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Chronic obstructive pulmonary disease in the Abertawe Bro Morgannwg area report IIb: COPD severity, flu vaccination and emergency admissions



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1 Key findings

- COPD severity has been recorded in most (78%) of COPD patients between 1st January 2009 and 31st August 2010. Half of those without a score are patients 'excepted' by the practice from QOF performance reporting.
- Flu vaccination among COPD patients aged under 65
 - Vaccination rates were higher among those with severe dyspnoea (73%) than those with mild dyspnoea (67%); this difference was evident in both males and females.
 - Vaccination rates among men and women were similar (63% and 64% respectively); with rates slightly higher among women with mild or unclassified dyspnoea.
- Flu vaccination among COPD patients aged 65 and over
 - Vaccination rates were lower in those with severe dyspnoea (77%) than those with mild dyspnoea (80%); this difference was evident in both males and females.
 - Vaccination rates among men were higher (78%) than among women (72%). This was seen in patients with mild and severe dyspnoea; however, little difference was seen in those with unclassified dyspnoea.
- Those without a recorded dyspnoea severity are the least likely group to receive vaccination among all age/gender groups.
- Admissions findings
 - Seven per cent of those with COPD (1 in 14) had at least one emergency admission during the winter period. Admissions reached a peak during December.
 - Admissions were higher among those aged 65 and over than younger patients (8.2% vs 4.8%) and higher among those with severe disease than mild disease (9.4% vs 3.0%)
 - Admissions were slightly higher among women than men (7.3% vs 6.8%)
 - Among COPD patients aged 65 and over those where the severity status was unknown were more likely to be admitted than those with severe COPD (11.7% vs 10.1%)
- Implications for practice can be found at the end of this document.

2 Background

During 2011 the Public Health Wales Observatory produced a report entitled '*Chronic obstructive pulmonary disease in the Abertawe Bro Morgannwg area: report 1*'. In order to take this work forward, another report was produced entitled '*Chronic obstructive pulmonary disease in the Abertawe Bro Morgannwg area: Flu vaccination*'. Both reports looked into the patterns of Chronic Obstructive Pulmonary Disease (COPD) in Abertawe Bro Morgannwg University Health Board (ABM UHB), the latter concentrating on vaccine uptake. They were produced to support the activities of community networks within ABM UHB, describing the pattern of COPD amongst patients registered with community network GP practices in the ABM UHB area.

Map of submitting GP Practices in the Abertawe Bro Morgannwg University Health Board area



The previous reports can be accessed via the following link:

http://www.wales.nhs.uk/sitesplus/922/page/49905#Observatory_publications

2.1 Purpose of this paper

This paper is the final in a series investigating COPD patterns amongst ABM UHB patients. This continues the investigation into flu vaccine and patterns amongst COPD diagnosed patients. However, the focus is to provide information on the patterns of flu vaccination and respiratory admissions in relation to the MRC dyspnoea scale (severity score), age and gender.

There are two key objectives which this paper has focussed on, these are to:

1. Examine flu vaccination among COPD patients by age, gender and severity score within ABM UHB.
2. Examine emergency admissions resulting from respiratory disease among COPD patients during the flu period in relation to severity score.

This work is exploratory in nature and seeks to support the ABM UHB community network in delivering care at a local level, although the data are not released at community network level due to small numbers.

3 Definitions

3.1 COPD

The population included in this analysis were all patients with a recorded diagnosis of COPD prior to 1st September 2010, as the project focuses on the flu season from 1st September 2010 to 31st March 2011. It includes those registered to a practice within the ABM area that submits to SAIL. A diagnosis for COPD was defined using the following Read codes within the GP data, to be consistent with the phase IIa work:

- H3...
- H31% (excluding H3101, H31y0, H3122)
- H32%
- H36.. - H3z..

3.2 MRC dyspnoea scale

The severity of COPD was categorised using the MRC dyspnoea scale. Patients were assigned a COPD severity score using the most recent assessment occurring between 1st January 2009 and 31st August 2010 (inclusive), ensuring a complete QOF period is included.

The MRC dyspnoea scale (severity score) grades the degree of breathlessness in relation to activities. Severity scores were defined as follows (with Read codes)¹:

1. Not troubled by breathlessness except on strenuous exercise (173H.)
2. Short of breath when hurrying or walking up a slight hill (173I.)
3. Walks slower than a contemporary on level ground because of breathlessness or has to stop for breath when walking at own pace (173J.)
4. Stops for breath after walking about 100m or after a few minutes on level ground (173K.)
5. Too breathless to leave the house, or breathless when dressing or undressing (173L.)

