

# YellowCard Centre Scotland

Centre for Adverse Reactions to Drugs (Scotland)  
Helping to make medicines safer.



**Annual Report  
April 2012 to  
March 2013**

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

## **2012-2013**

### **1. STAFF**

Professor Simon Maxwell – Consultant Clinical Pharmacologist, Medical Director  
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Scotland

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### **2. Summary**

The staff of YCC Scotland continues with strategic development and delivery of initiatives to support the work of the Yellow Card Scheme and patient safety with medicines. We have been actively working with the Scottish Government Chief Pharmacist's Office, NHS Education for Scotland, and Health Improvement Scotland to take forward these initiatives throughout Scotland.

Members of the team continue to support and deliver educational sessions and have provided 18 ADR specific presentations to different groups of professionals and students.

Despite this work there has been a 6% decrease in Yellow Card reporting observed in Scotland during 2012/13. This trend is in contrast to the whole of the UK that has had a 9% increase in reporting during the same period. This is a concerning trend that started in 2009 and has not reversed.

The disparity between Scotland and the UK in general could be explained, in part at least, by a number of MHRA initiatives which have developed in England but have not impacted upon Scotland (see Section 3.1).

There were 6 Yellow Cards sent directly to YCC Scotland (i.e. legacy Yellow Cards) which the majority came from Yellow Cards in superseded versions of the BNF which still carried the YCC Scotland address. All processing and follow up has transferred to the MHRA.

## 2. Yellow Card Data Analysis

**Table 1 – Summary of Yellow Card reporting for Scotland and the UK 2012/13 compared to 2011/12**

	Reports in 2011-2012	% of UK Total	Reports in 2012-2013	% of UK Total	% Change on Previous Year
<b>(3.1) Total UK Reports (exc. MAH holders)</b>	13216		14380		9%↑
<b>(3.2) Total Scottish Reports</b>	914	7%	858	6%	6%↓
	Reports in 2011-2012	% of Scottish Total	Reports in 2012-2013	% of Scottish Total	
<b>(3.3) Serious Reports Scotland</b>	482	51%	478	56%	1%↓
<b>(3.4) Black Triangle Reports Scotland</b>	289	32%	316	37%	9%↑
<b>(3.5) Fatal Reports Scotland</b>	27	3%	38	4%	41%↑

### 3.1 Total Scottish Reports

Table 1 above shows the total Scottish Reports decreased by 6% from 914 in 2011/12 to 858 in 2012/13. Figure 1 shows the reporting trend for Scotland since 2002. A steady rate of decline is observed from 2008 onwards.

The total number of UK reports increased from 13216 in 2011/12 to 14380 in 2012/13 demonstrating an increase of 9%. The disparity between Scotland and the UK in general may be partly associated with a number of MHRA initiatives which have developed in England but have not impacted upon Scotland. These include:

1) The development of an integrated electronic Yellow Card to the System One GP computer system in England which covers 20% of English GP practises has resulted a 60% increase in GP reporting in that group. As System One is not used north of the border and we are still awaiting a similar link with EMIS and Vision GP systems, Scotland has not been able to benefit from this innovation.

2) The MHRA has worked closely with community pharmacy groups during the implementation of the New Medicines Service in England to encourage Yellow Card reporting and this has resulted in a 120% increase in Yellow Card reporting for community pharmacists in England. Although community pharmacy reporting in Scotland did increase by 42% and this may have been a consequence of MHRA interventions, the initiative appears to have had less impact in Scotland.

3) MHRA publications in the Department of Health GP and Practice Team Bulletin which may also have enhanced GP reporting but would not have been seen by Scottish GPs.

In order to redress this balance and enable Scotland to catch up, a number of remedial measures need to be adopted, including the essential progression of an electronic Yellow Card integrated into EMIS and VISION GP software.

