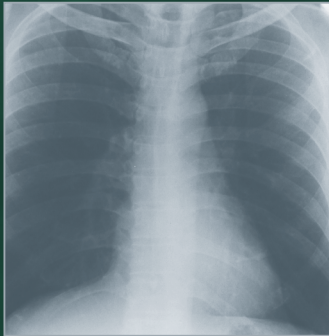


# National COPD Audit Programme

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## Planning for every breath

National Chronic Obstructive Pulmonary Disease (COPD) Audit Programme:  
Primary care audit (Wales) 2015–17

**Data analysis and methodology**  
**December 2017**

Prepared by:



**Royal College  
of Physicians**



Royal College of  
General Practitioners

**Imperial College  
London**

In partnership with:



**British  
Thoracic  
Society**



Commissioned by:



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## Contents

Methods.....	5
Section 1: Demographics and comorbidities .....	6
Section 2: Getting the diagnosis right.....	11
Section 3: Assessing severity and future risk.....	16
Section 4: Providing high-value care.....	24
Section 5: Ensuring equal and equitable care.....	32
5.1 <i>Patients with serious mental illness</i> .....	32
5.2 <i>Patients who currently smoke</i> .....	37
5.3 <i>Patients from a lower socioeconomic group</i> .....	42
Appendix A: Report preparation.....	53
Appendix B: Introduction to the National COPD Audit Programme.....	54
Appendix C: Audit methodology.....	55
Appendix D: Participating clusters and practices .....	62
Appendix E: Current members of the primary care workstream group.....	68
Appendix F: References .....	69

## Methods

This report presents national and health board data from the second cycle of the National Chronic Obstructive Pulmonary Disease (COPD) Audit Programme's Welsh primary care audit, which were extracted in June 2017 to capture activity between April 2015 and March 2017. Cluster results are available in the health board reports, which are available at [www.rcplondon.ac.uk/planningeverybreath](http://www.rcplondon.ac.uk/planningeverybreath). Primary care providers can access their data via the NHS Wales Primary Care Information Portal.

The first national report,<sup>1</sup> which presented data from 15 months of activity (January 2014 – March 2015), was published in October 2016. The methodology employed in the first cycle of audit has not been replicated in this round of audit and, therefore, like-for-like comparisons have not been undertaken. Essentially, in the first round of audit the denominator used was all people on the COPD register, as determined by the use of Quality and Outcomes Framework (QOF) codes. Recent work looking at the accuracy of COPD coding with respect to the QOF register has shown that use of other Read codes<sup>a</sup> (ie not necessarily included on the register) is more suggestive of COPD with high positive predictive value, and equally, some of the codes used in the QOF do not have a high sensitivity for identifying people with COPD.<sup>2,3</sup> Therefore, in this audit the denominator population is likely to be more accurate (potentially excluding some of the people on the QOF register, but also including others who are not), than if we had simply included people on the COPD QOF register. It is intended that this improved process will be replicated in any future rounds of audit, thus providing assurance on future measurement to determine change. It is, therefore, not possible at either national or health board level, to accurately assess the impact of any quality improvement (QI) initiatives that may have been instigated since the first report was published (ie because of this significant change in methodology). Practices that have embarked upon QI could, however, look at their own data at a level of detail which would allow them to reflect on any improvement work.

In the first audit cycle, data to answer 29 queries were extracted from GP systems. Feedback from stakeholders and learning from that work resulted in a reduction (via clinical and stakeholder consensus) to 14 queries for this extraction, with an increased focus on queries that directly relate to opportunities for improving quality.<sup>4</sup> We have also specifically focused upon diagnostic and care issues through a lens of equity and parity, and we would recommend further analysis at a local level where disparities are identified.

Where methodologies for numerator derivation have also differed considerably, the rationale is provided. For example, in the case of COPD exacerbations, where the codes are used inconsistently, similar work has shown that using proxy codes, such as prescription of oral prednisolone and chest infection diagnosis codes (in combination), can be used to derive exacerbation rates.<sup>2,5,6,7</sup> A full data analysis and cleaning methodology can be found in Appendix C.

Please note that percentages are rounded to one decimal place, so the total may not come to 100% in all cases.

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<sup>a</sup> Read Codes are a coded thesaurus of clinical terms. They provide a standard vocabulary for clinicians to record patient findings and procedures in health and social care IT systems.