Following discussions with ABM UHB stakeholders and initial scoping, the severity scores were accrued into two categories; mild (included severity score 1 and 2) and severe (included severity score 3, 4 and 5).

3.3 Flu vaccination

Patients with COPD were identified as having had the flu vaccination if they had one of the following Read codes² during the flu season between 1st September 2010 and 31st March 2011 (inclusive):

- n47% (excluding n47A., n47B., n47r., n47s., n47t.)
- 65E.. – 65E4.
- ZV048

The codes used to identify flu vaccinations were consistent with those used in the Phase IIa work. People that had not been vaccinated were divided into two further groups; not vaccinated and non receipt. Non receipt includes patients that were intolerant, refused or allergic. The codes used to identify non receipt were 8I2F, 9OX5, 14LJ, U60K4, ZV14F². These patients were not included in the analysis.

In some cases, particularly amongst children, more than one course may be given to vaccinate against flu. These patients will not benefit from the full protective effects of vaccination until the entire course is received. Here the first date of vaccination was chosen, this is because the work concentrates on reaching and vaccinating patients rather than the efficacy of the vaccination in relation to severity score, which would require control for confounding factors. To that end, vaccines received in previous years were also not included as protection wanes and the importance of annual vaccination should be highlighted³.

3.4 Exception codes

In certain cases patients can be given an exception code, these relate to patients that, for example, repeatedly miss appointments, have refused treatment or it is deemed no benefit may come from treatment as they may for example be in palliative care. Exception codes would be generated for each QOF period and therefore were included when recorded between 1st January 2009 and 31st August 2010. Patients that had been excepted from QOF reporting were considered in this analysis unless otherwise stated because they had refused or been unable to receive treatment in relation to their condition only rather than because they were not vaccinated.

Patients identified as exceptions are identified using the following Read code²:

- 9h5%

3.5 Emergency hospital admissions

Emergency admissions for this paper were defined as anyone admitted, via the emergency route (admission methods 21-25 or 29 (emergency transfers)) with a primary respiratory diagnosis (ICD 10 code beginning with J) in the admitting episode between 1st September 2009 to 31st March 2010 (inclusive).

Two measures have been used to assess the demand on secondary care from COPD patients. One measure looked at the number of COPD patients that were admitted within the period, by the date of first admission. The other assessed the total number of emergency hospital admissions from COPD patients, used as a proxy to measure the burden on the service and morbidity that required hospitalisation. For both indicators, the denominator is calculated by the number of those registered with a COPD diagnosis prior to the Census date. No adjustment is made for death or transfer out during the period.

4 Results

4.1 COPD and severity score

From the ABMU practices that submit data to the SAIL databank, there were just over 9,500 diagnosed COPD patients identified, this is approximately 87% of COPD registered patients identified by QOF in 2011 for ABMU. In addition the analyses included 86% of all practices in the ABMU area. There were slightly over 2,000 individuals with no recorded severity score (severity not recorded). It is important to note that COPD patients are only included from practices submitting data to the SAIL databank. One additional practice is excluded from the analysis because of incomplete data.

In order to be captured in this analysis a patient's record must include a valid COPD Read code. General practitioners are required to review records when registering new patients to ensure those diagnoses are included; however, it is possible that some patients with a historic diagnosis may not have been identified.

There are over 5,500 people registered to ABMU practices that have a severity score recorded without a COPD diagnosis; of these, over 4,500 have mild severity recorded and just under 1,000 have been recorded as having severe dyspnoea. It is unclear whether this scale is being used to assess conditions other than COPD. To investigate this, the Read codes that were recorded on the same day as the severity score have been captured. In most cases multiple Read codes are captured making it difficult to assess which are the main diagnoses or reason for the consultation.

In addition, Read codes can be used for a variety of reasons other than diagnosis, including risk factors and treatments. The events associated with a high severity score and no COPD diagnoses are similar across the severity groups they include asthma codes, Peak Expiratory Flow Rate (PEFR), home oxygen supply cylinders and certain lifestyle factors such as BMI and smoking status.

Excepted Patients

Table 1

COPD Patients with excepted status, by severity scale, persons, all ages

COPD exception	Severity not recorded	Mild	Severe	Total
Yes	1025	228	434	1687
No	1041	3100	3692	7833
Total	2066	3328	4126	9520
Proportion excepted	49.6	6.9	10.5	17.7

Produced by Public Health Wales Observatory using GP data via the SAIL databank

The exception status in table 1 shows that almost half of COPD patients without a recorded severity have been assigned an exception code.

