

# Respiratory Prescribing Analysis with Cluster Level Comparators

**This resource has been retired (January 2025)**

This resource has been retired and is no longer considered an AWMSG-endorsed resource.

The resource underwent an assessment for review in June 2024. At that time members of the All Wales Prescribing Advisory Group (AWPAG) considered it appropriate to retire the resource.

The content contained within the resource was considered to be out of date and, without an indication that an updated version of the resource would be of significant benefit to NHS Wales, AWPAG members considered it most appropriate for the resource to be retired at this time.

If you think this resource should be reconsidered for review, please get in touch with AWTTTC by emailing [AWTTTC@wales.nhs.uk](mailto:AWTTTC@wales.nhs.uk).

This report has been prepared by the Welsh Analytical Prescribing Support Unit (WAPSU), part of the All Wales Therapeutics and Toxicology Centre (AWTTC), with support from the All Wales Prescribing Advisory Group (AWPAG), and has subsequently been endorsed by the All Wales Medicines Strategy Group (AWMSG).

**This resource has now been retired and is no longer considered an AWMSG endorsed resource.**

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## SUMMARY

- The total cost of prescribing for respiratory medicine in NHS Wales primary care from July 2013–June 2014 was £85,430,162 (5,531,434 items).
- ICS account for 65% of the cost (£55,308,921) and 30% of total items (1,636,928 items) for the year July 2013–June 2014, followed by bronchodilators, which make up 28% of total cost (£23,580,364) and 44% of items (2,418,766 items), due to a lower cost per item for bronchodilators.
- The prevalence of smoking correlates significantly with the prescribing of high-strength ICS for items, DDDs and cost per 1,000 PUs ( $r = 0.74$ ,  $p = 0.01$ ;  $r = 0.66$ ,  $p = 0.04$ ; and  $r = 0.66$ ,  $p = 0.04$ , respectively). However, there is also a strong correlation between smoking and COPD prevalence within Wales ( $r = 0.74$ ,  $p = 0.02$ ).
- The Local Comparator for 2014–2015 and proposed NPI for 2015–2016 have the aim of reviewing the use of ICS routinely in people with asthma, particularly those on high doses, encouraging the step down of the dose when clinically appropriate.
- There appears to be no correlation between emergency admission rates and the use of high-strength ICS. For instance, health boards with higher high-strength ICS usage do not have lower rates of emergency respiratory admissions or other asthma- and COPD-related admissions.
- There is variation between the health boards in the relationship between COPD and asthma outcomes, measured using healthcare resource groups (HRGs), and the prescribing of high-strength ICS. The HRGs are standard groupings of clinically similar treatments, which use common levels of healthcare resource and are used in the document to measure respiratory outcomes.
- To make realistic comparisons of prescribing between Wales and England, between the health boards and between the 64 established GP clusters in Wales, consideration of confounding factors is essential. WAPSU has developed cluster comparators based on disease prevalence and socio-economic variables, in order to appropriately benchmark prescribing data and influence prescribing behaviour accordingly.

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## 1.0 INTRODUCTION

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Respiratory illness has a significant impact on the population of Wales, with asthma prevalence of 6.9% and chronic obstructive pulmonary disease (COPD) prevalence of 2.2%. Respiratory medicines therefore represent a substantial cost to NHS Wales (£85,430,162 between July 2013 and June 2014). Changes to the evidence base suggest that there is the potential for significant improvements in prescribing, which could lead to improved outcomes and cost savings in NHS Wales.

This paper provides an analysis of primary care prescribing in Wales and England for medicines and preparations within the respiratory therapeutic area for the period July 2013–June 2014. The report contains information specific to Wales and its health boards, and also data for England and North East (NE) England for comparative purposes. NE England is used as a comparator for Wales due to its similar demographic profile.

It has been proposed that inhaled corticosteroids (ICS) are monitored as a National Prescribing Indicator (NPI) for 2015–2016. Their inclusion as an NPI would aim to encourage the routine review of ICS in people with asthma, particularly those on high doses, encouraging the step down of the dose when clinically appropriate. High-strength ICS are currently monitored as a Local Comparator.

This report highlights:

- British National Formulary (BNF) respiratory chapter subgroups and medicine classes that make up the majority of cost and items per 1,000 PUs or patients;
- Increasing or decreasing prescribing trends in cost and items per 1,000 PUs and patients;
- Variation in prescribing trends between health boards;
- Variation in prescribing trends between Wales, England and NE England;
- Possible explanations for variation in prescribing trends including:
  - Demographic and disease prevalence data
  - Work carried out locally by health boards
  - Outcomes data
- Respiratory prescribing data for GP cluster groups in Wales presented in eight groups of the most similar clusters based on respiratory disease prevalence and deprivation. This method for presenting data should enable GP cluster groups and health boards to make meaningful comparisons of their prescribing rates with areas of a similar disease prevalence and deprivation profile.

## 2.0 CURRENT RESPIRATORY GUIDANCE

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- The British Thoracic Society/Scottish Intercollegiate Guidelines Network *British guideline on the management of asthma* recommends that the dose of an inhaled corticosteroid (ICS) should be titrated to the lowest dose at which effective control of asthma is maintained<sup>1</sup>.
- The Medicines and Healthcare Products Regulatory Agency (MHRA) advises that the prolonged use of high doses of ICS carries a risk of systemic side effects (e.g., adrenal suppression or crisis, growth retardation in children and young people, decrease in bone mineral density, cataracts and glaucoma)<sup>2</sup> and a range of psychological or behavioural effects (e.g., psychomotor hyperactivity, sleep disorders, anxiety, depression and aggression)<sup>3</sup>.
- When starting patients on a combination of an ICS and a long-acting beta<sub>2</sub> agonist (LABA), it is important to ensure that the appropriate strength of ICS is chosen.

### 2.1 Asthma

- Prescribe inhalers only after patients have received training in the use of the device and have demonstrated satisfactory technique<sup>1</sup>.
- Before initiating a new drug therapy, practitioners should check adherence with existing therapies, inhaler technique and trigger factors<sup>1</sup>.
- Anyone prescribed more than one short-acting bronchodilator inhaler device per month should be identified and have their asthma assessed urgently, and measures should be taken to improve asthma control if this is poor<sup>1</sup>.
- Combination ICS and LABA inhalers are recommended to guarantee that the LABA is not taken without the ICS and to improve adherence<sup>1</sup>.
- It is good practice to audit the percentage of patients reviewed annually. Consider focusing on particular groups such as those overusing bronchodilators, patients on higher treatment steps and those with a history of asthma attacks or complex needs<sup>1</sup>.
- Pharmacists have opportunities to provide education for people with asthma and may be able to identify those with poor control, and improve inhaler technique<sup>1</sup>.

### 2.2 Chronic obstructive pulmonary disease

- All chronic obstructive pulmonary disease (COPD) patients still smoking should be encouraged to stop, and offered help to do so. An up-to-date smoking history, including pack years, should be documented for everyone with COPD. Unless contraindicated, nicotine replacement therapy, varenicline or bupropion should be offered combined with the appropriate support programme to optimise smoking quit rates<sup>4</sup>.
- The choice of medicine(s) should take into account the person's symptomatic response and preference, the medicine's potential to reduce exacerbations, its side effects and cost<sup>4</sup>.

### 3.0 RESPIRATORY PRESCRIBING DATA

This data compares respiratory prescribing for health boards, with Wales, England and NE England, during the period July 2013–June 2014.

#### 3.1 Total respiratory prescribing

The total cost of prescribing for respiratory medicine in NHS Wales primary care from July 2013–June 2014 was £85,430,162 (5,531,434 items). Figures 1 and 2 show the breakdown of respiratory products for Welsh health boards, and for Wales, England and NE England. This includes prescribing of products used for asthma, COPD and allergic disorders, as well as cough preparations, mucolytics and nasal decongestants.

For NHS Wales primary care respiratory prescribing, ICS account for 65% of the cost (£55,308,921) and 30% of total items (1,636,928 items) for the year July 2013–June 2014, followed by bronchodilators, which make up 28% of total cost (£23,580,364) and 44% of items (2,418,766 items), due to a lower cost per item for bronchodilators.

Prescriptions for allergic disorders (including antihistamines and epinephrine), sodium cromoglicate and leukotriene receptor antagonists, mucolytics, cough preparations, aromatic inhalers and systemic nasal decongestants make up 8% of the total cost and 27% of total items for respiratory products.