**Figure 1 - Total Yellow Card reports from Scotland 2002 to 2012/13**

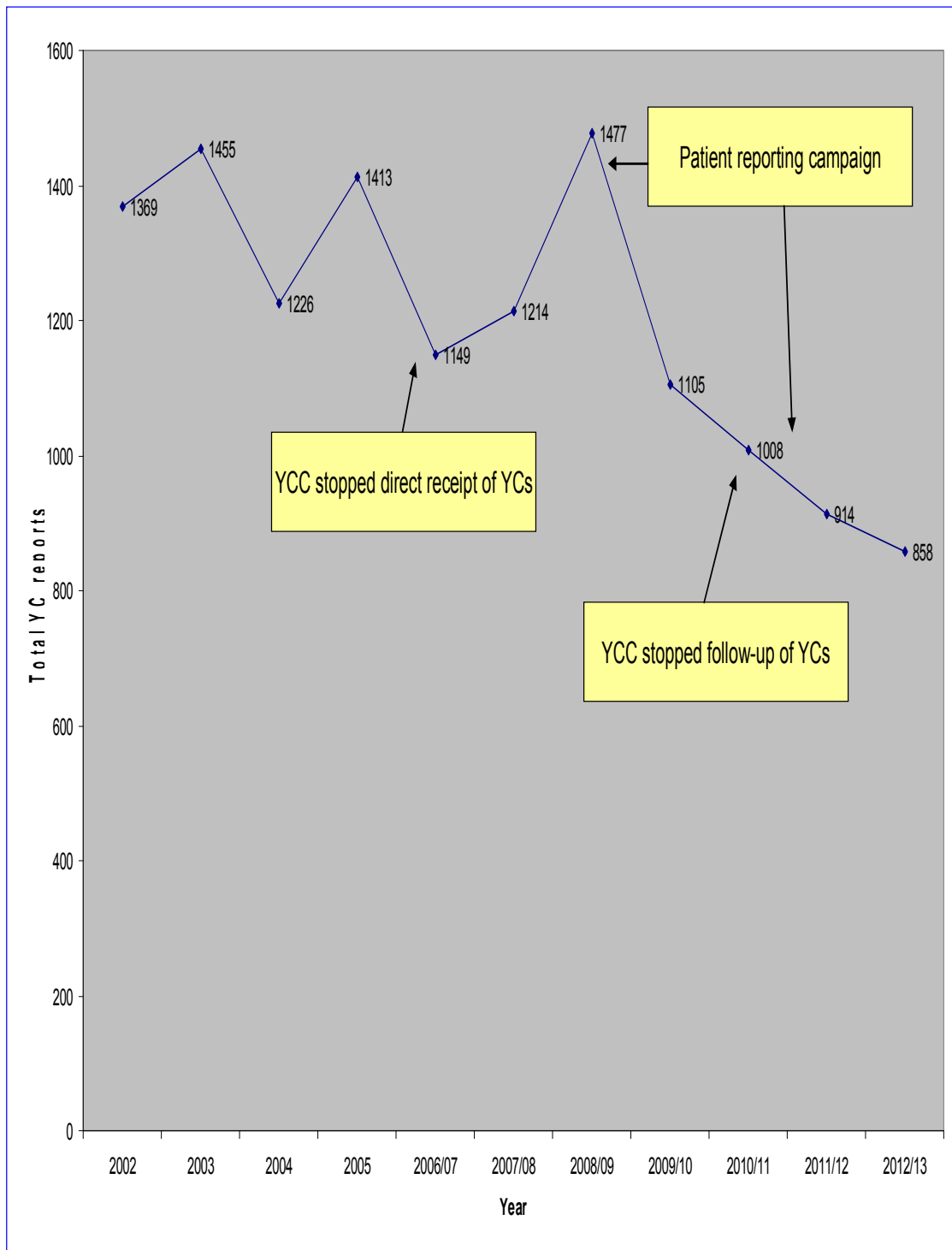
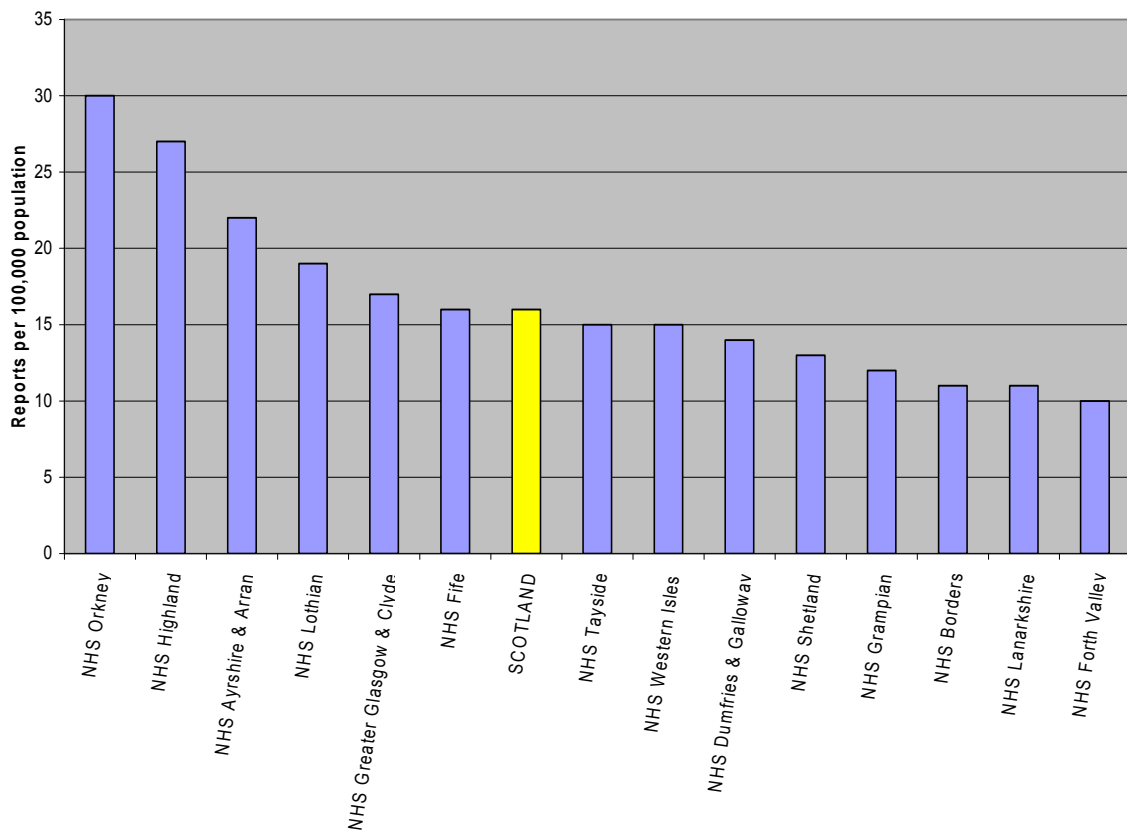


Figure 2 demonstrates the average number of Yellow Card reports per 100,000 population in Scotland is just over 15 with the highest ratio of 30/100,000 being recorded in NHS Orkney which has a relatively low total population compared with the rest of Scotland. The lowest ratio of 10 reports per 100,000 was recorded in NHS Forth Valley. These data allow YCC Scotland to highlight those areas requiring enhanced effort in promoting ADR reporting.

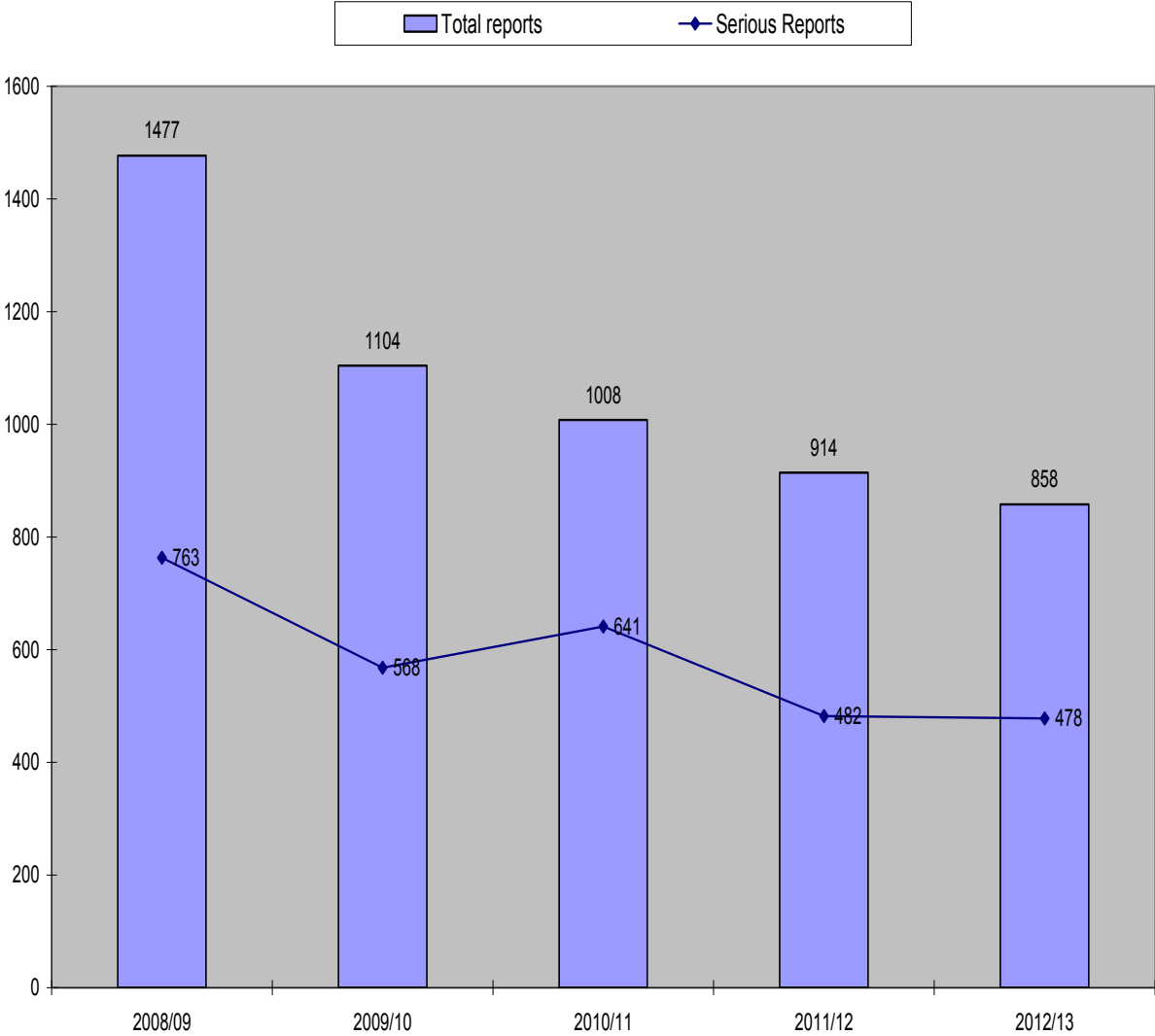
**Figure 2 – Comparison of Yellow Card reports per 100,000 population by Health Board April 2012 to March 2013**