Twenty one percent of COPD patients don't have a recorded severity; almost half of these patients have been excepted from QOF performance reporting.

4.2 Flu vaccination

There were 6,774 patients with COPD that received a vaccination. There were approximately twenty individuals that didn't receive a vaccine because they were intolerant, refused or allergic (non receipt); these patients have been excluded from the analysis.

Vaccinated patients

Table 2

COPD patients by vaccination status and severity scale, persons, aged under 65 (excluding patients that have refused/reacted to a vaccination)

Patient vaccinated	Severity not recorded	Mild	Severe	Total
Yes	336	860	822	2018
No	411	427	310	1148
Total	747	1287	1132	3166
Proportion vaccinated	45.0	66.8	72.6	63.7

Produced by Public Health Wales Observatory using GP data via the SAIL databank

Table 2 shows the number of people aged under 65, with a COPD diagnosis, by vaccination status and severity score. It suggests that in ABM UHB over half of those with a COPD diagnosis are vaccinated and that higher proportions can be found with greater severity score.

Table 3

**COPD patients by vaccination status and severity scale, persons, aged 65 and over
(excluding patients that have refused/reacted to a vaccination)**

Patient vaccinated	Severity not recorded	Mild	Severe	Total
Yes	822	1626	2308	4756
No	494	411	675	1580
Total	1316	2037	2983	6336
Proportion vaccinated	62.5	79.8	77.4	75.1

Produced by Public Health Wales Observatory using GP data via the SAIL databank

Table 3 shows the number of people aged 65 years and over, with a COPD diagnosis, by vaccination status and severity scale. The slight difference between the proportion vaccinated amongst mild and severe may reflect the difficulty in managing those with severe COPD; older patients with more severe disease may find it increasingly difficult to access primary care services.

Vaccination uptake amongst males

Table 4

**COPD patients by vaccination status and severity scale, males, aged under 65
(excluding patients that have refused/reacted to a vaccination)**

Patient vaccinated	Severity not recorded	Mild	Severe	Total
Yes	164	446	398	1008
No	213	226	149	588
Total	377	672	547	1596
Proportion vaccinated	43.5	66.4	72.8	63.2

Produced by Public Health Wales Observatory using GP data via the SAIL databank

Table 5

**COPD patients by vaccination status and severity scale, males, aged 65 and over
(excluding patients that have refused/reacted to a vaccination)**

Patient vaccinated	Severity not recorded	Mild	Severe	Total
Yes	390	962	1280	2632
No	237	195	316	748
Total	627	1157	1596	3380
Proportion vaccinated	62.2	83.1	80.2	77.9

Produced by Public Health Wales Observatory using GP data via the SAIL databank

Tables 4 and 5 show the number of males aged under 65 years and aged 65 years and over, with a COPD diagnosis, by vaccination status and severity score. Table 4 indicates that on average just over 60% of males aged under 65 and diagnosed with COPD are vaccinated and that the proportion increases with severity, although it remains low in the most severe group, with more than a quarter not receiving the vaccine. Table 5 shows that higher proportions of males are vaccinated in the 65 and over age group and that vaccination levels are particularly high amongst the mild severity group.

Vaccination uptake amongst females

Table 6

**COPD patients by vaccination status and severity scale, females, aged under 65
(excluding patients that have refused/reacted to a vaccination)**

Patient vaccinated	Severity not recorded	Mild	Severe	Total
Yes	172	414	424	1010
No	198	201	161	560
Total	370	615	585	1570
Proportion vaccinated	46.5	67.3	72.5	64.3

Produced by Public Health Wales Observatory using GP data via the SAIL databank

Table 7

**COPD patients by vaccination status and severity scale, females, aged 65 and over
(excluding patients that have refused/reacted to a vaccination)**

Patient vaccinated	Severity not recorded	Mild	Severe	Total
Yes	432	664	1028	2124
No	257	216	359	832
Total	689	880	1387	2956
Proportion vaccinated	62.7	75.5	74.1	71.9

Produced by Public Health Wales Observatory using GP data via the SAIL databank

Tables 6 and 7 show the number of females aged under 65 years and 65 years and over, with a COPD diagnosis, by vaccination status and severity score. Patients aged under 65 have a similar pattern to males in the same age group. Table 7 shows that around two thirds of females aged 65 and over, without a severity score, receive a vaccination. Vaccination uptake in this group is similar to the male equivalent. However, vaccinations in the mild and severe groups are lower than the male equivalent.