<https://digital.nhs.uk/article/1104/Read-Codes>



## Section 1: Demographics and comorbidities

[Back to contents](#)

### Key findings

- The average age of the patient cohort was **70.7 years old**.
- There were a **similar number of men and women** (50.5% vs 49.5%). This is consistent with the findings of other studies conducted in the UK, but different from the COPD demographic internationally, where the disease is considerably more prevalent in men.<sup>8,9,10</sup>
- The data confirm what has been found in other published literature:<sup>11,12</sup> people with COPD are likely to have at least one other long-term condition. The most common physical comorbidities were **cardiovascular**; hypertension (52.7%) and coronary heart disease (40.0%), diabetes (22.6%), osteoporosis (12.9%), painful conditions<sup>b</sup> (12.6%) and stroke (10.4%).
- Mental health problems were common in the cohort:
  - **30.5%** of the cohort have a current diagnosis of **anxiety**.
  - **30.1%** have a current diagnosis of **depression**.
  - Despite these high rates, in the past 2 years, at most **17.5% had a record of screening for depression or anxiety**; National Institute for Health and Care Excellence (NICE) guidance recommends that primary care be alert to possible depression or anxiety in patients with a chronic physical health problem.<sup>13,14</sup> Anxiety and depression significantly reduce quality of life, and can impede self-management (for example, attendance and completion of pulmonary rehabilitation (PR)).<sup>15,16,17,18</sup>
  - **7.8%** had ever had a diagnosis of a **severe mental (ie psychotic) illness (SMI)**. This is approximately eight times higher than the rates in the general population.<sup>19</sup>
- In addition, **41.9%** of this cohort had a **co-diagnosis of asthma** recorded. This is likely to reflect diagnostic uncertainty, and is not in keeping with epidemiological data of validated diagnostic overlap.<sup>2,5,6,7</sup> This finding should, therefore, not be accepted at face value. Treatment pathways are different for these conditions and poor-value healthcare is a likely outcome if diagnostic confusion exists.<sup>20,21</sup>

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<sup>b</sup> Defined as patients who had a record of four or more prescription analgesia medications in the past 12 months, or 4 or more specified anti-epileptics in the absence of an epilepsy Read code in the past 12 months.

## Navigation

This section contains the following tables. If viewing this report on a computer, you can select the table that you wish to see from the list below.

- [1.1 Gender](#)
- [1.2 Age](#)
- [1.3 Comorbidities](#)

### 1.1 Gender

Gender	Wales N=82,696	Abertawe Bro Morgannwg University LHB (ABMU) N=14,395	Aneurin Bevan LHB (AB) N=16,428	Betsi Cadwaladr University LHB (BCU) N=21,511	Cardiff & Vale University LHB (CVU) N=7,892	Cwm Taf LHB (CT) N=8,904	Hywel Dda LHB (HD) N=10,348	Powys Teaching LHB (PT) N=3,218
Male	41,734 (50.5%)	7,236 (50.3%)	8,222 (50.1%)	10,879 (50.6%)	3,790 (48.0%)	4,427 (49.7%)	5,438 (52.6%)	1,742 (54.1%)
Female	40,959 (49.5%)	7,158 (49.7%)	8,206 (50.0%)	10,632 (49.4%)	4,102 (52.0%)	4,477 (50.3%)	4,908 (47.4%)	1,476 (45.9%)
Unknown	3 (0.0%)	1 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (0.0%)	0 (0.0%)

### 1.2 Age

Age (years)	Wales N=82,696	ABMU N=14,395	AB N=16,428	BCU N=21,511	CVU N=7,892	CT N=8,904	HD N=10,348	PT N=3,218
Mean	70.7 (11.2)	70.1 (11.3)	70.3 (11.3)	71.2 (11.3)	70.3 (11.4)	70.6 (11.0)	70.9 (11.0)	72.1 (11.3)
Minimum	35	35	35	35	35	35	35	37
Maximum	117	106	116	117	105	116	116	103
Mean male age	70.9 (11.0)	70.4 (11.1)	70.5 (10.9)	71.3 (11.1)	70.4 (11.5)	70.9 (10.8)	71.3 (10.7)	72.5 (10.7)
Mean female age	70.4 (11.4)	69.8 (11.4)	70.0 (11.6)	71.1 (11.4)	70.3 (11.4)	70.2 (11.3)	70.5 (11.3)	71.7 (11.9)



### 1.3 Comorbidities

#### ***Rationale for inclusion:***

To allow assessment of the percentage of COPD patients with comorbidities (to better categorise the audited cohort). **NICE CG101: *Chronic obstructive pulmonary disease in over 16s: diagnosis and management***<sup>22</sup> recommends that comorbidities are considered in the management of patients with COPD.

#### ***Rationale for inclusion of depression and anxiety screening:***

**NICE CG91: *Depression in adults with a chronic physical health problem: recognition and management***<sup>13</sup> / **NICE CG113: *Generalised anxiety disorder and panic disorder in adults: management***<sup>14</sup>

NICE guidelines for both depression and anxiety recommend primary care: i) be alert to possible depression (particularly in patients with a past history of depression or a chronic physical health problem with associated functional impairment) and consider asking patients who may have depression two screening questions; and ii) consider the diagnosis of generalised anxiety disorder in people presenting with anxiety or significant worry, and in people who attend primary care frequently who have a chronic physical health problem.