**3.2 Serious Reports (Scotland)**

Figure 3 shows that the number of serious reports from Scotland decreased from 482 in 2011/12 to 478 in 2012/13 showing a 0.8% drop. In 2012/13, 56% of all Scottish reports were classified as serious compared with 51% the previous year. Thus although Scottish reporting in general has dropped, the proportion of serious reports has actually increased. As the HPV vaccine 3-year catch-up scheme involving approximately 100,000 young women receiving the full three-dose course of treatment, drew to a close in September 2011, 2012/13 would be the first full year which did not include any catch-up doses. This could, in part, account for the reduction in non-serious reports as it has been noted previously that nurses in particular had been particularly vigilant in reporting both serious and non-serious ADRs to the HPV vaccine.

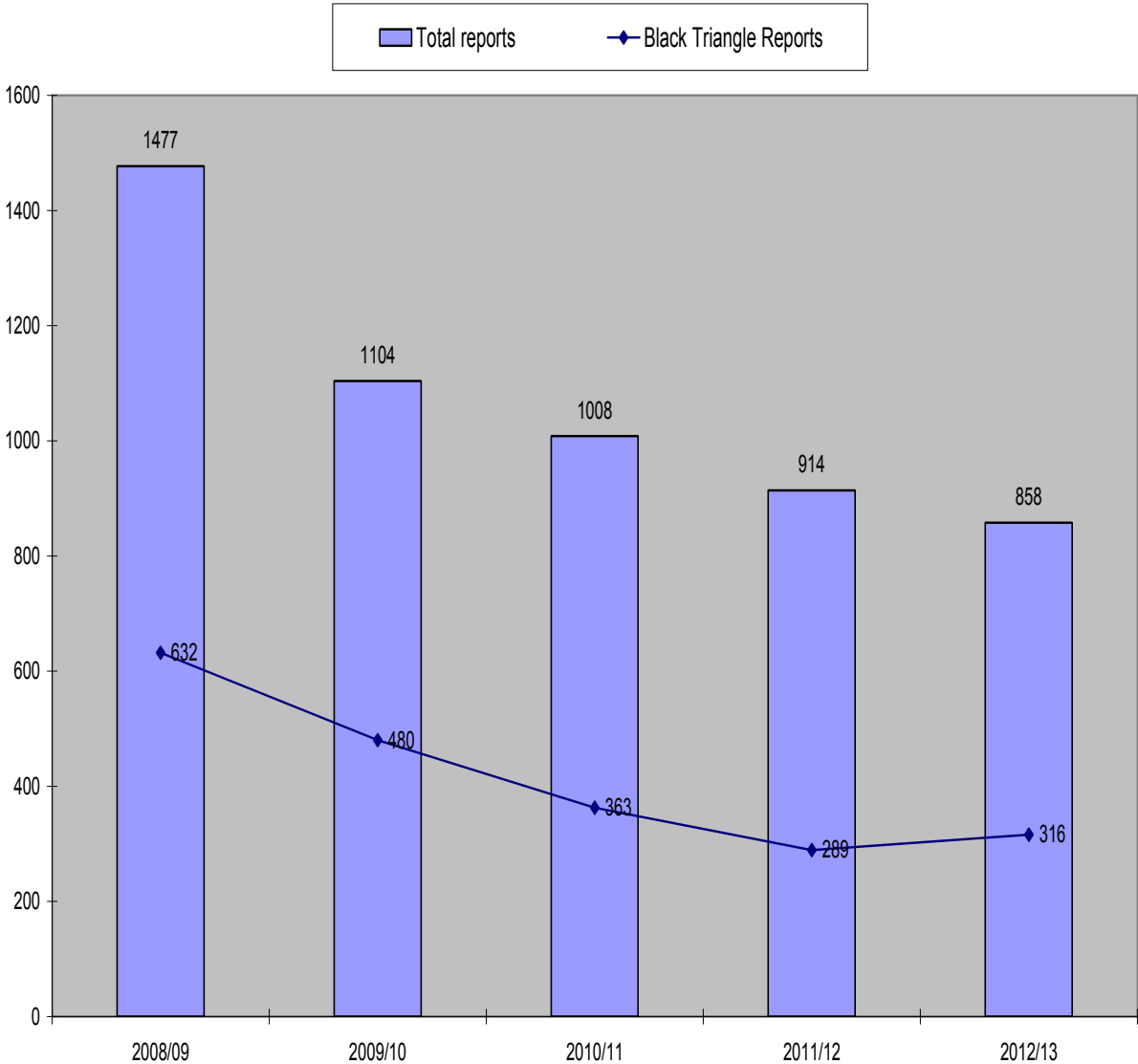
**Figure 3 – Serious reports as a proportion of total reports from 2011/12 and 2012/13**



### 3.3 Black Triangle Reports (Scotland)

Figure 4 shows that Black Triangle reporting in Scotland increased from 289 in 2011/12 to 316 in 2012/13 i.e. a rise of 27 reports resulting in a 9% increase. Whereas in 2011/12 Black Triangle reports represented 32% of all reports, this had increased to 37% of all reports by 2012/13. As the reporting of Black Triangle related ADRs is actively promoted, this trend seems appropriate. Varenicline was again the most frequently reported Black Triangle drug in Scotland in 2012/13 with 115 reports.

**Figure 4 –Black Triangle reports as a proportion of total reports from 2011/12 and 2012/13**



### 3.4 Fatal Reports (Scotland)

The number of fatalities reported for Scotland increased from 27 in 2011/12 to 38 in 2012/13 which is in line with the overall trend involving more reporting of serious ADRs.

### 3.5 Age Banding (Scotland)

Table 2 and Figure 5 shows that reporting in the under 18s has decreased in 2012/13, some of this is associated with the reduction in HPV reporting as the catch-up programme has ceased. When the reporting of children and adolescents is further analysed, as in previous years, the group with the most reports is the 12-18 age band with 61 reports, the majority of which will have been concerning the HPV vaccine (see Section 3.7).

Table 2 and Figure 5 also shows reporting in the over 85s has increased. This is expected in line with a higher proportion of the general population being older and the factors that age and polypharmacy contribute to higher risks for potential ADRs.