4.3 Emergency respiratory admissions

Chart 1

Cumulative respiratory emergency hospital admission rate per 100,000 COPD patients, by severity, persons, aged under 65: Admissions between 1st Sept 2010 and 31st March 2011

Produced by the Public Health Wales Observatory using GP data, PEDW via the SAIL databank

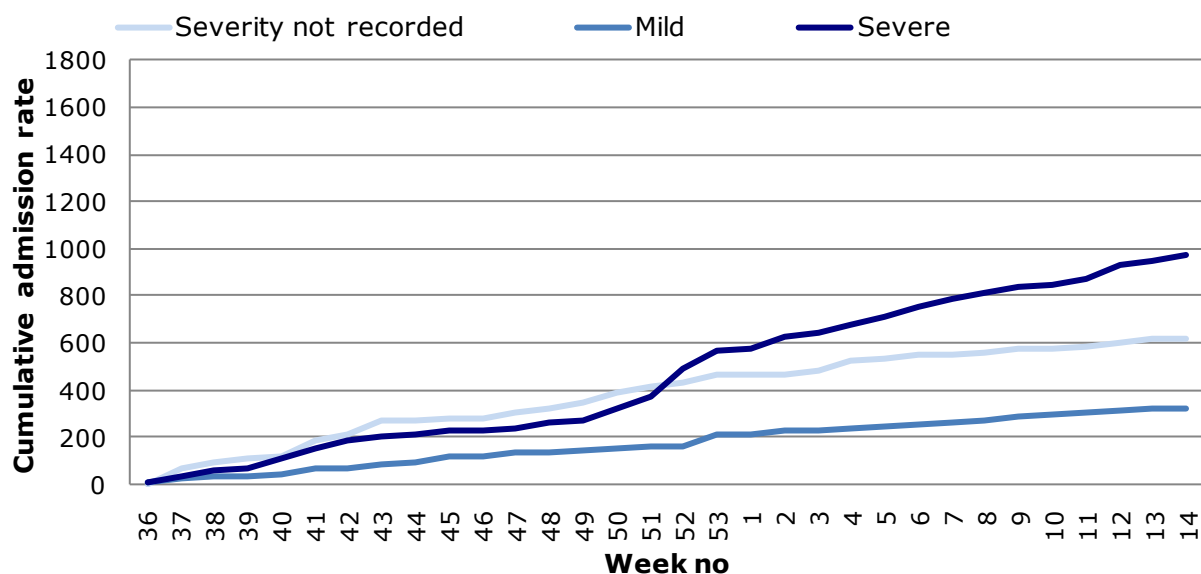
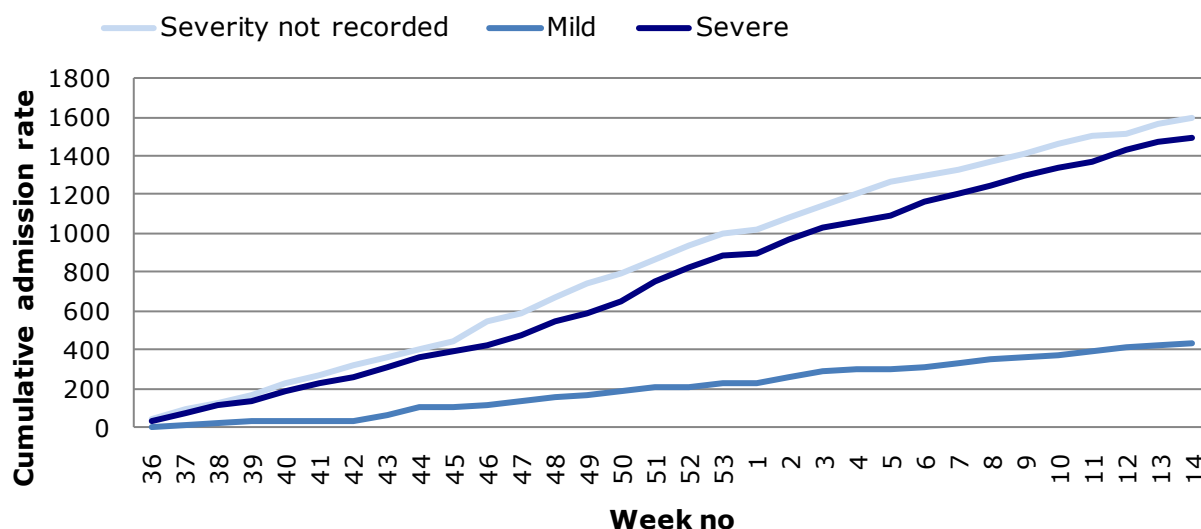