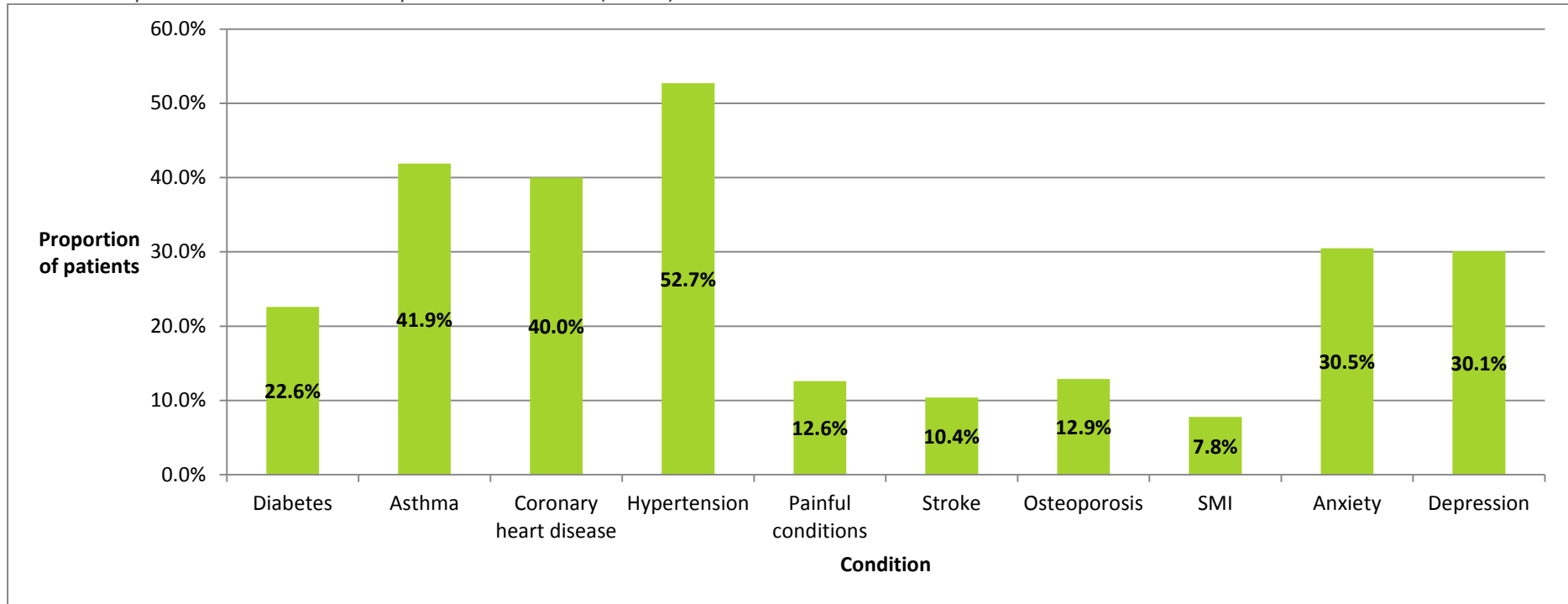
Evidence suggests that up to 40% of COPD patients suffer from depression/anxiety and that psychological intervention and PR programmes improve outcomes.<sup>15,16,17,18</sup>



<i>Condition</i>	<b>Wales N=82,696</b>	<b>ABMU N=14,395</b>	<b>AB N=16,428</b>	<b>BCU N=21,511</b>	<b>CVU N=7,892</b>	<b>CT N=8,904</b>	<b>HD N=10,348</b>	<b>PT N=3,218</b>
<b>Asthma</b>	<b>34,622 (41.9%)</b>	6,704 (46.6%)	6,705 (40.8%)	8,746 (40.7%)	3,235 (41.0%)	3,582 (40.2%)	4,340 (41.9%)	1,310 (40.7%)
<b>Bronchiectasis</b>	<b>3,946 (4.8%)</b>	578 (4.0%)	796 (4.9%)	1,054 (4.9%)	336 (4.3%)	375 (4.2%)	638 (6.2%)	169 (5.3%)
<b>Coronary heart disease</b>	<b>33,054 (40.0%)</b>	5,880 (40.9%)	6,546 (39.9%)	7,988 (37.1%)	3,272 (41.5%)	3,938 (44.2%)	4,325 (41.8%)	1,105 (34.3%)
<b>Diabetes</b>	<b>18,685 (22.6%)</b>	2,969 (20.6%)	4,434 (27.0%)	4,909 (22.8%)	1,568 (19.9%)	1,969 (22.1%)	2,123 (20.5%)	713 (22.2%)
<b>Heart failure</b>	<b>7,443 (9.0%)</b>	1,270 (8.8%)	1,357 (8.3%)	2,021 (9.4%)	752 (9.5%)	834 (9.4%)	901 (8.7%)	308 (9.6%)
<b>Hypertension</b>	<b>43,588 (52.7%)</b>	7,299 (50.7%)	9,125 (55.6%)	10,929 (50.8%)	4,096 (51.9%)	5,274 (59.2%)	5,225 (50.5%)	1,640 (51.0%)
<b>Lung cancer</b>	<b>1,921 (2.3%)</b>	305 (2.1%)	346 (2.1%)	556 (2.6%)	203 (2.6%)	204 (2.3%)	228 (2.2%)	79 (2.5%)
<b>Painful conditions<sup>c</sup></b>	<b>10,450 (12.6%)</b>	1,945 (13.5%)	2,224 (13.5%)	2,532 (11.8%)	998 (12.7%)	1,215 (13.7%)	1,149 (11.1%)	387 (12.0%)
<b>Stroke</b>	<b>8,623 (10.4%)</b>	1,628 (11.3%)	1,703 (10.4%)	2,123 (9.9%)	944 (12.0%)	875 (9.8%)	1,007 (9.7%)	343 (10.7%)
<b>Osteoporosis</b>	<b>10,657 (12.9%)</b>	2,206 (15.3%)	1,769 (10.8%)	2,972 (13.8%)	1,144 (14.5%)	1,060 (11.9%)	1,101 (10.6%)	405 (12.6%)
<b><i>Mental health conditions</i></b>								
<b>Severe mental illness (SMI): Schizophrenia, bipolar disorder and other psychotic illness</b>	<b>6,448 (7.8%)</b>	1,092 (7.6%)	1,398 (8.5%)	1,525 (7.1%)	786 (10.0%)	666 (7.5%)	810 (7.8%)	171 (5.3%)
<b>Anxiety</b>	<b>25,180 (30.5%)</b>	4,447 (30.9%)	5,296 (32.2%)	6,272 (29.2%)	2,443 (31.0%)	2,828 (31.8%)	3,076 (29.7%)	818 (25.4%)
<b><i>Screened for anxiety or been diagnosed in the past 2 years</i></b>	<b>4,108 (5.0%)</b>	618 (4.3%)	857 (5.2%)	1,133 (5.3%)	426 (5.4%)	407 (4.6%)	559 (5.4%)	108 (3.4%)
<b>Depression</b>	<b>24,861 (30.1%)</b>	4,467 (31.0%)	5,461 (33.2%)	5,752 (26.7%)	2,825 (35.8%)	2,786 (31.3%)	2,736 (26.4%)	834 (25.9%)
<b><i>Screened for depression or been diagnosed in the past 2 years</i></b>	<b>14,465 (17.5%)</b>	1,360 (9.5%)	2,874 (17.5%)	6,625 (30.8%)	724 (9.2%)	1,386 (15.6%)	989 (9.6%)	507 (15.8%)