**Figure 1. Respiratory breakdown. Cost per 1,000 PUs  
July 2013–June 2014**

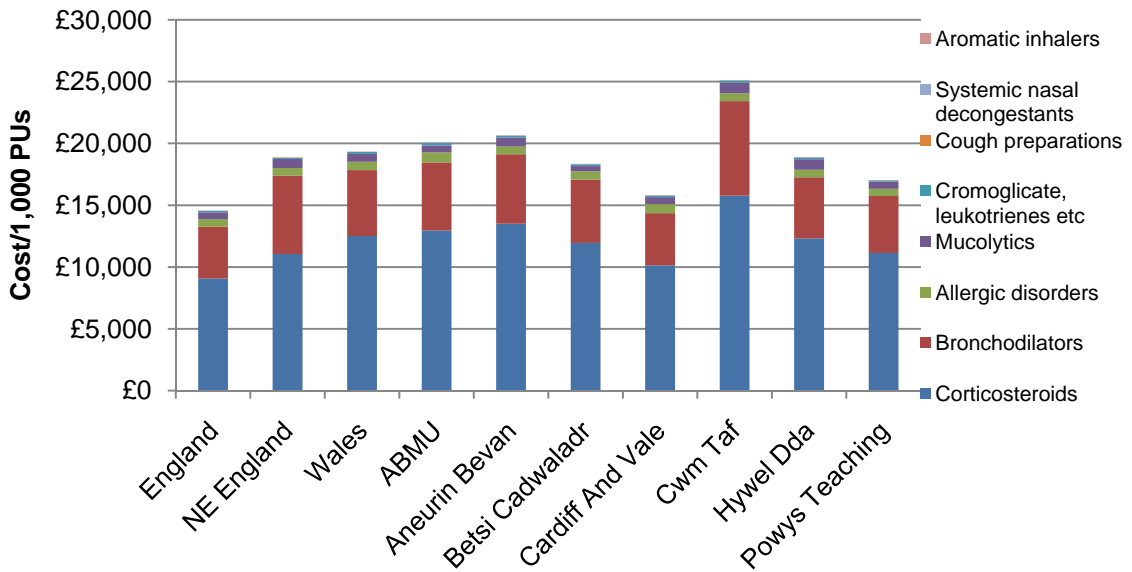
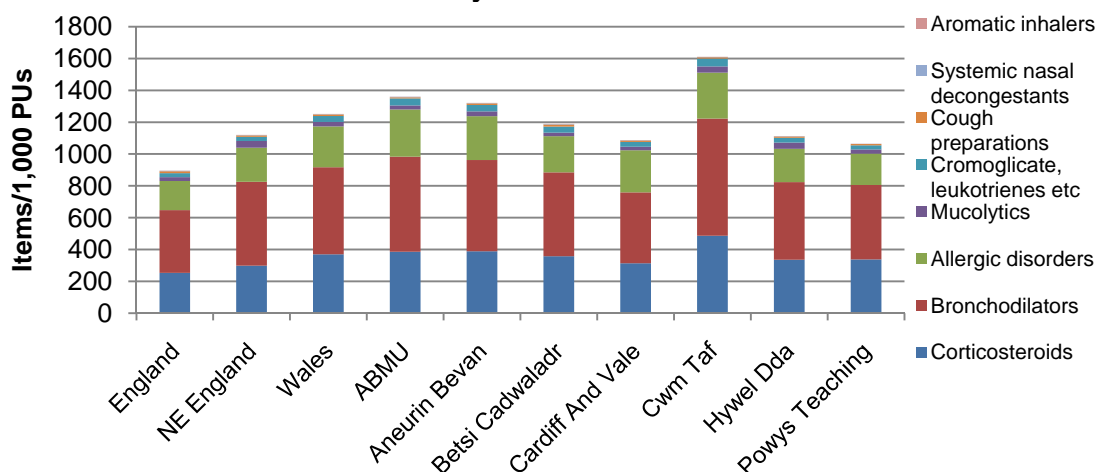


Figure 2. Respiratory breakdown. Items per 1,000 PUs  
July 2013–June 2014



Cwm Taf Health Board has the highest cost and items per 1,000 PUs for respiratory products prescribed, followed by Abertawe Bro Morgannwg University Health Board and Aneurin Bevan Health Board, which may in part be explained by the higher prevalence of COPD seen in Cwm Taf Health Board and the relatively high asthma prevalence seen in Abertawe Bro Morgannwg University Health Board (see Table 1)<sup>5</sup>. However, it must be noted that asthma prevalence is lower in Cwm Taf Health Board than the national average, at 6.5% compared to 6.9%. Smoking prevalence is also higher in Cwm Taf Health Board than the national average, and deprivation is higher in Cwm Taf Health Board, Aneurin Bevan Health Board and Abertawe Bro Morgannwg University Health Board than the national average (see Table 1).

Combined smoking rates from the 2009 and 2010 Welsh health surveys showed adult smoking rates were highest in the South Wales Valleys areas of Blaenau Gwent and Rhondda Cynon Taf, which are also areas with relatively high deprivation. The variation between levels of smoking across Wales is a contributor to health inequalities<sup>6</sup>.

Table 1. Respiratory disease prevalence, proportion of people who smoke and deprivation 2013 (percentage of population)<sup>5-11</sup>

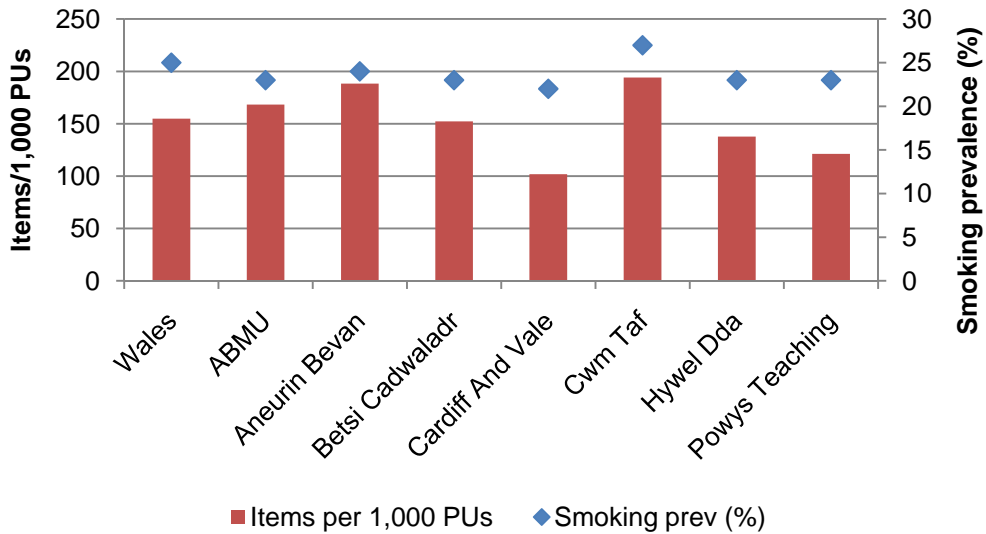
	ABMU	Aneurin Bevan	BCU	Cardiff & Vale	Cwm Taf	Hywel Dda	Powys	Wales	England	NE England
Asthma (%)	7.4	6.9	7.1	6.6	6.5	6.9	6.8	6.9	5.9	6.3
COPD (%)	2.1	2.1	2.5	1.5	2.7	2.1	2.2	2.2	1.8	2.3
Adults smoking daily or occasionally (%) <sup>*</sup>	23	24	23	22	27	23	23	25	20	21
% in most deprived 5 <sup>th</sup> * <sup>†</sup>	26.7	24.1	12.7	23.5	35.5	8.1	1.7	20	20.3	32.4

\* It should be noted that smoking prevalence varies from source to source and year to year depending on how it is measured. Surveys rely on people being honest about their habits and QOF data would be recorded by the GP, e.g. Welsh prevalence rates vary from 25% from the 2010 ONS general lifestyle survey to 20% from the Welsh Government Welsh health survey.

† It should be noted that the Welsh and English Indices of Multiple Deprivation are calculated slightly differently and this should be taken into account when making comparisons.