**Table 2 - Age Banding Reports Scotland 2011-2012**

Age Banding	Reports in 2011-2012	Reports in 2012-2013	% Change on Previous Year
Child <18	137	101	26%↓
18-24	40	48	20%↑
25-34	92	95	3%↑
35-44	101	105	4%↑
45-54	149	138	7%↓
55-64	149	112	25%↓
65-74	127	122	4%↓
75-84	53	69	30%↑
>85	14	27	93%↑
Age not specified	52	41	21%↓
<b>TOTAL</b>	<b>914</b>	<b>858</b>	

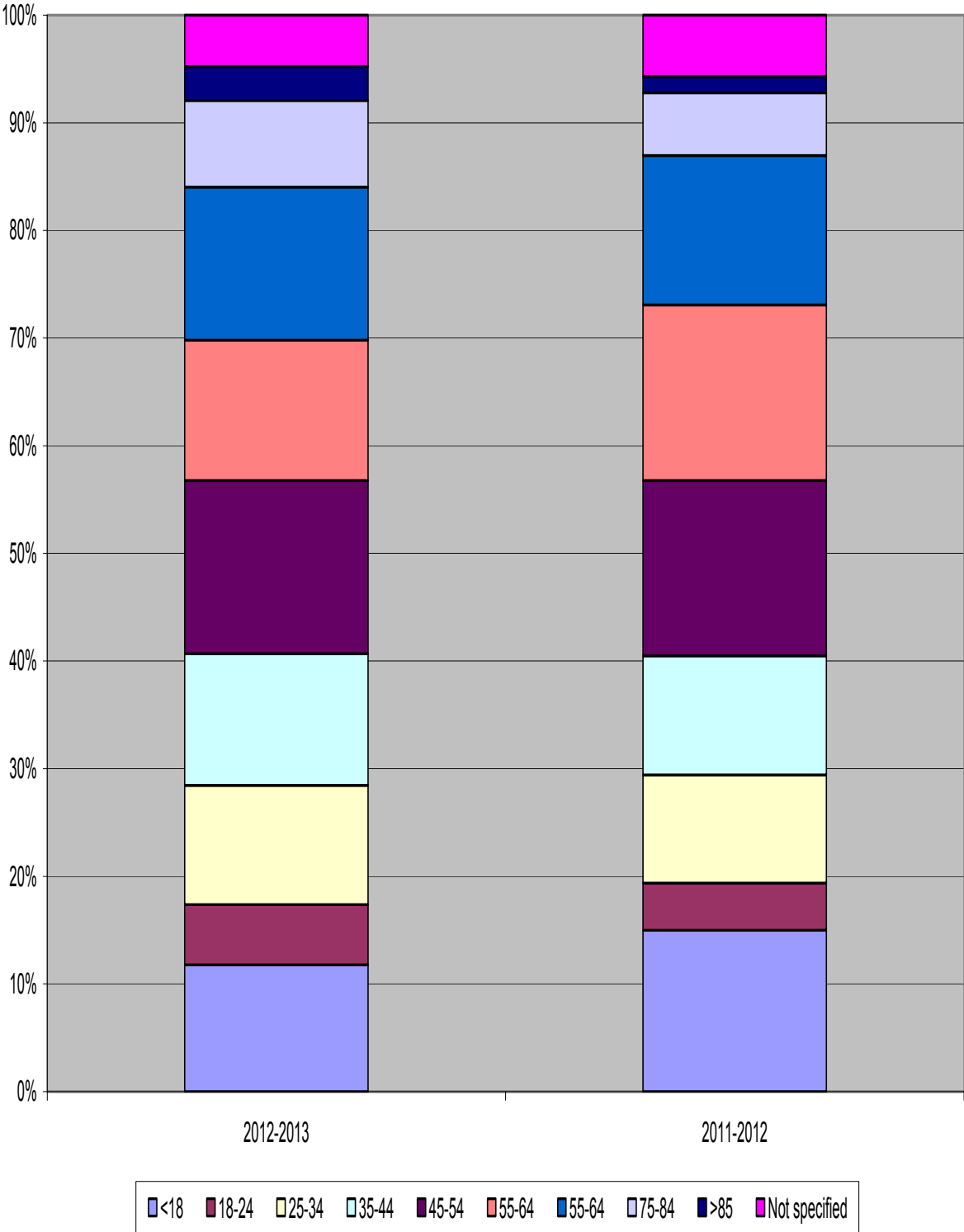
**Table 3 - Age Banding Paediatric Reports Scotland 2012-2013\*\***

ICH Age Range	Paediatric Yellow Card Reports	% of Paediatric Yellow Card Reports
Preterm newborn infants	0	0
Term newborn infants (0-27 days)	4	4%
Infants & toddlers (28 days – 23 months)	18	16%
Children (2-11 years)	30	27%
Adolescents (12-18 years)	61	54%
<b>TOTAL</b>	<b>113</b>	

\*\*Please note that reports for patients aged 18 years old have been included in paediatric report numbers, these patients are part of the 18-24 year old age banding in the Age Banding Reports Scotland 2012-2013 table.



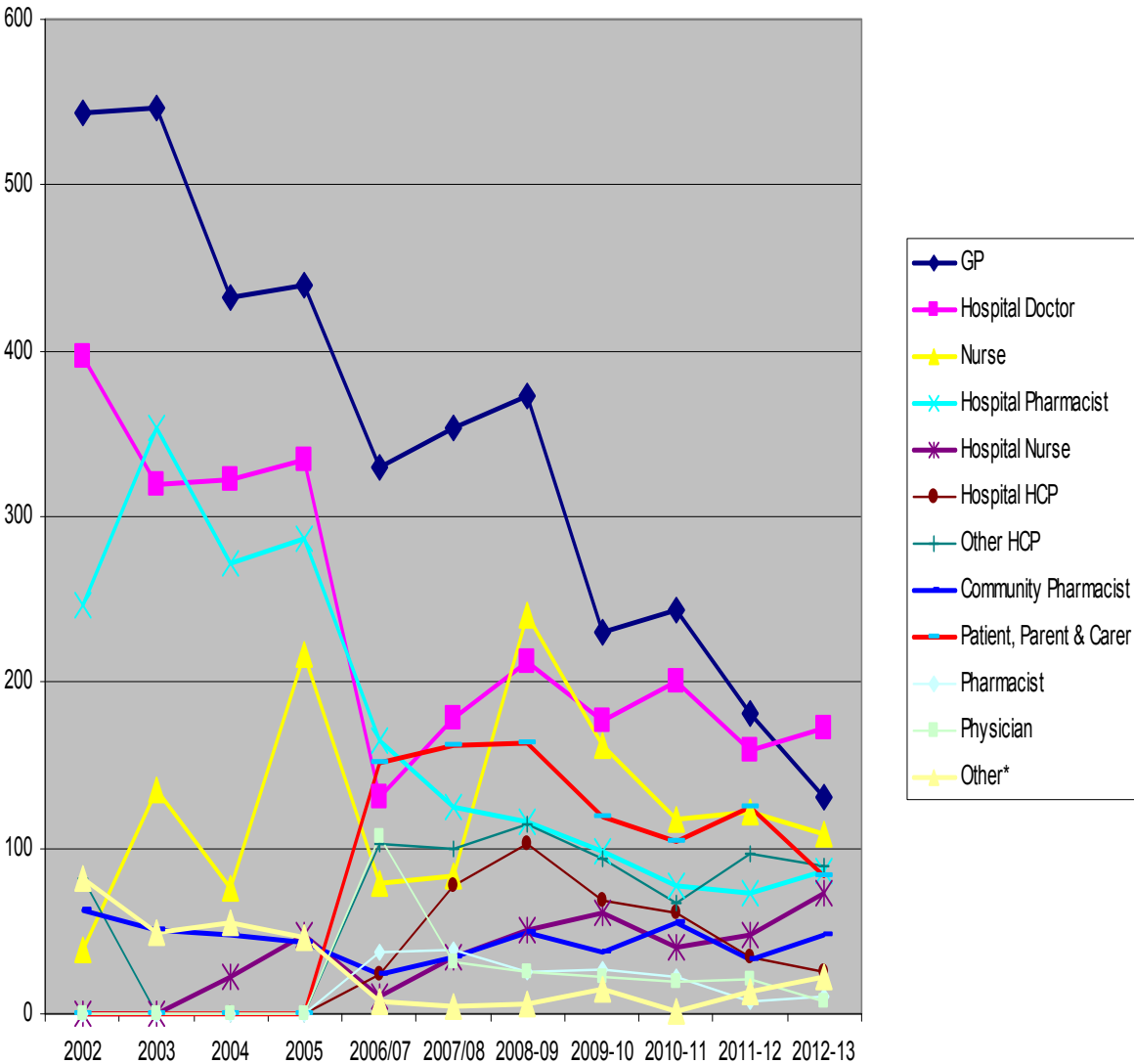
**Figure 5 – The percentage of total Yellow Card reports from Scotland, stratified by age group 2011/12 and 2012/13**