<sup>c</sup> Defined as patients who had a record of four or more prescription analgesia medications in the past 12 months, or four or more specified anti-epileptics in the absence of an epilepsy Read code in the past 12 months.

The 10 most prevalent comorbidities in patients with COPD (Wales)





## Section 2: Getting the diagnosis right

[Back to contents](#)

### Key findings

- NICE guidance and quality standards state that **all patients over the age of 35** who present with symptoms of COPD should have a spirometry test to confirm their diagnosis.<sup>22,23</sup>
  - **54.3%** of patients **diagnosed since the last round of audit** (ie within the last two years) had a **record of FEV1/FVC<sup>d</sup> ratio** (ie using the list 339 Read codes in appendix C) with a corresponding result that is consistent with COPD (eg an FEV1/FVC ratio of between 0.2 and 0.7).
  - However, only **11.1%** of patients had a record of the gold standard **diagnostic test for COPD** (a post-bronchodilator FEV1/FVC, as recorded by **Read code 339m**).
    - **8.5% of the population** (76.0% of those with code 339m) had a result for this test that was consistent with airways obstruction and COPD (ie an FEV1/FVC ratio of between 0.2 and 0.7).
    - **2.7% of the population** (24.0% of those with code 339m) had a result recorded for this code that was inconsistent with COPD or was invalid.
- NICE guidelines recommend that, in addition to spirometry, **all patients should have a chest X-ray** at the time of their initial diagnosis to exclude other pathologies.<sup>22</sup>
  - Of the cohort of patients diagnosed since the last round of audit (ie in the past two years), **39.6% had a chest X-ray or CT scan within 6 months of their diagnosis** (pre or post).

### Navigation

*This section contains the following tables. If viewing this report on a computer, you can select the table that you wish to see from the list below.*

- [2.1 Spirometry](#)
  - [2.1.1 The percentage of people diagnosed with COPD in the past 2 years who have a post-bronchodilator forced expiratory volume](#)

<sup>d</sup> Forced expiratory volume (FEV1) / forced vital capacity (FVC).

(FEV1) / forced vital capacity (FVC) (latest ever recorded) <0.7 (consistent with airways obstruction)

- 2.1.2 Spirometry: The percentage of people diagnosed with COPD in the past 2 years who have any FEV1/FVC ratio code (including 339m) with a result of >0.2 and <0.7
- 2.2 X-ray
  - 2.2.1 The percentage of people with COPD who had a chest X-ray or CT scan 6 months prior to diagnosis or within 6 months of diagnosis (ie when COPD code first added to disease register) (for diagnoses made in the past 2 years)

## 2.1 Spirometry

### *Rationale for inclusion:*

**NICE CG101 COPD and NICE QS10 quality statement 1:** *People aged over 35 years who present with a risk factor and one or more symptoms of chronic obstructive pulmonary disease (COPD) should have post-bronchodilator spirometry. A post-bronchodilator FEV1 / vital capacity (VC)<sup>e</sup> or FEV1/FVC <0.7 is required to make a diagnosis of COPD.*<sup>22,23</sup>

COPD can be diagnosed when the patient has been exposed to a known risk factor, they have a typical clinical presentation and when there is an objective measurement of fixed airways obstruction as determined by good-quality spirometry. A small minority of patients may need more complex hospital-based lung function or they may be diagnosed with emphysema through CT scanning.