Figure 3 shows smoking prevalence against prescribing of high-strength ICS, as items per 1,000 PUs for the health boards in Wales for the year July 2013–June 2014. The prevalence of smoking correlates significantly with the prescribing of high-strength ICS for items, DDDs and cost per 1,000 PUs ( $r = 0.74$ ,  $p = 0.01$ ;  $r = 0.66$ ,  $p = 0.04$ ; and  $r = 0.66$ ,  $p = 0.04$ , respectively). However, there is also a strong correlation between smoking and COPD prevalence within Wales ( $r = 0.74$ ,  $p = 0.02$ ), which helps to illustrate the complexity of the relationship between prescribing data and other factors that may affect respiratory health and outcomes.

**Figure 3. Comparison of high-strength ICS prescribing (items per 1,000 PUs) and percentage of adults who smoke daily or occasionally**



PREVIEW

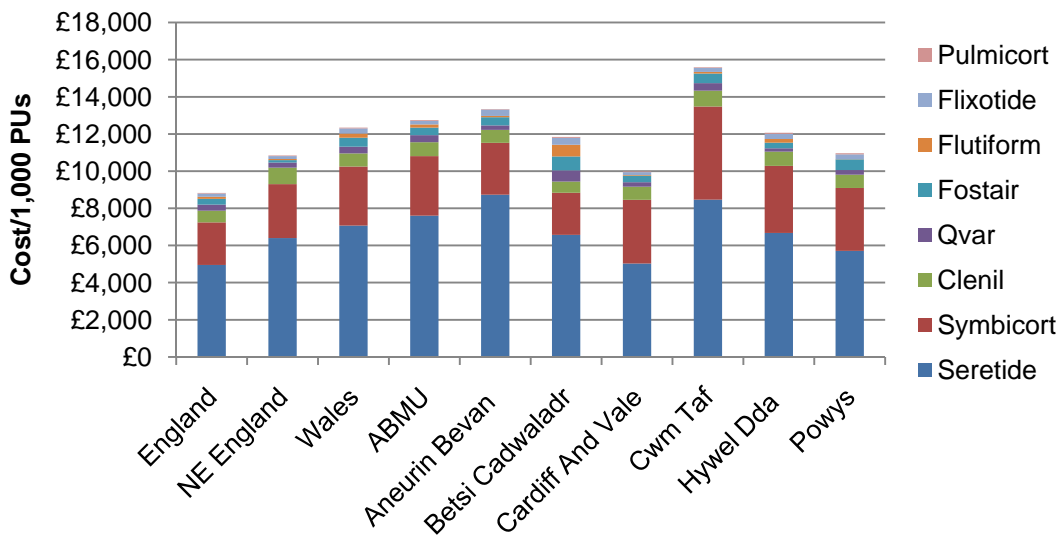
### 3.2 Inhaled corticosteroids

ICS make up the majority of the cost of respiratory products: £55,308,921 for 1,636,928 items for the period July 2013–June 2014.

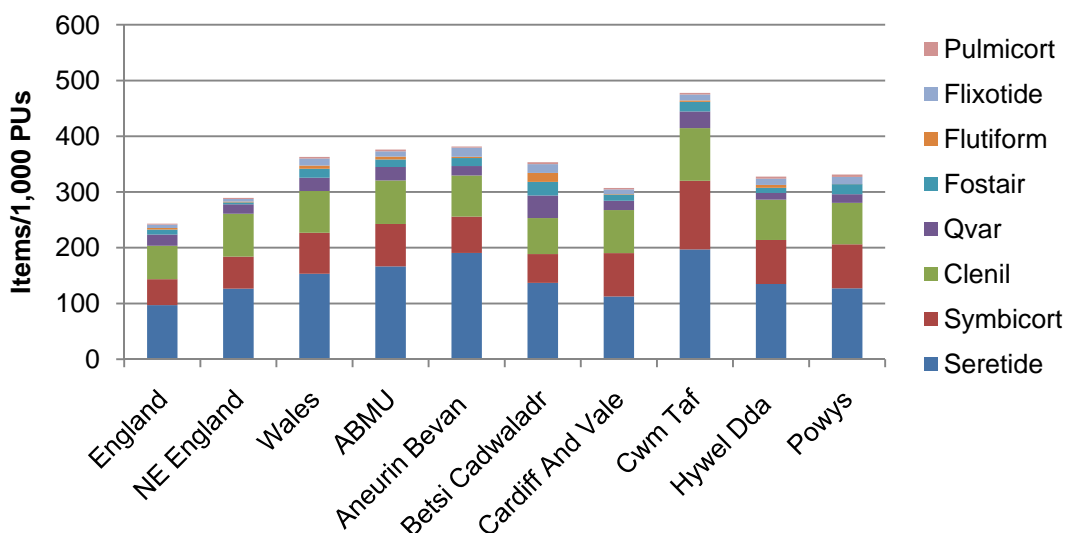
The most commonly prescribed ICS items include Qvar<sup>®</sup>, Clenil Modulite<sup>®</sup>, Pulmicort<sup>®</sup> and Flixotide<sup>®</sup> and some combination products combining an ICS with a long-acting beta<sub>2</sub> agonist (LABA) such as Seretide<sup>®</sup>, Flutiform<sup>®</sup>, Symbicort<sup>®</sup> and Fostair<sup>®</sup>. The majority of the cost and items is made up of Seretide<sup>®</sup>, Symbicort<sup>®</sup> and Clenil Modulite<sup>®</sup> inhalers, which account for £48,451,843 (88% of total ICS) and 1,333,423 (81%) items for the period of July 2013–June 2014.

Figures 4 and 5 show the ICS breakdown for Wales, NE England and England.

**Figure 4. ICS breakdown. Cost per 1,000 PUs  
July 2013–June 2014**



**Figure 5. ICS breakdown. Items per 1,000 PUs  
July 2013–June 2014**



### 3.2.1 High-strength inhaled corticosteroids

Figures 6 and 7 show the prescribing of high-strength ICS for health boards in Wales as cost per 1,000 PUs and items per 1,000 PUs respectively. Use of high-strength ICS as a percentage of all ICS is a Local Comparator for 2014–2015 (using the same group of medicines as within this report).

The Local Comparator for 2014–2015 and proposed NPI for 2015–2016 have the aim of reviewing the use of ICS routinely in people with asthma, particularly those on high doses, encouraging the step down of the dose when clinically appropriate.

The British Thoracic Society/Scottish Intercollegiate Guidelines Network *British guidelines on the management of asthma* recommend that the dose of an ICS should be titrated to the lowest dose at which effective control of asthma is maintained<sup>1</sup>.

The Medicines and Healthcare Products Regulatory Agency (MHRA) advises that the prolonged use of high doses of ICS carries a risk of systemic side effects (e.g., adrenal suppression or crisis, growth retardation in children and young people, decrease in bone mineral density, cataracts and glaucoma)<sup>2</sup> and a range of psychological or behavioural effects (e.g., psychomotor hyperactivity, sleep disorders, anxiety, depression and aggression)<sup>3</sup>. The Committee on Safety of Medicines has also issued warnings about the use of high-strength ICS, particularly in children<sup>12</sup> and in relation to fluticasone<sup>13</sup>.

Figure 6. High-strength ICS prescribing trend. Cost per 1,000 PUs. March 2010–June 2014