### 3.6 Sources of Yellow Card Reports (Scotland)

Appendix 1 details the source of Yellow Card reports from 2002 to 2012/13. Figure 6 visually demonstrates the rate of decline for the majority of the main reporter groups that contribute to Yellow Card reporting, including patients since 2006/07. All have a decreasing trend that requires reversal to ensure safety signals with medicines are not missed due to a lack of reports via the Yellow Card scheme.

**Figure 6 – Scotland total Yellow Card reports by reporter 2002 to 2013**



**The main points of note are as follows:**

**Healthcare Professionals** submitted 772 reports (a slight overall drop from 789 the previous year) comprising 90% of all Scottish reports while **Patient Groups** submitted 83 reports (reflecting an overall reduction in patient reporting from 125 the previous year) making up the remaining 10%. The previous year Healthcare Professionals submitted 86% of reports and Patient Group submitted 14%.

It may be possible that the Scottish Community Pharmacy Patient Reporting Campaign run in Scotland just prior to the 2011/12 data being gathered had some effect upon patient reporting for that year with some posters and leaflets remaining in community pharmacies for some time and that by 2012/13 this effect has completely worn off. However it is not possible to confirm this hypothesis.

**GPs** reporting decreased by 26% from 181 in 2011/12 to 131 in 2012/13. Thus GP reporting in Scotland decreased from 20% to 15% of the Scottish total and has been showing a general decline over the past ten years. This is the first year in Scotland when Hospital Doctor reports have outnumbered GP reports.

**Hospital Doctors** reporting increased from 159 in 2011/12 to 173 in 2011/12 showing a 9% increase and involving 20% of all Yellow Card reports. As previously noted, it has been possible in England to arrest the downward trend of GP reporting by making the Yellow Card more accessible with the ability to pre-populate it within the System One GP computer system. By contrast in Scotland we have moved away from the GPass system (which had a link to the Yellow Card) towards EMIS and Vision which currently have no electronic links to Yellow Card reporting. As GPs continue to have more and more demands upon their time it seems clear that in order to maintain Yellow Card reporting, additional support will be needed, as is happening with System One. YCC Scotland also plan to increase activity in promoting Yellow Card reporting to GPs over the next year.

**Hospital Nurse** reporting was increased by 55% in 2012/13 with 73 reports compared with 47 in the previous year.

**Hospital pharmacist** reporting increased by 18% (i.e. 86 versus 73) in 2012/13, which can be attributed to the reports sent by medicines information pharmacists electronically via MiDatabank. In 2012/13, a total of 22 reports were received from this group. The full potential of this development within Scotland is pending installation of version 3.1 of this software within all MI centres across Scotland. At present only four of the eight centres are using.

**Community Pharmacist** reporting increased by 42% during 2012/13 from 33 to 47 reports although in general has remained fairly static over the past ten years. The launch of the New Medicines Service in England has been accompanied by MHRA support for community pharmacists which has resulted in a 120% increase in community pharmacist reporting in England and may have had some collateral effect in Scotland.

This was the first year when any reports were identified as being specifically from **Chiropodists (2)**, **Health Care Assistants (2)** and **Midwives (2)**.

### 3.7 Top Medicines Reported

Tables 4 to 6 details the top medicines reported for Scotland compared to the UK in 2012/13; top medicines reported for paediatric patients; and top Black triangle medicines.

**Table 4 - Top Ten Medicines reported 2012-2013**

Ranking	Scotland Medicine Name	Number of reports (Direct only)	UK Medicine Name	Number of reports (Direct and Indirect)
1	Varenicline	115	Clozapine	2538
2	HPV vaccines	34	HPV vaccines	918
3	Diphtheria containing vaccines	22	Varenicline	788
4	Influenza vaccines	21	Adalimumab	387
5	Rivaroxaban	20	Dabigatran	385
6	Etonogestrel	19	Simvastatin	376
7	Adalimumab	14	Etonogestrel	363
8 =	Infliximab	11	Paracetamol	348
8 =	Warfarin	11	Influenza vaccines	326
8 =	Tocilizumab	11	Amoxicillin	322
8 =	Citalopram	11		

\* Reports that listed an unspecified HPV vaccine were included in this count as the brand Cervarix was contracted to supply NHS Scotland.

**Table 5 - Top Five Medicines reported in Paediatric Reports 2012-2013**

Paediatric Ranking	Medicine Name
1	Human papilloma virus vaccine
2	Diphtheria, tetanus and poliomyelitis
3=	Pneumococcal polysaccharide conjugate vaccine Omalizumab
4=	Duraphat (fluorides) Rubella vaccine, measles vaccine, mumps vaccine Poliomyelitis vaccine, diphtheria tetanus pertussis (acellular)and haemophilus type B vaccine
5 =	Varenicline tartrate Meningococcal group C conjugate vaccine

**Table 6 - Top Five Black Triangle Medicines (Scotland) 2012-2013**

Generic Medicine Name	Yellow Card Reports
Varenicline	115
HPV vaccines (Gardasil)	22
Rivaroxaban	20
Etonogestrel	13
Tocilizumab	10

**Varenicline** continues to be the most reported drug for ADRs in Scotland in 2012/13 with 115 Yellow Card submissions, 30 (26%) of which were classified as serious including 7 reports of suicidal ideation, 1 intentional self-injury and 1 completed suicide. Varenicline continues to have Black Triangle status and, as in the previous year, it is the most frequently reported Black Triangle drug. As expected for Black Triangle drugs it has a higher proportion of non-serious reports (74%) compared with the national average of 46%.

**HPV vaccines** ADRs were the second most frequently reported in Scotland and in the rest of the UK in 2012/13 which is the same as in 2011/12 although the number of reports has dropped from 45 to 34. The HPV vaccine used in Scotland changed from Cervarix (non Black Triangle) to Gardasil (Black Triangle) in September 2012 which probably explains the continuing vigilance of monitoring. 15 of the 34 (44%) were considered by the reporter to be serious. HPV vaccine was the most frequently reported product for those aged 18 years and under.