It was agreed by the primary care workstream group that practices working to improve diagnosis quality 'today' should be measured according to their practice now (ie rather than historical practice that may no longer be adopted). These spirometry queries were, therefore, modified to only reflect those patients who had been diagnosed with COPD in the past 2 years.

### **2.1.1 The percentage of people diagnosed with COPD in the past 2 years who have a post-bronchodilator FEV1/FVC <0.7 (consistent with airways obstruction)**

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<sup>e</sup>A post-bronchodilator FEV1/Slow or relaxed VC Read code does not exist, so it was not possible to extract information about the frequency with which this particular diagnostic test is conducted.

Full assurance about the diagnosis of COPD being made with accurate spirometry can only be made in retrospect if a flow volume curve and time volume trace is seen in conjunction with correct patient demographics and key spirometric measures. These usually are uploaded as PDF files to patient notes from spirometry software and equipment.<sup>24</sup> However, with such a large denominator population, we have looked for the presence of Read code 339m, alongside a value of between 0.2 and 0.7, to assure us that: a) the test was conducted post bronchodilation, and b) the value is consistent with obstruction. The Welsh Respiratory Health Implementation Group (RHIG) has been supplying practices with spirometry equipment that can auto-upload results to GP files and code correctly. Therefore, in future extractions, operators and facilitators of spirometry in Wales should ensure the code 339m is uploaded accurately.

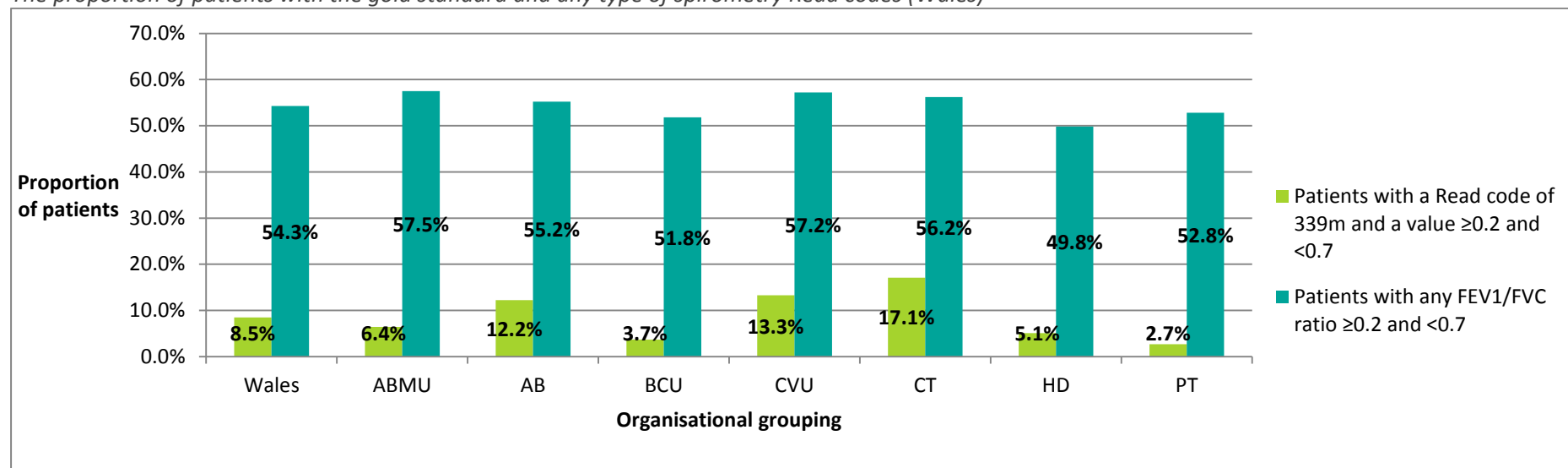
<i>Spirometry code</i>	<b>Wales N=10,868</b>	<b>ABMU N=2,023</b>	<b>AB N=2,140</b>	<b>BCU N=2,632</b>	<b>CVU N=1,163</b>	<b>CT N=1,117</b>	<b>HD N=1,418</b>	<b>PT N=375</b>
<b>No 339m code</b>	<b>9,660 (88.9%)</b>	1,861 (92.0%)	1,796 (83.9%)	2,509 (95.3%)	969 (83.3%)	855 (76.5%)	1,314 (92.7%)	356 (94.9%)
<b>339m is ≥0.2 and &lt;0.7</b>	<b>918 (8.5%)</b>	130 (6.4%)	262 (12.2%)	98 (3.7%)	155 (13.3%)	191 (17.1%)	72 (5.1%)	10 (2.7%)
<b>339m invalid or ≥0.7</b>	<b>290 (2.7%)</b>	32 (1.6%)	82 (3.8%)	25 (1.0%)	39 (3.4%)	71 (6.4%)	32 (2.3%)	9 (2.4%)

### 2.1.2 Spirometry: The percentage of people diagnosed with COPD in the past 2 years who have any FEV1/FVC ratio code (including 339m) with a result of >0.2 and <0.7

We have also looked at some other spirometry ratio codes, which may provide some assurance of correct spirometric diagnosis. The improvement project here would be to check patients who have these codes and review their original diagnostic test and then add/change to an appropriate 339m code, redo spirometry or review what is causing the patient's symptoms.

