemental oxygen, and are at increased risk for progression to severe COVID-19. Paxlovid was introduced in the last quarter of 2021/22, and as a new drug under additional monitoring (black triangle) it is not surprising to see these reports. It was adopted into national guidance for non-hospitalised patients and as health boards preparaed patient pathways for assessment of patients and prescription of this medicine, there has unsurprisingly been an increase in the number of reported adverse reactions by 283%.
  Of the total, 76% were non-serious. The most commonly reported reactions were consistent with the most common side effects reported in clinical trials (diarrhoea, nausea and altered sense of taste). Advanced age was included in the eligibility criteria and will have influenced the presence of reports for patients who are 65 years and over.
- **Sertraline:** 63% of reports were from patients, with a spread across Scotland. The reported reactions were in keeping with the known side effect profile including gastrointestinal, nervous system, sex hormone dysfunction, mood and skin reactions were reported.
- **Flucloxacillin, doxycycline and atorvastatin:** The reported reactions were in keeping with the known side effect profiles.
- **Paediatrics:** Vaccines remain the most commonly reported suspect medicines, as in previous years.

Serious ADRS:

- 1676 reports were classed as serious (53% of total), a similar proportion of the total as in previous years. Healthcare professionals are more likely to report serious reactions (i.e. those that are life-threatening, cause or prolong hospitalisation or are debilitating). Patients frequently report non-serious reactions (not life-threatening or resulting in hospitilisation) as serious. This limits interpretation of trends.
- **Fatal:** a fatal outcome was reported in 56 reports*

*It is important to note that suspected adverse drug reactions do not necessarily have an established causal link between the suspect medicines and the fatal outcome.

5. Promotional activities

5a Training delivered to healthcare professionals and their respective groups

NES/YCCS ADR e-learning modules

The NES/YCCS ADR modules are hosted in NES *Turas Learn* for all users, but data on number of users is not yet available on this new platform.

Table 12 - Training delivered to healthcare professionals and their respective groups

Audience	Session	Duration (hours)	No of sessions	Total attendees	Total hours Training
Non-Medical Prescribers	ADR & Yellow Card Training Session	2.5	7	176	17.5
Non-Medical Prescribers	Non-Medical Prescribers Leads Group Update	1	2	27	2
Pharmacists	Yellow Card Teaching & Promotion	0.75	2	44	1.5
Senior Healthcare Professionals	ADTC Collaborative Update	0.5	1	30	0.5
Healthcare Professionals	Grand Rounds ADR Teaching & Promotion	1	1	85	1
Toxicologist	Individual Training Session	1	3	3	3
Totals			**16**	**365**	**25.5**

Additional activity included contacting the Communications departments for all geographic Scottish health board areas with digital banners to promote adverse drug reactions and pharmacovigilance on their websites and intranet pages, and providing digital banners and informational slides to be displayed during virtual conferences for Scottish healthcare professionals.

5b Training delivered to patients and their respective groups

Table 13 - Patient Group Engagement

Audience	Session type	Duration (hours)	Number of sessions	Audience numbers	Total staff hours
Member of the Public	Telephone Conversation	0.25*	6	6	1.5
Member of the Public	Email Conversation	0.3*	4	4	1.2
*Average number of hours across all instances; actual time spent for each instance ranged from 0.1 hours to 0.5 hours					

Although face-to-face activities began operating again throughout 2022/23, YCCS did not attend any events in person and primarily maintained an online presence. YCCS continued to receive queries from the public via email, Twitter and telephone. YCCS supported members of the public to report suspected reactions to their medications and to seek appropriate medical advice where appropriate.

5c Training delivered to undergraduates

Table 14 - Training delivered to Undergraduates

Audience	Session	Duration (hours)	No of sessions	Total attendees	Total hours
Undergraduate Medical Students	ADR Teaching Session	2	1	~200	2
Postgraduate Internal Medicine Students	ADR Teaching Session	2	1	~50	2
Total			**2**	**N/K**	**4**

6. Publications

1. Haslam E, Wilson K, Bollington L, **Maxwell S**. The prescribing safety assessment: Looking to the future. Pharmacol Res Perspect. 2023 Apr;11(2):e01073. doi: 10.1002/prp2.1073.

2. Power A, Stewart D, Craig G, Boyter A, Reid F, Stewart F, Cunningham S, **Maxwell S**. Student and pre-registration pharmacist performance in a UK Prescribing Assessment. Int J Clin Pharm. 2022 Feb;44(1):100-109. doi: 10.1007/s11096-021-01317-z.