As in previous years, **Diphtheria Containing Vaccines** appear in the Scottish top 10 (3<sup>rd</sup> position with 22 reports of which 10 were serious) and in the top 5 paediatric reports although they do not rank in the UK top 10.

**Influenza Vaccine**, which incorporated the H1N1 strain (pandemic flu), was the fourth most reported product in Scotland with 21 reports and the eighth most reported in the UK.

**Rivaroxaban** was the 5<sup>th</sup> most reported medicine in Scotland with 20 reports. Rivaroxaban had been approved by the SMC for the treatment of DVT in February 2012 and as it is a Black Triangle drug frequent reporting would be expected. Fourteen (70%) of the reports were considered serious with eight of these involving haematological/bleeding problems.

In 6<sup>th</sup> position in Scotland was **Etonogestrel** with 19 reports. This is also in 7<sup>th</sup> position in the UK as a whole and the 4<sup>th</sup> most frequently reported Black Triangle drug in Scotland.

**Adalimumab** was the 7<sup>th</sup> most frequently reported drug in Scotland with 14 reports, 13 of which were considered to be serious. Adalimumab was the 4<sup>th</sup> most commonly reported drug in the UK. The Black Triangle status was removed from Adalimumab during 2012/13.

**Infliximab, Warfarin, Tocilizumab** and **Citalopram** all held 8<sup>th</sup> equal position in Scotland. Only tocilizumab, which was approved by the SMC in 2010 for specialist use in treating rheumatoid arthritis, held Black Triangle Status for part of this year from April to December 2012. Nine of the eleven tocilizumab reports were for serious indications with the two non-serious reports being submitted while it was still under intensive surveillance. All of the reports for infliximab were considered serious as were 10/11 for warfarin and 7/11 for citalopram.

The top 5 **Paediatric reports** included the expected vaccines: **HPV, pneumococcal, MMR** and **meningitis C** however **omalizumab** (Black Triangle), **Duraphat (fluoride)** and **varenicline** were also included.

### **Herbal Reports**

Reporting of ADRs associated with herbal remedies continues to be low. In 2012/13 there were 7 reports of which five were considered to be serious. Four of these reports came from Health Care Professionals and three from patients. This was a slight increase on the previous year when in 2011/12 there were 5 herbal reports (two from patients and three from Health Care Professionals) of which three were considered serious.

#### **4. Interpretation of Reporting Figures**

A total of 858 Yellow Card reports were submitted from Scotland covering 341 different drugs. As in the previous year, in 2012/13 the top two reported products were varenicline and HPV vaccine. Varenicline continues to be under intensive surveillance and the brand of HPV vaccine had changed mid-year with the new brand being under intensive surveillance. The remaining items in the Scottish top 10 are similar to the previous year with tocilizumab and rivaroxaban, which were both newer drugs, joining the top 10 for the first time.

There has been an overall drop of 6% in Yellow Card reporting from Scotland whereas the UK as a whole has shown a 9% increase in reporting. As previously discussed, the addition of the facility to directly populate a Yellow Card on the System One GP computer system appears to have made a significant impact upon GP reporting in England and is an innovation which should be progressed with other systems.

## 5. Activities

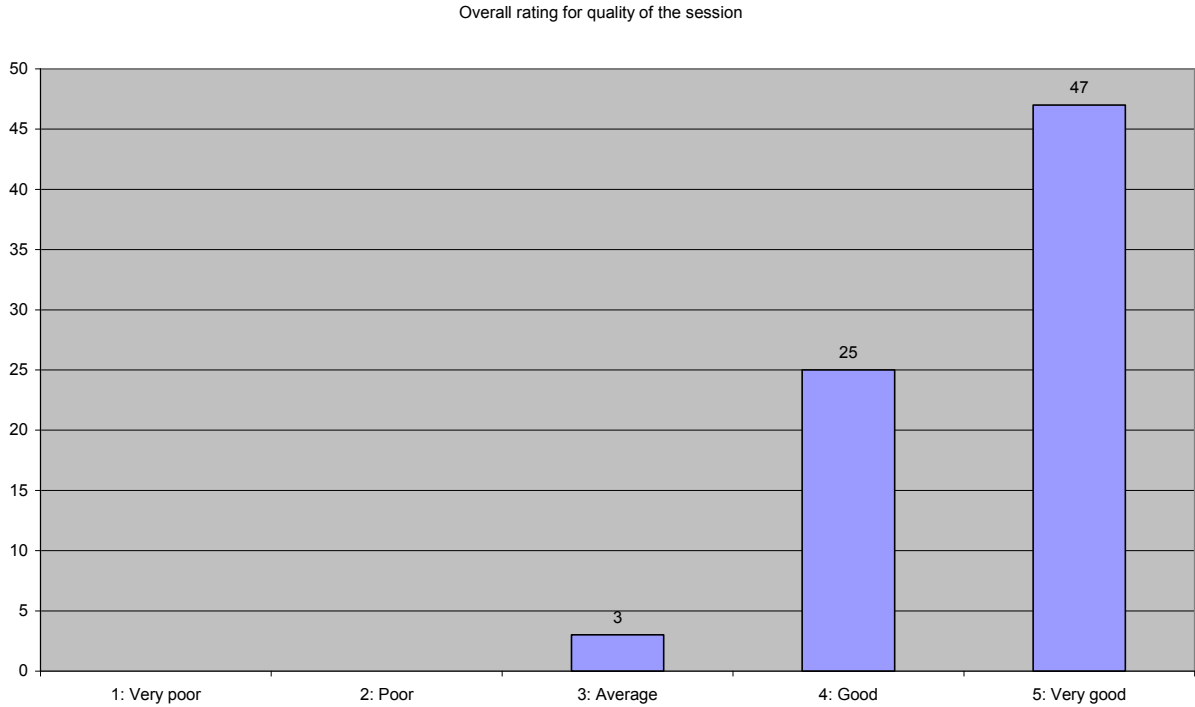
### 5.1 Education

Table 7 below details the face-to-face education and training sessions (undergraduate and postgraduate) under taken by the staff of YCC Scotland in 2012/13.