	<b>Wales N=10,868</b>	<b>ABMU N=2,023</b>	<b>AB N=2,140</b>	<b>BCU N=2,632</b>	<b>CVU N=1,163</b>	<b>CT N=1,117</b>	<b>HD N=1,418</b>	<b>PT N=375</b>
<b>Any spirometry codes ≥0.2 and &lt;0.7</b>	<b>5,906 (54.3%)</b>	1,163 (57.5%)	1,182 (55.2%)	1,364 (51.8%)	665 (57.2%)	628 (56.2%)	706 (49.8%)	198 (52.8%)

The proportion of patients with the gold standard and any type of spirometry Read codes (Wales)



## 2.2 X-ray

### 2.2.1 The percentage of people with COPD who had a chest X-ray or CT scan 6 months prior to diagnosis or within 6 months of diagnosis (for diagnoses made in the past 2 years)

#### *Rationale for inclusion:*

**NICE CG101 COPD** recommends that, at the time of their initial diagnostic evaluation, in addition to spirometry all patients should have a chest X-ray to exclude other pathologies.

In the previous audit, we looked for the presence of a code for chest X-ray either side (within 3 months prior and within 6 months after) of the first time the code that added a patient to the COPD register was recorded. Practices started to code COPD for QOF purposes in 2004.<sup>25</sup> At that time, the codes confirming that chest X-ray had been done needed to be added manually from written reports. It was agreed by the primary care workstream group that practices working to improve diagnosis quality 'today' should be measured according to their practice now (ie rather than historical practice that may no longer be adopted). This query was, therefore, modified to only reflect those patients diagnosed with COPD in the past 2 years.

	Wales N=10,868	ABMU N=2,023	AB N=2,140	BCU N=2,632	CVU N=1,163	CT N=1,117	HD N=1,418	PT N=375
Chest X-ray within 6 months	4,300 (39.6%)	899 (44.4%)	668 (31.2%)	1,003 (38.1%)	508 (43.7%)	429 (38.4%)	630 (44.4%)	163 (43.5%)





## Section 3: Assessing severity and future risk

[Back to contents](#)

### Key findings

- NICE guidelines recommend that MRC score be used to grade the breathlessness of all patients with COPD.<sup>22</sup>
  - Almost **40% of audited patients did not have an MRC score recorded** in the past year.
  - The majority of patients with a score had either **MRC score 2 (26.8%) or 3 (16.6%)**, reflecting a similar distribution of breathlessness to that found in the first round of audit.
- **FEV1 %-predicted** (results of which can determine treatment thresholds for inhaled therapies)<sup>22</sup> was recorded in only **27.5% of the population** in the past year.
  - Large reductions in FEV1 beyond what would be expected in usual COPD decline (>100 mL) should also trigger a breathlessness cause reassessment that can detect other treatable causes such as lung cancer.
- Tobacco smoking is the cause of COPD in the vast majority of people. NICE quality statements say that people should be asked whether they smoke by their healthcare practitioner annually, and those who smoke should be offered advice on how to stop.<sup>26</sup>
  - Despite this, **22.6% of the cohort had no record of their smoking status in the past year.**
  - A further **26.5% were self-reported current smokers.**
- Using a combination of lower respiratory tract infections (LRTI) and the concurrent recording of antibiotics and oral prednisolone Read codes, a validated methodology for identifying **exacerbations** in primary care,<sup>3,27</sup> results revealed that **58.1% of patients had zero indication of exacerbations in the past year** and **14.6%** of patients were recorded as having **more than two exacerbations.**<sup>22</sup>
  - This is in contrast to Read-coded records of exacerbations (using either 66YF (annual exacerbation number) or count of HY3122, H370, H3y1 (individual exacerbation)), which suggest that exacerbations are infrequent; **82.8%** of patients recorded as having **zero exacerbations in the past year** and only **2.9%** of patients were recorded as having **more than two exacerbations.**
- People with **low oxygen saturations** (ie of  $\leq 92\%$ )<sup>28</sup> should have evidence of an **arterial blood gas** measurement or be referred for **home oxygen** therapy; however, in the last two years, this happened in only **11.1%** of relevant patients.

## Navigation

This section contains the following tables. If viewing this report on a computer, you can select the table that you wish to see from the list below.