7. YCCS Website/Social Media

7a Website Updates

The YCCS website on SHOW has been maintained and updated to reflect the most current information. Simon Maxwell has written a second article for the YCCS website blog, discussing adverse drug reaction monitoring in a post-pandemic world.

In order to comply with GDPR regulations, a consent banner would need to be implemented to obtain usage data for the website. After investigation into the feasibility of this, it was decided that this information will no longer be gathered so as to keep the website as user-friendly and uncomplicated as possible.

7b Social Media Statistics

Twitter

Table 16 - Twitter analytics over the last 3 years

	2022/23	2021/22	2020/21	% change 2021/22 to 2022/23
Number of Followers	1470	1462	1366	0%
Tweets sent	40	75	98	−47%
Total number of Engagements*	492	951	713	-48%
Impressions**	20,372	40,220	77,110	−49%

*Engagements are when a follower interacted with a tweet

**Impressions are the number of tweets delivered to twitter feeds

The number of followers for the YCCS Twitter account has not changed significantly over the last year, though it is difficult to say what effects the changes to the management of Twitter will have had. The number of posts from YCCS was considerably lower in 2022/23 compared to 2021/22, and the number of engagements and impressions are similarly lower. Efforts will be made to prevent any further decline in the use of the social media platform, and posts will be scheduled on a more regular basis going forward in 2023/24.

The top Twitter posts for 2022/23 were all posts relating to Medicines Safety week, with a combined total of 11348 impressions and 248 engagements across six separate posts.

8. Research and ongoing initiatives

- MiDatabank e-YC reporting. Research is currently underway in NHS Lothian to explore the barriers to medicines information (MI) pharmacists reporting e-YC via *MiDatabank* (MSc Advanced Pharmacy; Louise Smith NHS Lothian).
- Identifying barriers to reporting for professional groups – in 2023 the focus will be with primary care pharmacy colleagues with scope to expand to other professional groups across the territorial boards (Quality Improvement; East Region Trainee Pharmacists, Education Research and Development and Louise Smith NHS Lothian).

9. Conclusion

The known pressures within the health service and society in general have continued to influence Yellow Card reporting, and the activities of the Yellow Card Centre for Scotland throughout 2022/23. It is encouraging to note a further increase in reporting by patient groups and that numbers of reports (excluding COVID-19 vaccines) now exceed pre-pandemic levels.

During the 2022/23 period the service had a change in leadership. During this time of transition, the team continued to deliver training and promotion using similar methods used during pandemic times.

The team will use the data and analysis from this report to inform planning for 2023/24, continuing to build on the increased reporting with patient groups and selected professional groups while targeting low reporting groups and health boards.

As a centre for a devolved national, YCC Scotland recognise that the messaging from the MHRA on the promotion of the Yellow Card scheme for medical devices in England and Wales may have an impact on reporting in Scotland. The impact of mixed models for reporting will be closely monitored and discussed with advisory group members where IRIC have representation.

Moving forward, YCC Scotland will focus on harnessing innovative technology to support integrated digital reporting in clinical settings while also rejuvenating the communications strategy is response to patient and professional needs in a post-pandemic world.

10. Acknowledgements

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Yellow Card Centre Scotland Advisory Group

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- Karen Harkness, Principal Medicines Information Pharmacist, NHS Tayside
- Scott Hill, Area Drug and Therapeutics Committee Collaborative National Clinical Lead
- Susan McGilp, Incident Reporting & Investigation Centre (IRIC) Co-ordinator
- Professor Tom MacDonald, Professor of Clinical Pharmacology & Pharmacoepidemiology, University of Dundee
- Jane Harris, Programme Director for Nursing and Midwifery, NHS Education for Scotland
- Peter Hamilton, Principal Lead for Professional Development, NHS Education for Scotland
- Catriona Sinclair, Community Pharmacy Scotland (CPS) Representative
- Sue Cole, Patient Representative

Abbreviations and descriptions

YCCS	Yellow Card Centre Scotland
YC	Yellow Card
ADR	Adverse Drug Reaction
HCP	Healthcare Professional
ADTC	Area Drug & Therapeutics Committee
NES	NHS Education for Scotland
TURAS	NHS Education for Scotland's single, unified platform
UG/PG	Undergraduate/Postgraduate
MHRA	Medicines and Healthcare Products Regulatory Agency