Chart 2

Cumulative respiratory emergency hospital admission rate per 100,000 COPD patients, by severity, persons, aged 65 and over: Admissions between 1st Sept 2010 and 31st March 2011

Produced by the Public Health Wales Observatory using GP data, PEDW via the SAIL databank



Charts 1 and 2 represent the cumulative respiratory emergency admission rate per 100,000 COPD patients by severity score during the flu season 1st September 2010 to 31st March 2011 by age, grouped into under 65 and those aged 65 years and over. The cumulative admission rate is based on the number of hospital admissions from COPD patients in each severity category and can include multiple admissions from the same person. The majority (93%) of diagnosed COPD patients were not admitted during the season.

Patients with COPD aged 65 and over have the highest rate of emergency admissions across the severity groups. Patients aged 65 years and over have a similar pattern amongst the severe and no recorded severity groups. However, if the patients with a COPD exception code were removed from the analysis, the rate of emergency respiratory hospital admissions in the no recorded severity group is reduced from 1,600 to 1,100 per 100,000 patients at the end (31st March) of the period. Of patients with no recorded severity, 27% of emergency admissions were readmissions; this is similar in the mild group at 26%. The greatest proportion of readmissions is from patients with severe COPD at 33%.

In the under 65 year old age group, patients with severe COPD had the highest rate of emergency respiratory admissions. As with those aged 65 and over, those with no recorded severity have a higher rate of admissions than COPD patients with mild severity. In the no recorded severity group, by removing patients with a COPD exception code the rate of admissions is reduced from 600 per 100,000 to 300 per 100,000 COPD patients. In this age group patients with no recorded severity had the greatest proportion of readmissions at 37%. Patients with mild and severe COPD had similar readmission rates at 19% and 21% respectively.

Chart 3**First respiratory emergency admissions, crude rates per 100,000 COPD patients, by severity of COPD, Sept 2010 - March 2011, persons, all ages**

Produced by Public Health Wales Observatory, using GP data via the SAIL databank

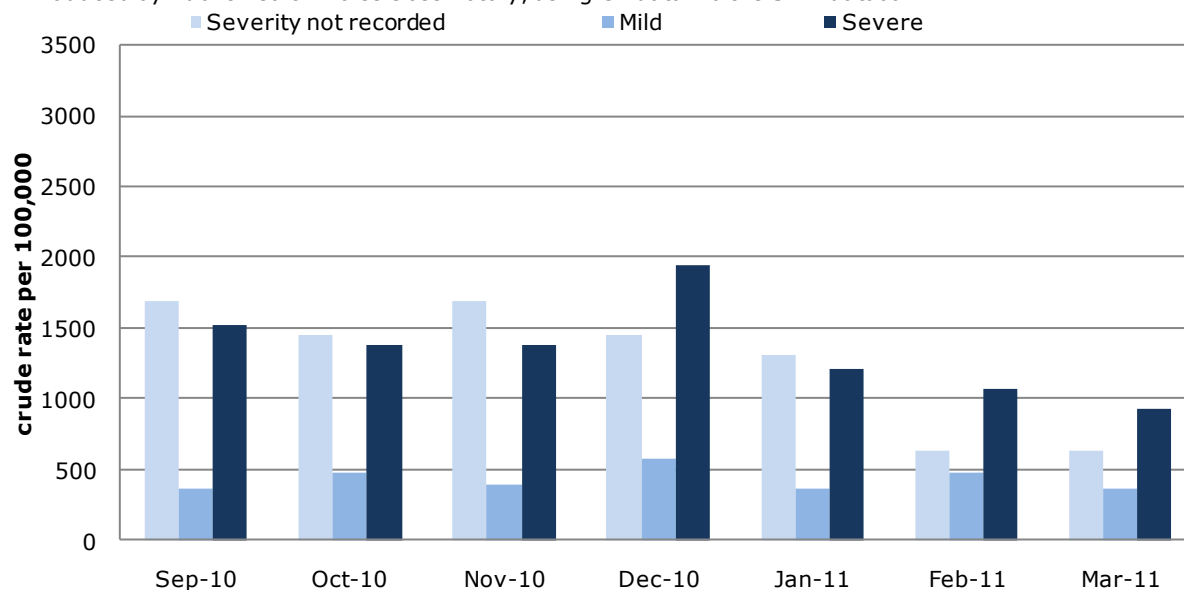


Chart 3 represents first respiratory emergency admissions as a crude rate per 100,000 COPD patients by severity score, per month. This chart suggests that COPD patients that have no recorded severity are more likely to be admitted to hospital than those identified as mild severity and in some months are as likely as or more likely to be admitted than those with high severity.