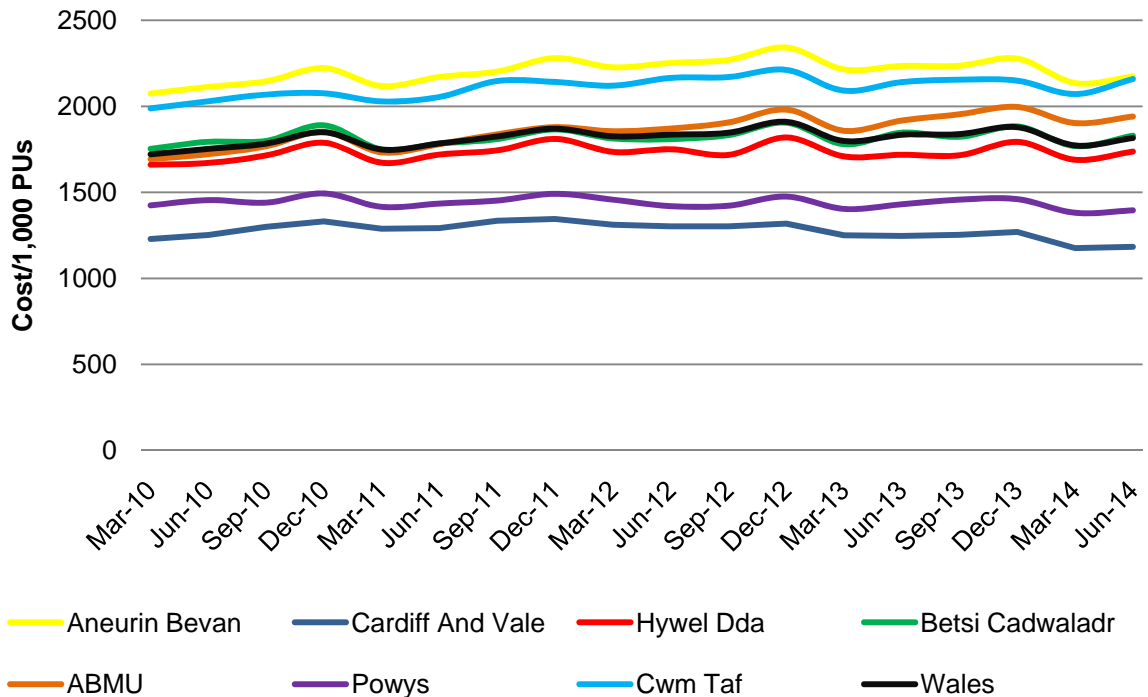
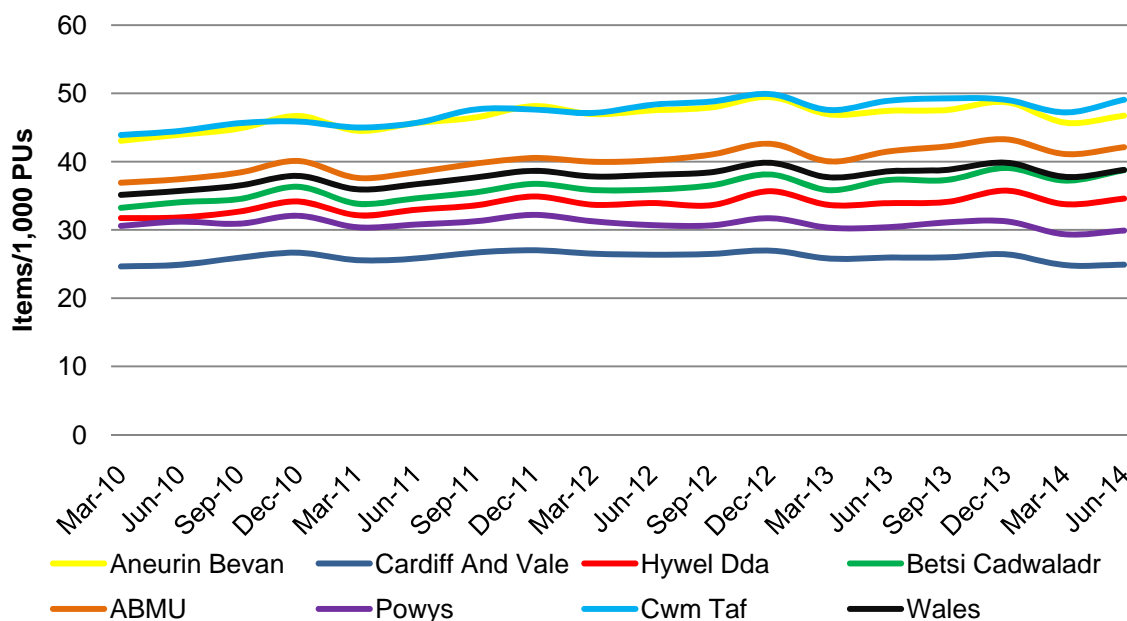


Figure 7. High-strength ICS prescribing trend. Items per 1,000 PUs.  
March 2010–June 2014



### 3.3 Respiratory prescribing initiatives in Wales

In early 2011, a task and finish group was established in Cardiff and Vale University Health Board to look at prescribing pathways in asthma and COPD. This group included a respiratory consultant, respiratory lead GP and pharmacy representation. The work included the development of an asthma and COPD pathway and educational sessions with prescribing leads and practice nurses. All practices in Cardiff and Vale University Health Board took part in a practical inhaler technique training session, and practice audits and reviews were undertaken. The key message within the health board is to ensure that the appropriate strength of ICS is chosen when starting patients on a combination of an ICS and a LABA.

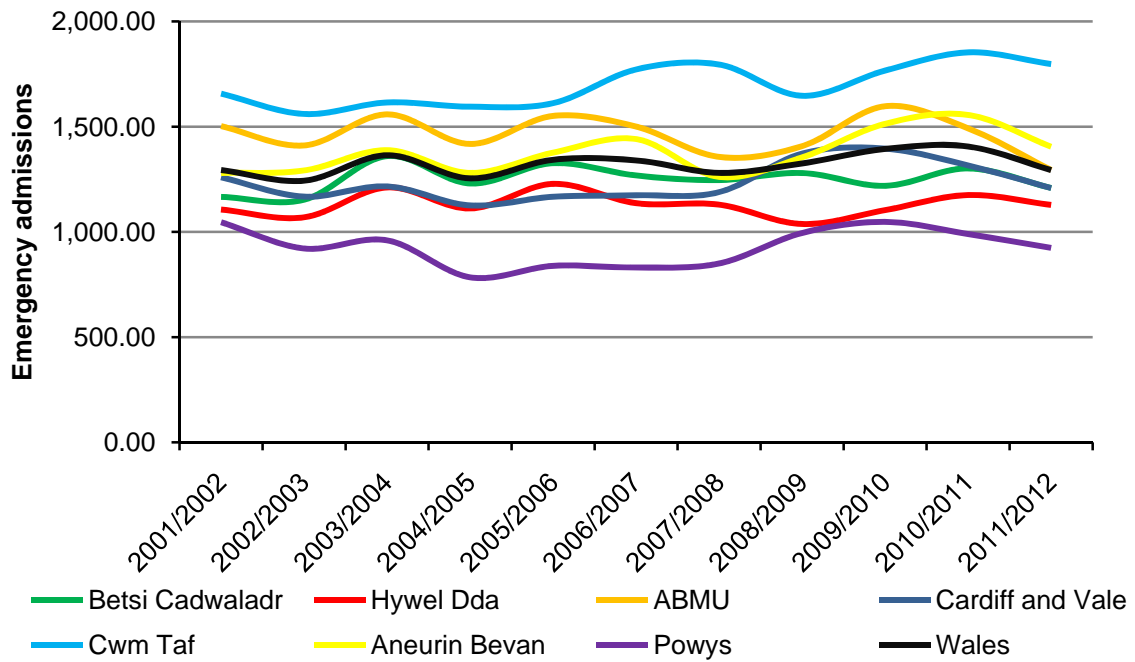
It appears that the initiative undertaken in Cardiff and Vale University Health Board has had a positive impact on prescribing, as prescribing of high-strength ICS remains lower than for the other health boards and admissions due to respiratory illness also remain low.

### 3.4 Emergency admission rates for respiratory disease

Figure 8 shows the rates of emergency admissions due to respiratory disease for the health boards in Wales. Cwm Taf Health Board has the highest emergency admissions rates for respiratory disease in Wales: 1,798 per 100,000 population (age standardised per 100,000 population). For most health boards the emergency admission rates have remained stable or fallen, with the exceptions of Aneurin Bevan and Cwm Taf Health Boards, which have seen increased rates since 2001<sup>14</sup>.

For Cwm Taf Health Board, COPD and other respiratory-related conditions are the most common causes of admissions to hospital. A significant correlation is reported between chronic conditions such as respiratory illness and economic inactivity in the Cwm Taf Health Board area, with higher numbers of people on incapacity benefits and a lower weekly household income<sup>15</sup>. It is also important to note that for health boards bordering England, some emergency admissions may be dealt with in secondary care settings based in England and that some cases originating in England may be treated in Wales; therefore not all data will be captured.