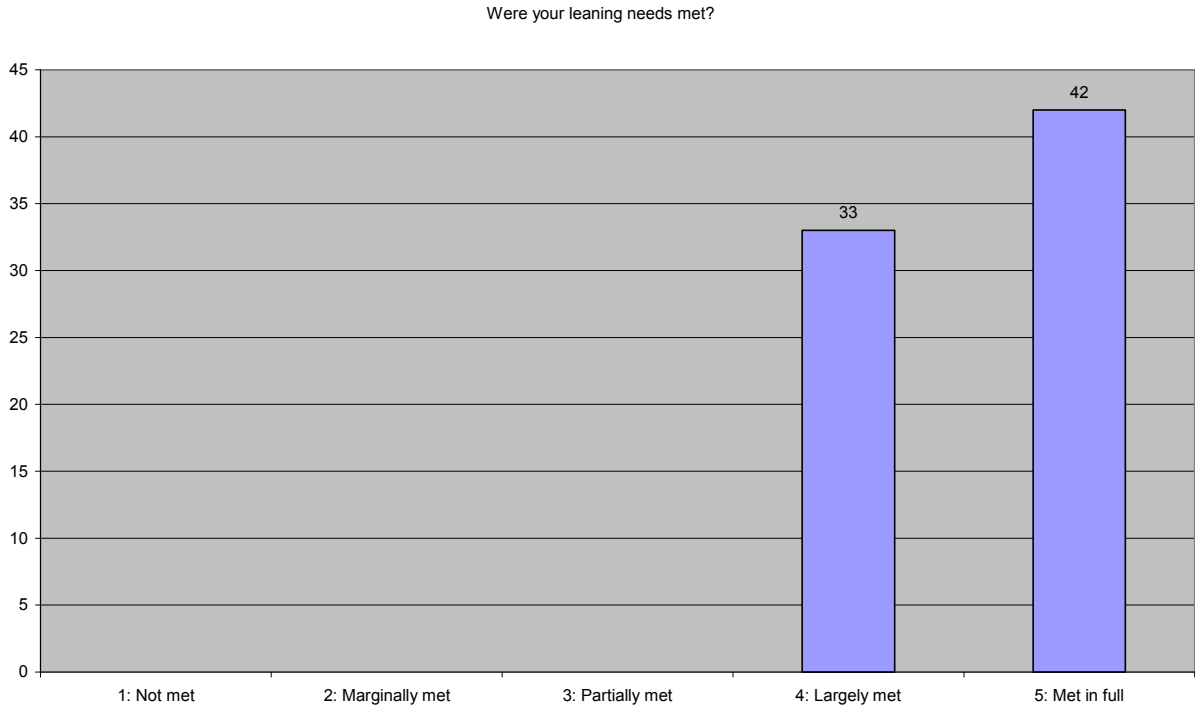
<b>Audience</b>	<b>Session</b>	<b>Duration (hours)</b>	<b>Number of sessions</b>	<b>Total hours training</b>
Biomedical Sciences undergraduates – University of Edinburgh University, Year 4	Lecture/Workshop	3 hours	1	3
Independent prescribers – University of Dundee	Lecture/Workshop	3.5 hours	2	7
“	Observation Day	6 hours	1	6
Independent & Supplementary Prescribers - Napier University	Lecture/Workshop	3 hours	2	6
Medical undergraduates – University of Edinburgh, Year 1 MBChB	Lecture (Adverse Drug Reactions I, II)	2 hours	2	4
Medical undergraduates – University of Edinburgh, Year 3 MBChB	Lecture (Adverse Drug Reactions)	1.5 hours	1	1.5
Medical undergraduates – University of Edinburgh, Year 4 MBChB	Lecture (Prescribing to prescribe)	1 hour	1	1
Medical undergraduates – University of Edinburgh, Year 5 MBChB	Workshop on prescribing	4 hours	2	8
Medical postgraduates – University of Edinburgh, MSc Translational Medicine	Module (Adverse Drug Reactions)	2 hours	2	4
Medical postgraduates – RCPE, MSc Internal Medicine	Lecture (Adverse Drug Reactions I, II)	2 hours	2	4
Nursing undergraduates – University of Edinburgh	Lecture/Workshop	2 hours	1	2
Podiatry MSc postgraduates – Queen Margaret University	Lecture/Workshop	3 hours	1	3
<b>Total</b>			<b>18</b>	<b>49.5 hours</b>

In November 2012 a standard evaluation form was developed and used for 4 sessions delivered (i.e. Biomedical students; non-medical prescribing at Edinburgh Napier University; and non-medical prescribing at the University of Dundee. In total 75 attendees completed the questionnaires. Figures 7 to 9 below show a high level of satisfaction with the programmes delivered and constructive feedback has been used to fine tune future training to fit the needs of the student groups. This questionnaire will continue to be used at future education sessions.

**Figure 7 – Overall rating of the ADR education session**

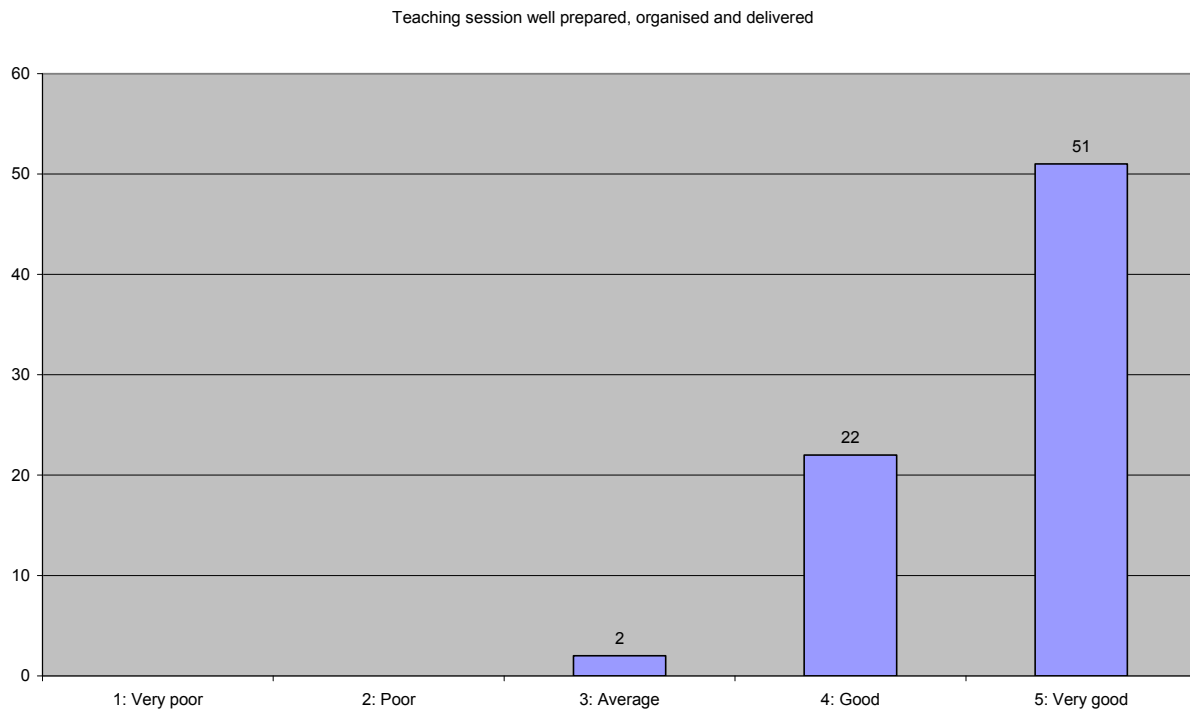


**Figure 8 – Were learning needs met by the ADR education session**





**Figure 9 – Delivery of the ADR education session**



## 5.2 Patient Reporting

Ongoing work to develop this area is ongoing within this financial year but in 2012/13 the following were undertaken:

- NHS Inform Patient Access to Information on Medicines (June 2012). Includes communicating side effects of medicines and reporting and promotes the MHRA translated generic information on the standard Yellow Card Scheme leaflets into other languages to enable more people to report any suspected side effects they may experience whilst taking a medicine.
- Translation of PIL into Gaelic for MHRA website, in line with the Scottish Government Gaelic Language Plan 2008-2013