Chart 4

All respiratory emergency admissions, crude rate per 100,000 COPD patients, by severity of COPD, Sept 2010 - March 2011, persons, all ages

Produced by Public Health Wales Observatory using GP data, PEDW via the SAIL databank

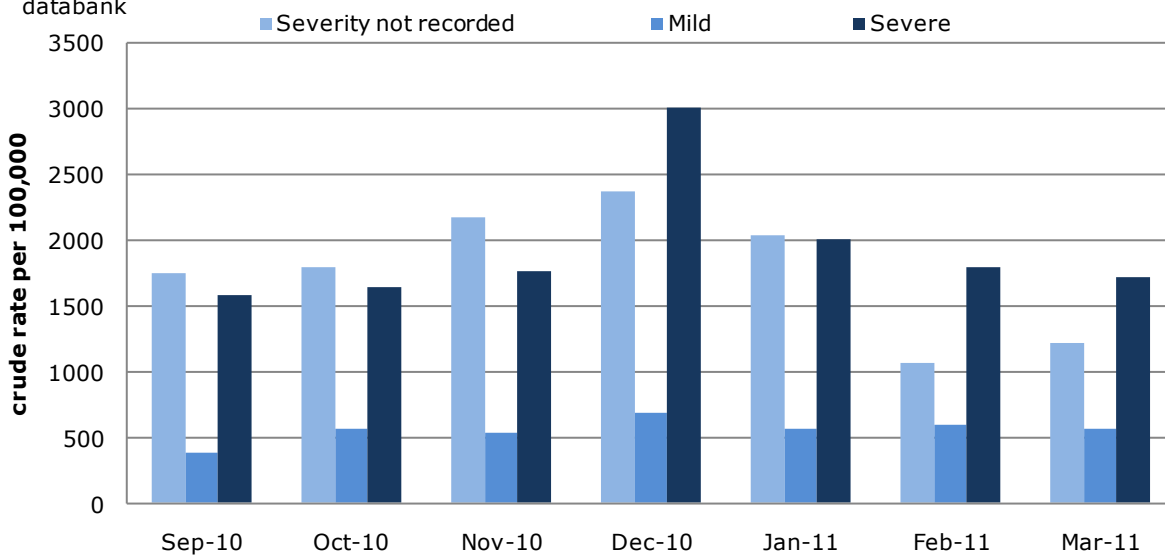


Chart 5

Clinical consultation rate per 100,000 practice population in Welsh sentinel practices (as at 1/10/2012)

Produced by Public Health Wales Observatory using data provided by Public Health Wales Communicable Disease Surveillance Centre, Sentinel GP Surveillance of Infections in Wales