**Figure 8. Emergency admission rates for all respiratory diseases. Age standardised per 100,000 population**

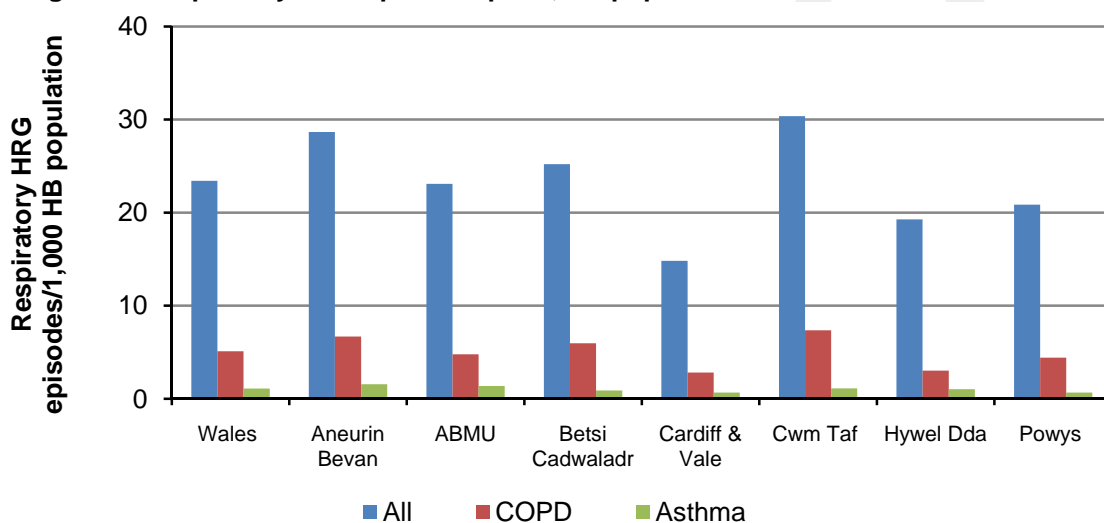


### 3.5 Respiratory outcomes data

Outcome data have been measured here using healthcare resource groups (HRGs). These are groups of patient-anonymised data, which refer to secondary care procedures and admissions. They comprise standard groupings of clinically similar treatments, which use common levels of healthcare resource<sup>16</sup>. HRGs help organisations to understand their activity in terms of the types of patients they care for and the treatments they undertake. The data are also linked back to GP practices. They cover a wide range of respiratory outcomes from lower respiratory tract infections to asthma- and COPD-related procedures and admissions. They enable the comparison of activity within and between different organisations and provide an opportunity to benchmark treatments and services to support trend analysis over time.

Figure 9 shows the HRG data for all respiratory-related HRGs, and asthma- and COPD-related HRGs per 1,000 health board population for April 2013–March 2014.

**Figure 9. Respiratory HRG episodes per 1,000 population for health boards in Wales**



Figures 10 and 11 show COPD- and asthma-related HRGs per 1,000 population against prescribing of high-strength ICS as DDDs per 1,000 PUs. The outcomes data and the prescribing data have been adjusted to account for disease prevalence variation between the health boards.

There is variation between the health boards in the relationship between COPD and asthma HRGs and the prescribing of high-strength ICS.

**Figure 10. COPD-related HRG episodes per 1,000 population against high-strength ICS prescribing**

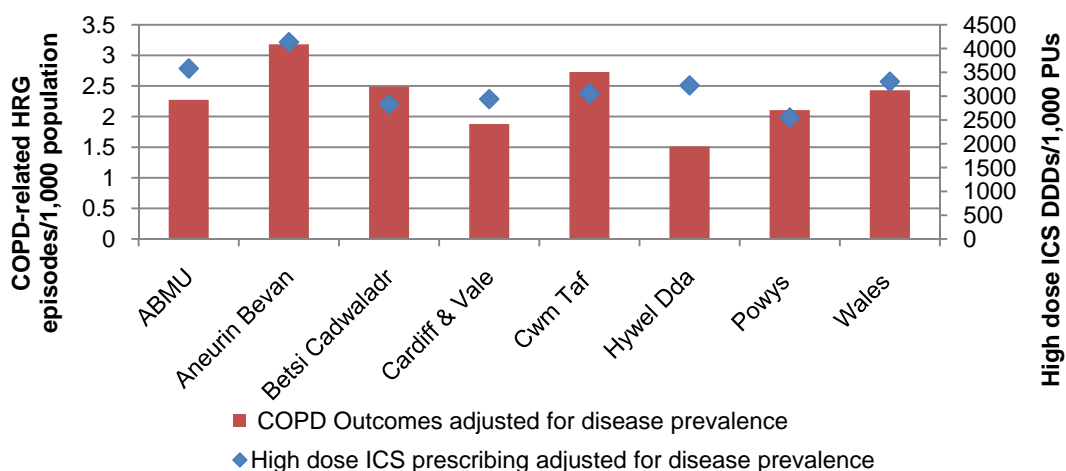
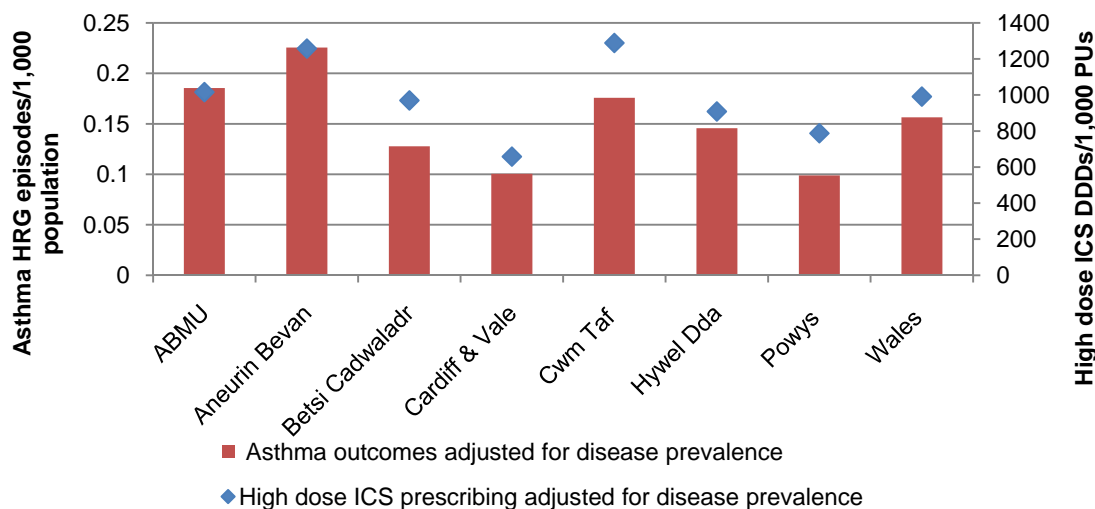


Figure 11. Asthma-related HRG episodes per 1,000 population against high-strength ICS prescribing



#### 4.0 GP CLUSTER COMPARATORS

To make realistic comparisons of prescribing between Wales and England, between the health boards and between the 64 established GP clusters in Wales, consideration of confounding factors is essential. WAPSU has developed cluster comparators based on disease prevalence and socio-economic variables, in order to appropriately benchmark prescribing data and influence prescribing behaviour accordingly.

The intention is to utilise this method of presenting prescribing data for a range of therapeutic areas, such as cardiovascular, endocrine and mental health, if it is considered useful. The method could also potentially be applied to clinical commissioning groups (CCGs) in England in order to make comparisons between Welsh health boards and English CCGs.

In this paper, respiratory product prescribing for GP clusters is analysed and therefore relevant variables for comparators are respiratory disease prevalence and deprivation.

##### *Other considerations*

It may be appropriate to view comparators in the context of other differences in practice, especially when making comparisons with areas in England or other nations. These could include local initiatives, dispensing GP practices, procurement costs, prescription charge exemptions and differences between local guidelines and formularies.

#### 4.1 Disease prevalence

Disease prevalence varies across the health boards in Wales and data on prevalence are available at GP cluster level from the GP Cluster Profiles 2013<sup>17</sup>. The source of the data is Audit+ – a non-mandatory analysis tool for GP practices used by more than 95% of GP practices in Wales to submit data weekly. Audit+ provides a count of patients with the identified chronic condition by 10-year age groups and sex. Another possible source of disease prevalence data is the Quality and Outcomes Framework (QOF), as chronic conditions are defined in the same way in both. QOF data is used primarily to monitor GP practice performance against a contract; secondary use of QOF data must be interpreted with caution<sup>5</sup>.

## 4.2 Deprivation

The link between poor health and deprivation is well recognised and people in the most deprived areas have higher levels of mental illness, hearing and sight problems, and in particular chronic conditions such as respiratory disease, cardiovascular disease and arthritis<sup>2</sup>. In Wales, the majority of deprived areas are found in areas of Cardiff, Swansea and Newport, the Welsh valleys and areas of the North Wales coast<sup>18</sup>.