- [3.1 The proportion of people with COPD with MRC scores 1, 2, 3, 4, 5 and 'not recorded' in the past year](#)
- [3.2 The proportion of people with COPD who have a measure of FEV1 %-predicted value recorded in the past year](#)
- [3.3 The proportion and status of people with COPD who were asked about tobacco smoking in the past year](#)
- [3.4 Exacerbation count in the past year](#)
  - [3.4.1 Using validated method](#)
  - [3.4.2 Using GP-recorded exacerbation codes](#)
- [3.5 Oxygen: management and treatment](#)

### 3.1 The proportion of people with COPD with MRC scores 1, 2, 3, 4, 5 and 'not recorded' in the past year

#### *Rationale for inclusion:*

**NICE CG101 COPD:** *One of the primary symptoms of COPD is breathlessness. The MRC breathlessness scale should be used to grade the breathlessness according to the level of exertion required to elicit it.*

Breathlessness of MRC score 3 or more represents a significant functional impairment.<sup>29</sup> Patients with MRC score 3 or more should be receiving the key components of a review. They should be receiving pulmonary rehabilitation (PR) as soon as possible. They may also require additional pharmacological interventions and oxygen therapy, so a more targeted and intensive review may be required.

The 2014–15 audit report recorded both whether people had a breathlessness score 'ever' recorded and also whether it was calculated in the past year. The latter analysis only was repeated, as breathlessness and quality of life scores are now considered more important than degree of airflow obstruction when making decisions on therapies in COPD.<sup>30</sup> Therefore, the audit standard and expectation for best practice would now be for an MRC score to be recorded within the past year. Please note, results from the 'past 15 months' (rather than past 12 months) were extracted, to allow some leeway for general practices to have completed their annual reviews.

MRC score	Wales N=82,696	ABMU N=14,395	AB N=16,428	BCU N=21,511	CVU N=7,892	CT N=8,904	HD N=10,348	PT N=3,218
1	6,368 (7.7%)	999 (6.9%)	1,138 (6.9%)	2,006 (9.3%)	626 (7.9%)	492 (5.5%)	802 (7.8%)	305 (9.5%)
2	22,144 (26.8%)	3,737 (26.0%)	4,498 (27.4%)	5,745 (26.7%)	2,069 (26.2%)	2,439 (27.4%)	2,875 (27.8%)	781 (24.3%)
3	13,715 (16.6%)	2,638 (18.3%)	2,743 (16.7%)	3,162 (14.7%)	1,414 (17.9%)	1,682 (18.9%)	1,511 (14.6%)	565 (17.6%)
4	7,021 (8.5%)	1,487 (10.3%)	1,186 (7.2%)	1,524 (7.1%)	888 (11.3%)	881 (9.9%)	778 (7.5%)	277 (8.6%)
5	1,153 (1.4%)	261 (1.8%)	226 (1.4%)	212 (1.0%)	148 (1.9%)	129 (1.5%)	145 (1.4%)	32 (1.0%)
Not recorded	32,295 (39.1%)	5,273 (36.6%)	6,637 (40.4%)	8,862 (41.2%)	2,747 (34.8%)	3,281 (36.9%)	4,237 (41.0%)	1,258 (39.1%)

Score 1 – not troubled by breathlessness or strenuous exercise

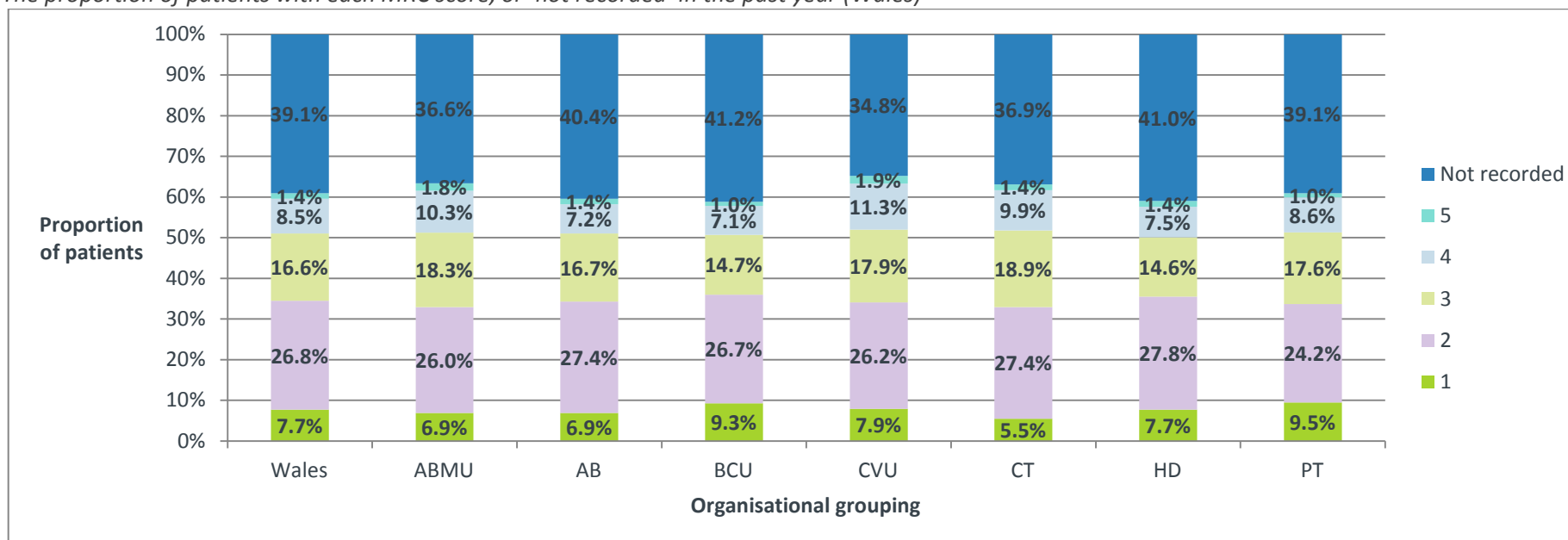
Score 2 – short of breath when hurrying or walking up a slight hill