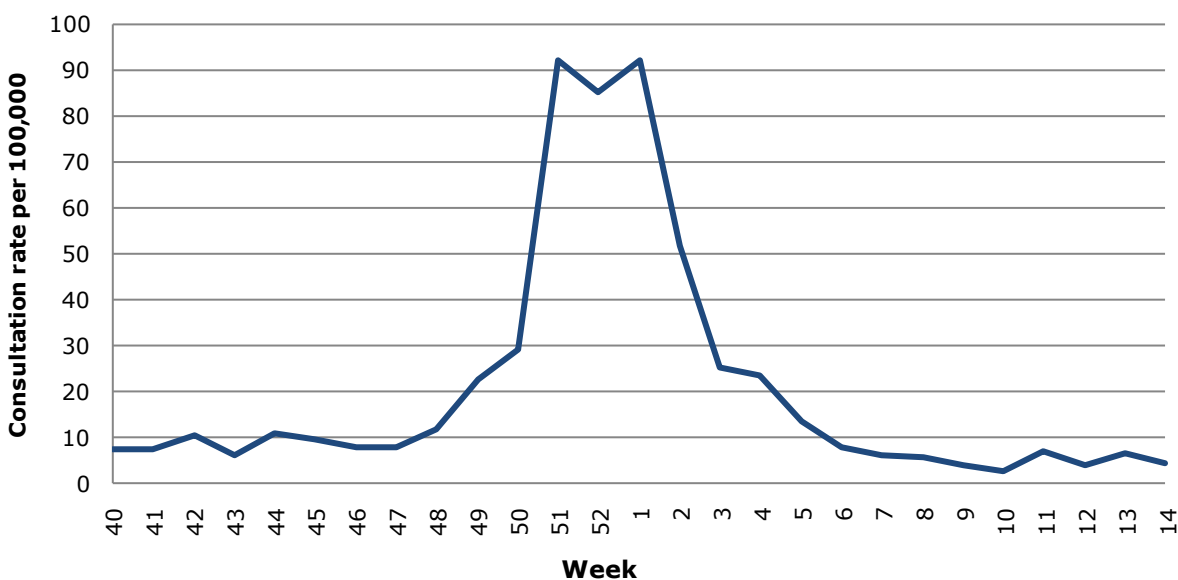


Chart 4 represents all admissions as a crude rate per 100,000 COPD patients within the severity score. This chart suggests that COPD patients without a recorded severity are more likely to be admitted to hospital than those identified in the severe group within the first three months of the flu season and those with mild severity for the entire period.

Chart 5 shows the clinical consultation rate for influenza and is typical of normal seasonal activity albeit that this season was comparatively severe in comparisons to recent years, although not at the levels seen during 1999-2000. Both chart 4 and 5 show a peak occurring in December; for admissions this is particularly seen in the severe COPD group.

Proportion of persons admitted (patients counted once in period)

Table 8

COPD patients by admission status and severity scale, persons, aged under 65

Emergency admission	Severity not recorded	Mild	Severe	Total
Yes	29	34	88	151
No	719	1255	1048	3022
Total	748	1289	1136	3173
Proportion admitted	3.9	2.6	7.7	4.8

Produced by Public Health Wales Observatory using GP data, PEDW via the SAIL databank

Table 9

COPD patients by admission status and severity scale, persons, aged 65 and over

Emergency admission	Severity not recorded	Mild	Severe	Total
Yes	154	66	301	521
No	1164	1973	2689	5826
Total	1318	2039	2990	6347
Proportion admitted	11.7	3.2	10.1	8.2

Produced by Public Health Wales Observatory using GP data, PEDW via the SAIL databank

Tables 8 and 9 contain the number and proportion of COPD patients aged under 65 and 65 and over that are admitted to hospital between September 2010 and March 2011. In this analysis patients are only counted once in the period.

The proportion of all COPD patients that are admitted to hospital at least once in the period is 4.8% for patients aged under 65 and 8.2% for those aged 65 and over. In both age groups the greatest numbers of emergency hospital admissions is amongst the severe group, however, the no recorded severity has the highest proportion amongst the 65+ age group.

*Proportion of males admitted (patients counted once in period)***Table 10****COPD patients by admission status and severity scale, males, aged under 65**

Emergency admission	Severity not recorded	Mild	Severe	Total
Yes	9	16	41	66
No	369	657	508	1534
Total	378	673	549	1600
Proportion admitted	2.4	2.4	7.5	4.1

Produced by Public Health Wales Observatory using GP data, PEDW via the SAIL databank

Table 11**COPD patients by admission status and severity scale, males, aged 65 and over**

Emergency admission	Severity not recorded	Mild	Severe	Total
Yes	68	37	168	273
No	559	1120	1432	3111
Total	627	1157	1600	3384
Proportion admitted	10.8	3.2	10.5	8.1

Produced by Public Health Wales Observatory using GP data, PEDW via the SAIL databank

Tables 10 and 11 show in males with severe dyspnoea the proportion of patients admitted increases from 7.5% in those aged under 65 to 10.5% in those aged 65 and over. In the 65 years and over group, more hospital admissions come from those with no recorded severity than those with mild severity.

*Proportion of females admitted (patients counted once in period)***Table 12****COPD patients by admission status and severity scale, females, aged under 65**

Emergency admission	Severity not recorded	Mild	Severe	Total
Yes	20	18	47	85
No	350	598	540	1488
Total	370	616	587	1573
Proportion admitted	5.4	2.9	8.0	5.4

Produced by Public Health Wales Observatory using GP data, PEDW via the SAIL databank

Table 13**COPD patients by admission status and severity scale, females, aged 65 and over**

Emergency admission	Severity not recorded	Mild	Severe	Total
Yes	86	29	133	248
No	605	853	1257	2715
Total	691	882	1390	2963
Proportion admitted	12.4	3.3	9.6	8.4

Produced by Public Health Wales Observatory using GP data, PEDW via the SAIL databank

Tables 12 and 13 suggest that the pattern of hospital admissions between the two age groups in females is similar to that of the males; the number of admissions in all severity groups is higher in the 65+ age group. As with males, there is a large increase in the proportion of admissions from those without a recorded severity in the older age group.