While disease prevalence gives a straightforward measure of the proportion of the population with a condition, deprivation can have a more complex effect on prescribing levels through factors such as behavioural determinants, access to services and education<sup>19</sup>.

### 4.2.1 Index of Multiple Deprivation

Deprivation is multi-dimensional and takes into account many factors, which include income, housing, employment, general health, education, access to services, community safety and physical environment. The four countries of the UK each have their own index of multiple deprivation (IMD), each with slightly different ways of weighting certain factors. However, around half of the weight of each IMD comes from employment and income: factors which are common to all four countries and are major drivers of deprivation. Therefore, it may be appropriate to use the countries' IMDs for purposes of comparison if the differences in weightings are adjusted for<sup>20</sup>.

5.0 ANALYSIS OF RESPIRATORY GP CLUSTER PRESCRIBING

Figures 12 to 16 show prescribing of respiratory products for each of the 64 GP clusters in Wales. The GP clusters are grouped by colour with their most similar GP clusters in terms of disease prevalence and deprivation. The data show items per 1,000 PUs for the period of July 2013–June 2014.

Figure 12. ICS prescribing. Items per 1,000 PUs. July 2013–June 2014.

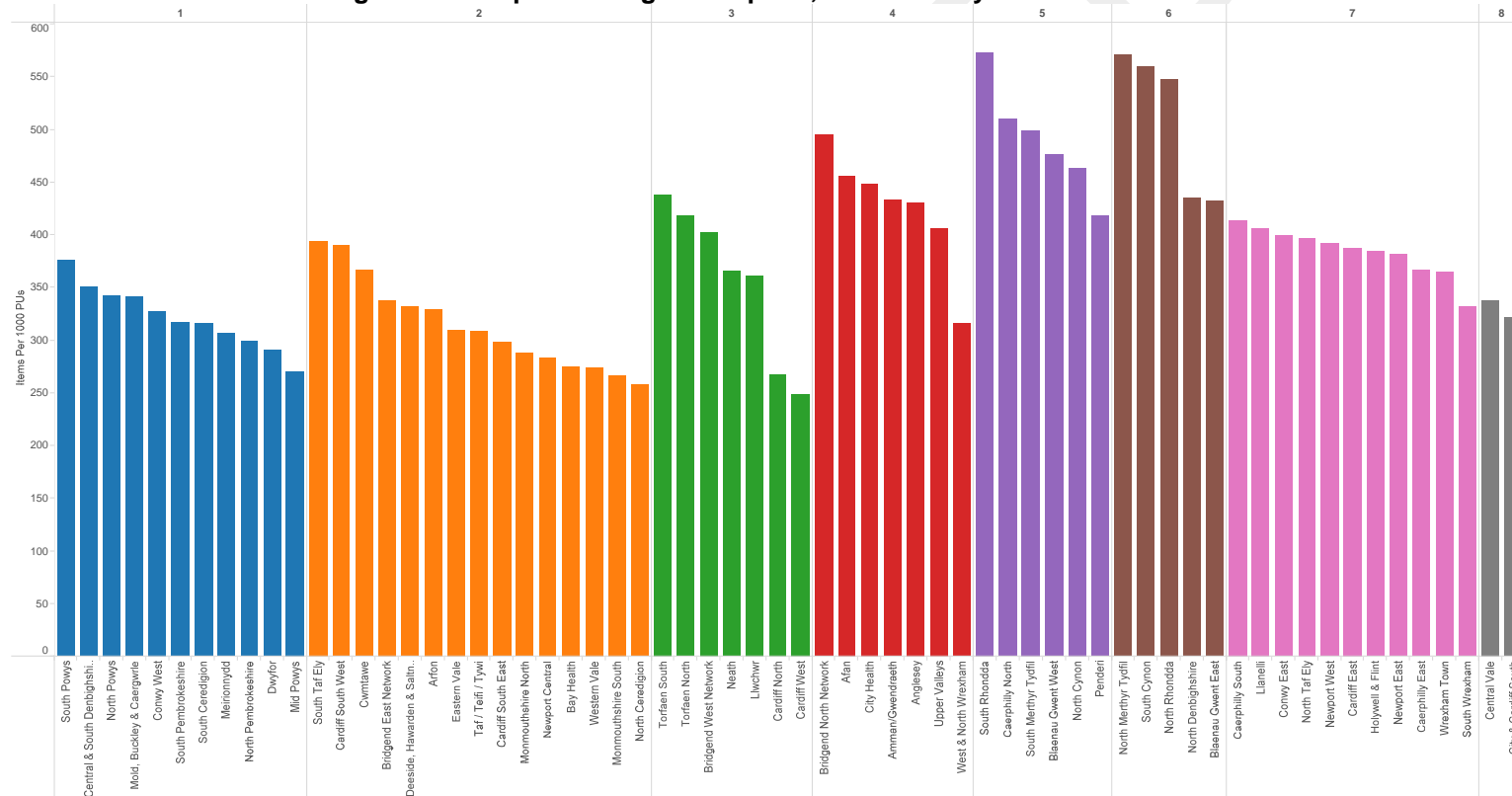


Figure 13. High-strength ICS prescribing. Items per 1,000 PUs. July 2013–June 2014.

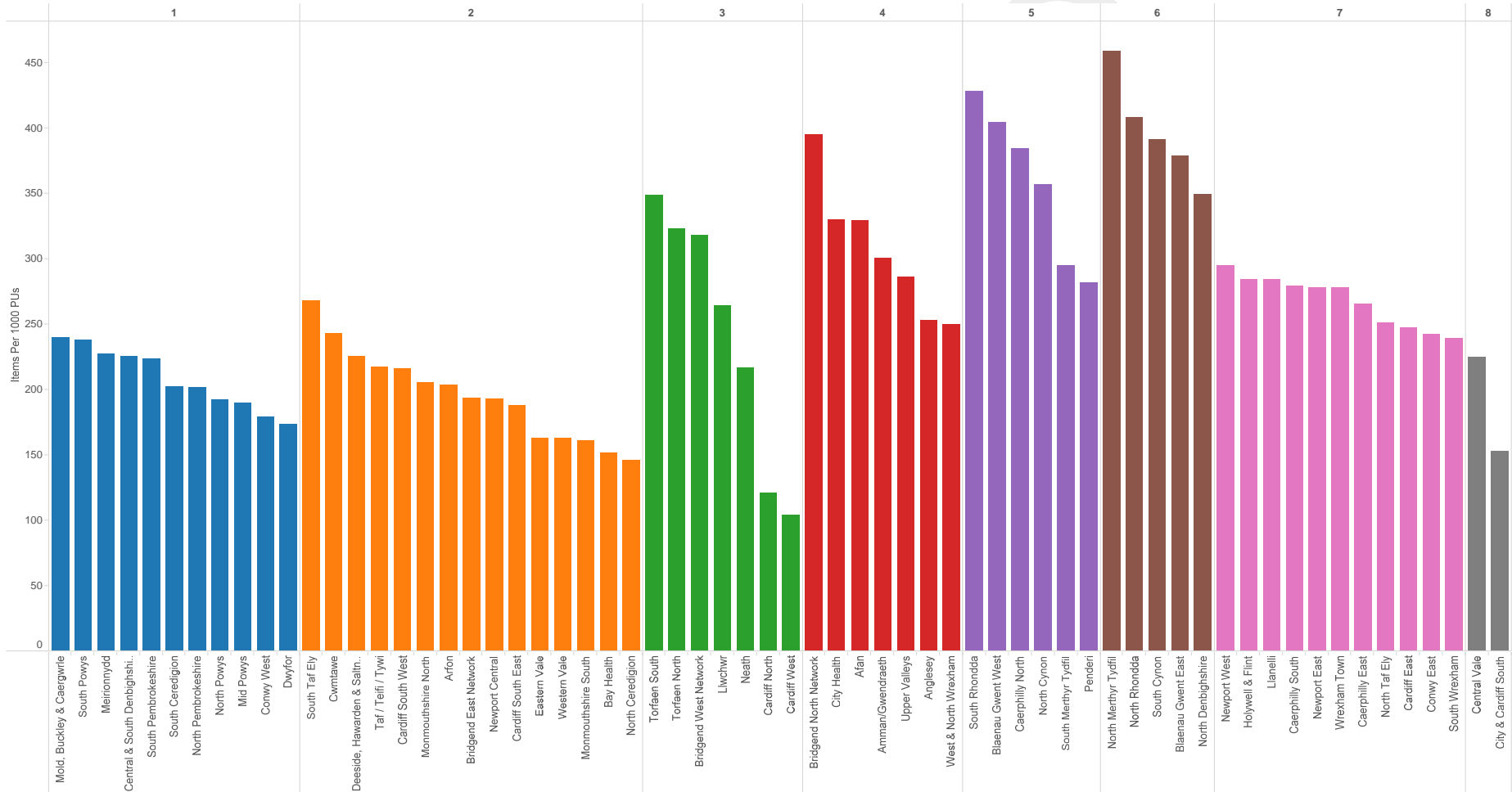


Figure 14. Combined ICS and LABA inhaler prescribing. Items per 1,000 PUs. July 2013–June 2014.