## 5.3 External/Stakeholder communications

Engagement meetings with stakeholders

- YCC Scotland Advisory Group meetings (September 2012 & March 2013)
- Healthcare Improvement Scotland Medicines Strategy (May 2012)
- NHS Scotland ADTC Refresh Short Life Working Group (October and December 2012)
- NHS Lothian Information Governance Assurance Board Meeting – Caldecott Guardian and CHI
- Healthcare Improvement Scotland Adverse Event reference group meetings (November 2012, December 2012, January 2013). Two elements
  - Review programme of current AE systems within Health Boards across Scotland
  - Draft National framework for reporting AEs going forward produced for consultation across Scotland

- NHS Scotland Directors of Pharmacy
  - Changes to Yellow Card reporting and definition to an ADR
  - Response to HIS AE National framework consultation (December 2012, January 2013)
- NHS Lothian Nursing Action Learning Project on Adverse Events (October 2012, December 2012)

#### NES/ YCC Scotland e-learning modules

- £25K approved by the NES Executive in March 2012 for in-year funding for six modules
- Meeting with NHS Education Scotland (NES) to pursue e-learning modules as a joint initiative (April 2012)
- Tendering and Interviews November 2012. Awarded to Aurion, Belfast.
- Meeting with Aurion to set timeline for deliverables.
- Multiprofessional Stakeholders engagement meeting 29 January 2013
- All modules delivered by March 2013 for build. Launch Autumn 2013 expected.

Monthly dissemination of Dear Healthcare Professional letters summary from the MHRA to key contacts within each health board for onward cascade.

Annual reports for each health board across Scotland on reporting via the Yellow Card Scheme.

## 5.4 Facilitation

### ***Detail development of YCC website***

In October 2012 the redesigned and more user-friendly version of the YCC Scotland website was launched on <http://www.yccscotland.scot.nhs.uk/> with new features including a regular newsfeed, a Google-type search facility and a section specifically for patients and members of the public.

## 5.5 Internal communications

Following discussion at the YCC AGM in January 2013, quarterly teleconferences have been started between the Yellow Card Centres and the MHRA which are proving very helpful in keeping communication links open and progressing developments.

## 6. Publications

Antoine DJ, Jenkins RE, **Dear JW**, Williams DP, McGill MR, Sharpe MR, Simpson KJ, Craig DGN, Jaeschke H. & Park K. Molecular forms of HMGB1 and Keratin-18 as mechanistic biomarkers for mode of cell death and prognosis during clinical acetaminophen hepatotoxicity. *J Hepatol.* 2012; 56(5):1070-79.

Conway BR, Manoharan D, Jenks S, **Dear JW**, McLachlan S, Strachan MW & Price JF. Measuring urinary tubular biomarkers in type 2 diabetes does not add prognostic value beyond established risk factors. *Kidney Int.* 2012; 82(7): 812-818.

**Cuthbert M.** Yellow Card Centre Scotland – Lothian update. *Lothian Prescribing Bulletin* 2012; Issue 58(November):3

**Dear JW**, Street J' & Bailey MA. Urinary exosomes: a reservoir for biomarker discovery and potential mediators of intra-renal signaling. *Proteomics.* Epub 2013 Feb 15. doi: 10.1002/pmic.201200285.

Duncan EM, Francis JJ, Johnston M, Davey P, **Maxwell S**, McKay GA, McLay J, Ross S, Ryan C, Webb DJ, Bond C. Learning curves, taking instructions, and patient safety: using a theoretical domains framework in an interview study to investigate prescribing errors among trainee doctors. *Implementation Science* 2012;**7**:86.

Evan LC, Livingstone DE, Kenyon CJ, Jansen MA, **Dear JW**, Mullins JJ & Bailey MA. A urine-concentrating defect in 11 $\beta$ -Hydroxysteroid Dehydrogenase Type 2 null mice. *Am J Physiol Renal Physiol*. 2012; 303(4): F494-502.

Haffey F, Brady R, **Maxwell S**. Comparison of accuracy and reliability of smartphone apps for opioid conversion. *Drug Safety* 2013;**36**:111–117

**Maxwell S**. An agenda for UK clinical pharmacology: How should teaching of undergraduates in clinical pharmacology and therapeutics be delivered and assessed? *British Journal of Clinical Pharmacology* 2012;**73**:893-899

**Maxwell S**, Mucklow J. e-Learning initiatives to support prescribing. *British Journal of Clinical Pharmacology* 2012;**74**:621-631.

Mucklow J, Bollington L, **Maxwell S**. Assessing prescribing competence. *British Journal of Clinical Pharmacology* 2012;**74**:632-639.

Ross S, **Maxwell S**. Prescribing and the core curriculum for tomorrow's doctors: BPS Curriculum in Clinical Pharmacology and Prescribing for Medical Students. *British Journal of Clinical Pharmacology* 2012;**74**:644-661

Ross S, Ryan C, Duncan EM, Francis JJ, Johnston M, Ker JS, Lee AJ, MacLeod MJ, **Maxwell S**, McKay GA, McLay J, Webb DJ, Bond C. Perceived causes of prescribing errors by junior doctors in hospital inpatients: a study from the PROTECT programme. *BMJ Quality & Safety* 2013;**22**:97-102

Starkey-Lewis P, Merz M, Couttet P, Grenet O, **Dear J**, Antoine D, Goldring C, Park BK, & Moggs JG. Serum microRNA biomarkers for human drug-induced liver injury. *Clinical Pharmacology & Therapeutics*. 2012; 92(3): 291-293.

## 7. Research

An ISAC application was made in March 2012 for Yellow Card reporting data to assess the impact of the Scottish Public Health Campaign via community pharmacies on patient reporting of ADRS, including herbal medicines. This application was subsequently approved and data received. Analysis of this dataset will be progressed.

Appendix 1 – Sources of Yellow Card reports (Scotland) 2002 – 2012/13

Source of Reports Scotland	Reports 2002	Reports 2003	Reports 2004	Reports 2005	Reports 2006-07	Reports 2007-08	Reports 2008-09	Reports 2009-10	Reports 2010-11	Reports 2011-12	Reports 2012-13
Carer					13	8	10	7	5	11	4
Chiropodist											2
Community Pharmacist	63	50	47	43	24	34	49	37	55	33	47
Consumer								2	0	0	0
Dentist		2	4	2	3	3	5	3	1	2	4
GP	544	547	432	440	330	353	373	230	244	181	131
Health Care Assistant											2
Hospital Doctor	396	320	322	334	131	178	213	176	200	159	173
Hospital HCP*					24	77	102	69	61	34	25
Hospital Nurse		22	22	47	10	34	51	61	40	47	73
Hospital Pharmacist	246	354	272	286	165	125	116	98	77	73	86
Medical Student										2	1
Midwife											2
Nurse	39	113	76	217	78	83	240	162	118	122	108
Optometrist					4	2	1	3	0	1	3
Other HCP	81	47	51	44	102	100	114	94	67	97	89
Parent					7	9	15	8	10	16	8
Patient					131	145	138	104	89	98	71
Pharmacist					37	39	25	27	22	8	10
Physician					107	31	25	23	19	21	7
Pre-Reg Pharmacist										6	7
Radiographer										3	2
<b>TOTAL</b>	<b>1369</b>	<b>1455</b>	<b>1226</b>	<b>1413</b>	<b>1166</b>	<b>1222</b>	<b>1477</b>	<b>1104</b>	<b>1008</b>	<b>914</b>	<b>858</b>

\*HCP = Health Care Professional