5 Discussion

5.1 Vaccinations

The Welsh Government set a target immunisation uptake of 75% for the recommended at risk groups for the 2010/11 season, this is in line with the World Health Organization (WHO) target⁴. These include the population aged 65 and over as well as those diagnosed with COPD. The target has been partially achieved here; those not scored using the MRC dyspnoea scale are less likely to be vaccinated, whereas there is variation across mild and severe groups in vaccine uptake depending to some extent on age and sex.

In both males and females aged under 65 the proportion of people receiving a vaccination increases with severity. Females with no recorded severity or with a mild severity have a higher proportion of vaccination than in males. This is consistent with the theory that females are more pro-active at accessing preventative services. However, in the most severe group a slightly higher proportion of males are vaccinated.

As expected the proportion of COPD patients that are vaccinated is higher in those aged 65 and over, this is true for males and females. This might suggest that GP practices are more actively managing older COPD patients or that older patients are more accepting of having the vaccine. Unlike those aged under 65, a higher proportion of males are vaccinated than females with the exception of those without a severity score, where the proportions are very similar.

Males and females aged 65 and over with the highest level of severity have a lower proportion of vaccinations than those with mild severity; however, the proportion is lowest among those without a severity recorded. Anecdotally it is thought that those with the highest level of severity find it more difficult to access primary care services and are therefore less likely to receive a vaccination. This could be an illustration of the difficulties in engaging patients with severe COPD as they are likely to be too breathless to leave their place of residence. When interpreting the results consideration should also be given to those patients vaccinated in other settings such as pharmacies and community nurses which would not have been captured in this analysis.

5.2 Respiratory emergency hospital admissions

Amongst those aged 65 and over, the admission rate in patients with no recorded severity is higher than patients in both the mild and severe dyspnoea groups. Patients with a COPD exception code make up a large proportion of the hospital admissions.

When considering the overall number of hospital admissions, a higher proportion of hospital admissions occur in the colder months, such as December and January, in all severity groups. The greatest number of hospital admissions came from those in the most severe group and this might be a reflection of the poorer state of health of patients with this level of severity, more frequent monitoring or a better awareness of exacerbations.

Patients with no recorded severity at the start of the vaccination period appear to be the most likely to be admitted to hospital and they are also the most likely not to have received the flu vaccine. The reasons for this are complex and multi factorial however; one explanation for this might be that some of those whose COPD is severe find it difficult to access services, making them less likely to have a recorded severity.

6 Conclusions

The MRC dyspnoea scale is widely used for COPD patients, with 80% of patients having a recorded dyspnoea score (within the previous twenty months). The large number of severity scores in the absence of a clear diagnostic code may suggest a need to examine coding further.

In relation to vaccination:

- Older patients (65 and over) are more likely to be vaccinated than younger patients
- Older patients with more severe COPD are less likely to be vaccinated than those with milder COPD; the reverse is true for younger patients
- Women are less likely to be vaccinated than men
- Reasons as to why someone is vaccinated or not may relate to both individual factors and practice factors

In relation to admissions:

- As expected, admissions are higher in older patients with more severe disease; however, being over 65 had much less impact on admissions rate than having severe disease
- Those with no recorded severity were the most likely to be admitted among the older age group; the reasons for this may relate to how these individuals access services
- Women are more likely to be admitted than men

Those with no recorded severity have distinct characteristics including:

- A high proportion excepted for QOF (50%, vs. 7% among those with mild COPD and 11% among those with severe COPD)
- Low vaccination rates (45% in the under 65s; 63% in those aged 65 and over)
- The highest admission rates among the older age group (65 and over), at 11.7%, compared to 3.2% and 10.1% for mild and severe COPD respectively

Lack of severity scoring might suggest a lower degree of interaction with the practice; if this were the case it may have wider implications for the management of this group of patients, particularly among those aged 65 and over. Reasons may include severity of disease, frailty, patient choice or factors associated with the practice and how services are delivered.

7 Implications for practice

- There should be attention on those patients who have not had an MRC dyspnoea score recorded, to understand why there is no score in place and seek opportunities for more pro-active management, including, but not restricted to, vaccination uptake.
- Consider how to maximise immunisation coverage particularly in
 - younger people who have chronic conditions and
 - older individuals with more severe disease
- When counselling individual patients consider:
 - Women were less likely to take up the vaccine, but were also the group at highest risk of admission
 - Younger individuals were less likely to take up vaccination; however, admission rates among those categorised either as mild or severe COPD were not dissimilar to those >65 years
- Consider coding issues, including use of exception codes; assignment of COPD codes; and use of dyspnoea scale in conditions other than COPD.

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