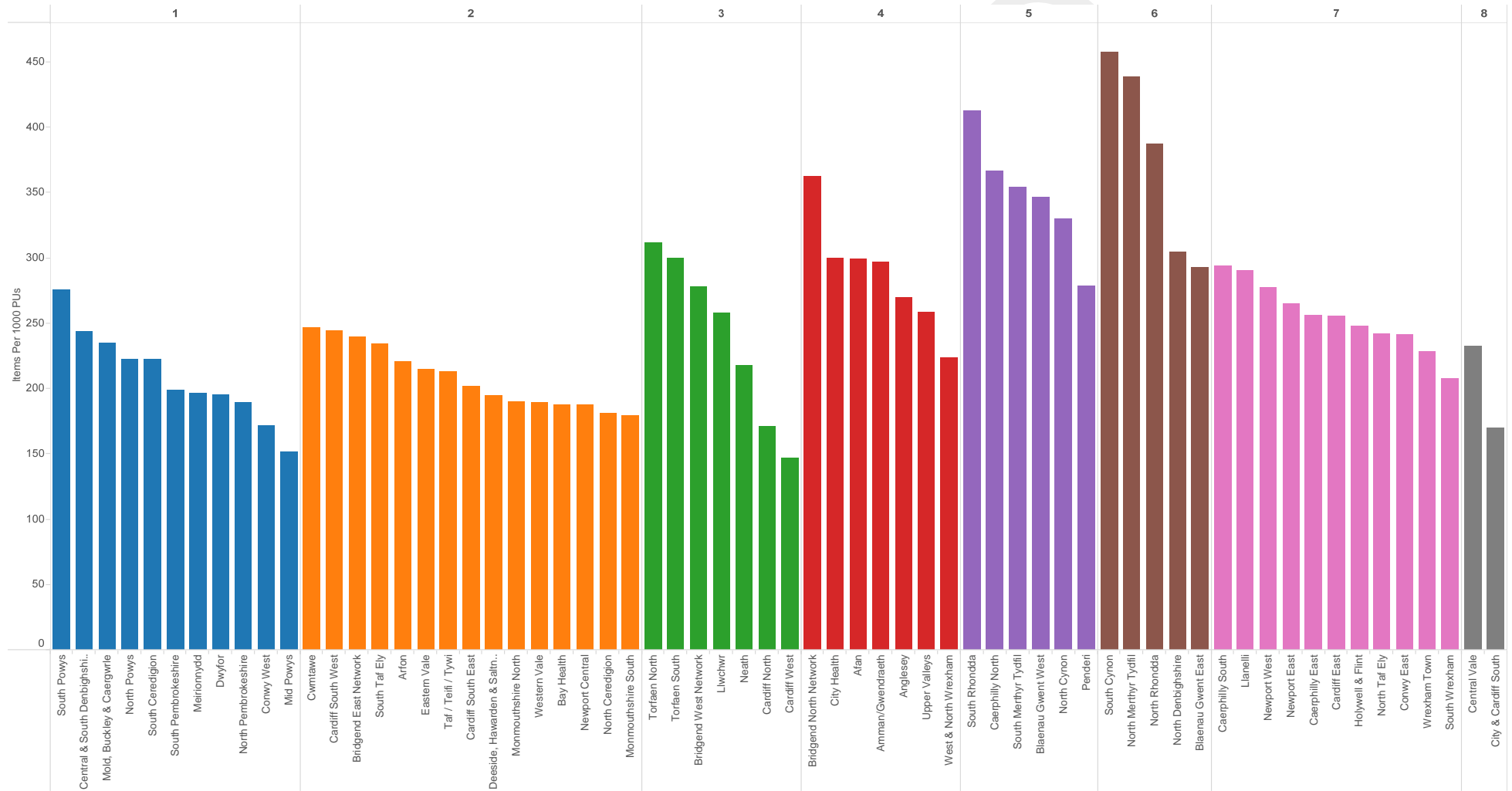


Figure 15. Bronchodilator prescribing. Items per 1,000 PUs. July 2013–June 2014.

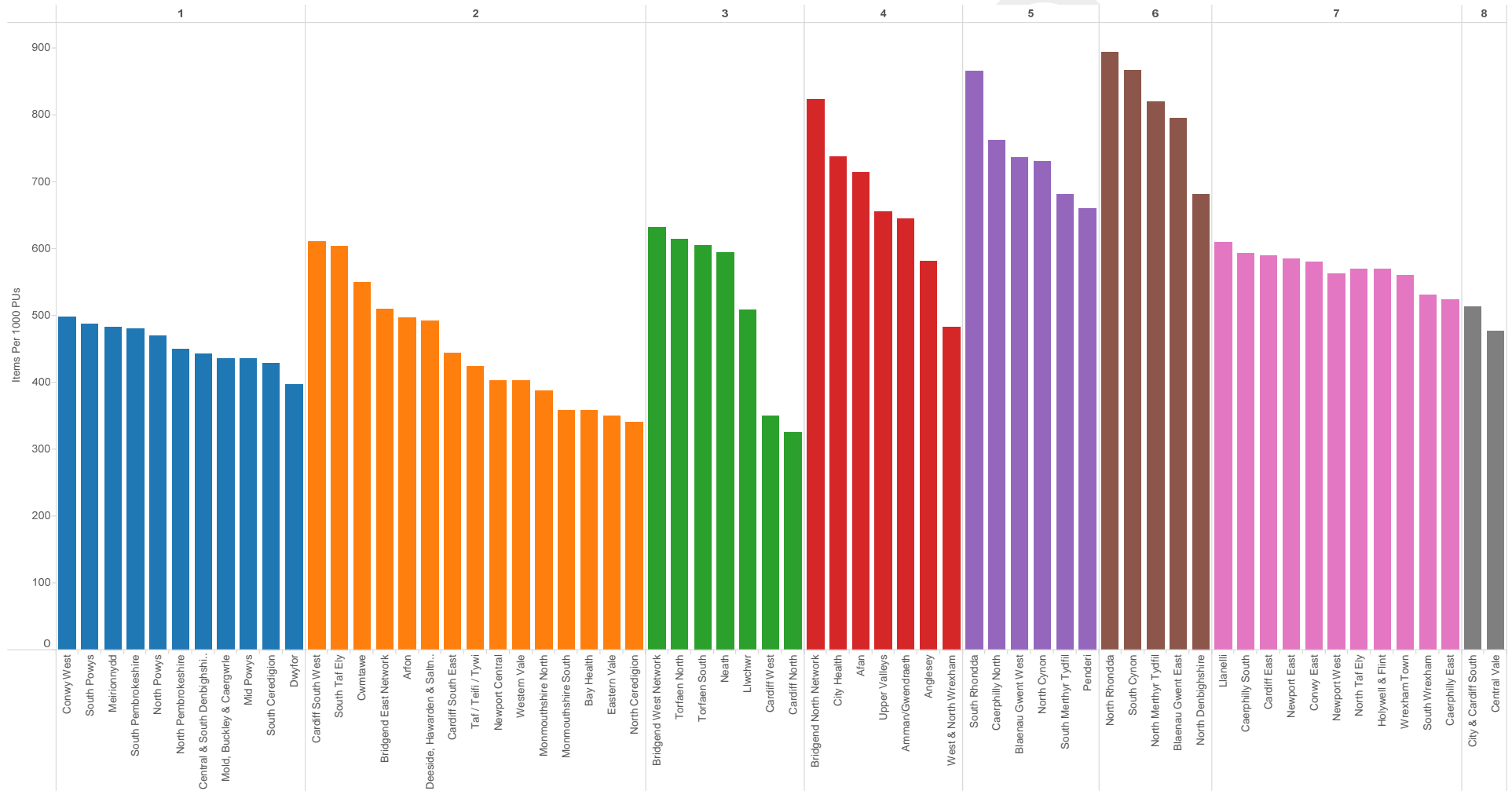


Figure 16. Tiotropium prescribing. Items per 1,000 PUs. July 2013–June 2014.

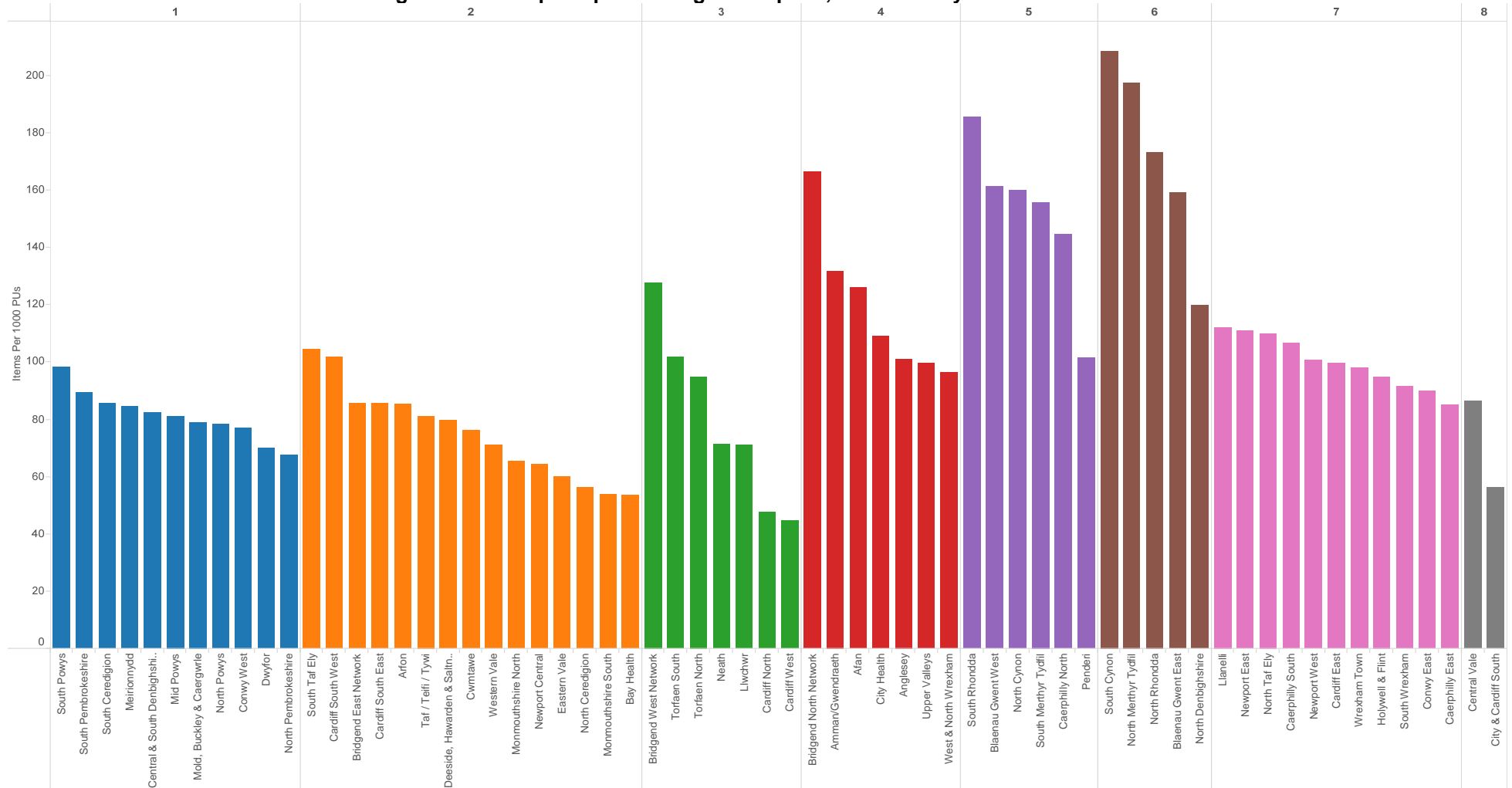
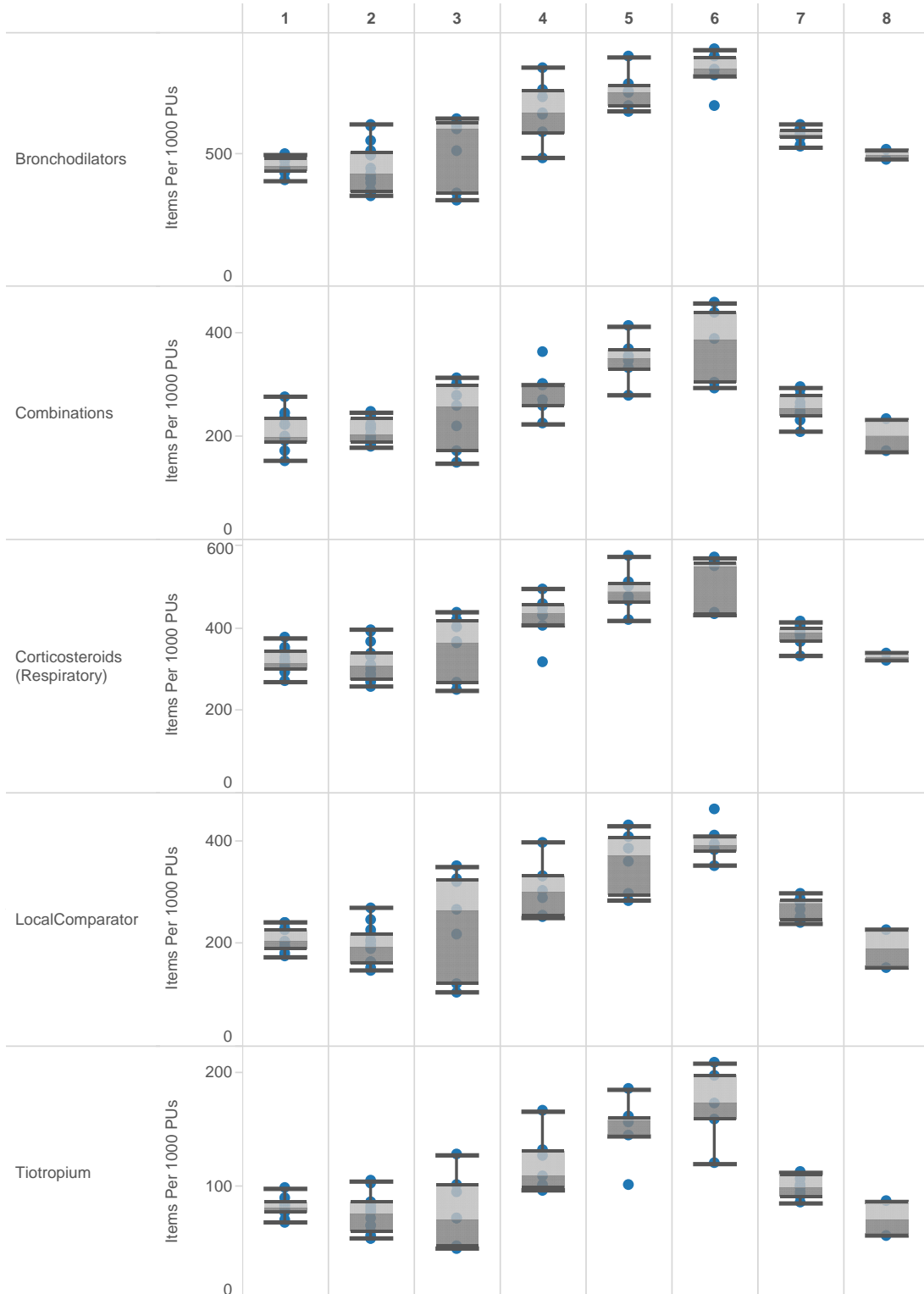


Figure 17 is a box and whisker plot for five measures of respiratory prescribing and shows the range of prescribing within GP cluster groupings. The blue dots represent the GP cluster, which are grouped into eight further groups based on their disease prevalence and deprivation similarity. The grey box represents the range of the middle 50% of practices.

Figure 17. Respiratory prescribing. Items per 1,000 PUs. July 2013–June 2014.



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