Score 3 – walks slower than contemporaries on level ground because of breathlessness or has to stop for breath

Score 4 – stops to breathe after walking 100 m (109 yards) or after a few minutes walking on level ground

Score 5 – too breathless to leave the house or breathless when dressing or undressing

The proportion of patients with each MRC score, or 'not recorded' in the past year (Wales)



### 3.2 The proportion of people with COPD who have a measure of FEV1 %-predicted value recorded in the past year

**Rationale for inclusion:**

**NICE CG101 COPD:** There is no specific recommendation to measure annually, but treatment thresholds for PR, inhaled therapies and assessment for oxygen are determined by FEV1 %-predicted and the subsequent classification of severity.

Breathlessness and airflow limitation in COPD worsen over time, but classically in a pattern of slow decline.<sup>31</sup> The annual review can also use sudden changes in breathlessness or marked worsening of FEV1 as an indicator that another cause of breathlessness may now be present. The natural decline in FEV1 annually would usually be considerably <40 mL. Where the decline is greater, a reassessment of breathlessness cause should be considered.<sup>21</sup>

This result is not comparable with those in the 2014–15 audit. In the previous cycle, ‘any latest’ code (ie as opposed to codes recorded in the past year) from the Read family spirometry codes was extracted. This was an unanticipated limitation to the data that were collected on that occasion.

	Wales N=82,696	ABMU N=14,395	AB N=16,428	BCU N=21,511	CVU N=7,892	CT N=8,904	HD N=10,348	PT N=3,218
FEV1 %-predicted value in last year	22,756 (27.5%)	3,544 (24.6%)	5,230 (31.8%)	6,935 (32.2%)	1,634 (20.7%)	2,440 (27.4%)	2,131 (20.6%)	842 (26.2%)

### 3.3 The proportion and status of people with COPD who were asked about tobacco smoking in the past year

**Rationale for inclusion:**

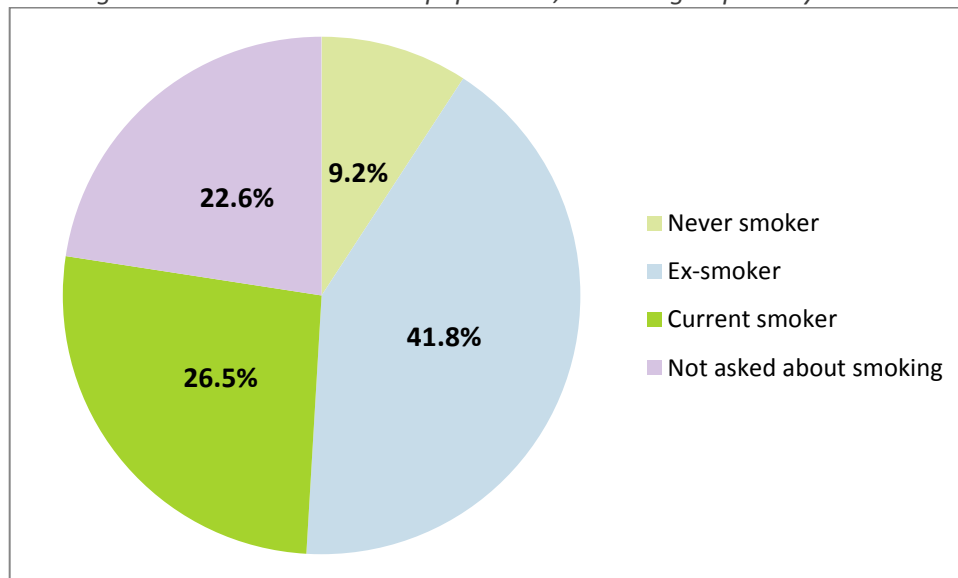
**NICE QS43 – Smoking: supporting people to stop<sup>26</sup> quality statement 1 (linked to NICE QS10):** *People are asked if they smoke by their healthcare practitioner, and those who smoke are offered advice on how to stop.*

Tobacco smoking is the cause of COPD in the vast majority of people. Stopping smoking reduces the rate of decline of lung function and reduces exacerbations. Other treatments for COPD work better if tobacco use has ceased.<sup>32,33</sup>

The latest ever recorded smoking status codes were extracted in the 2014–15 audit, whereas only codes recorded in the past year (ie 15 months) were analysed for this audit. This is because tobacco dependency is a relapsing condition and therefore requires regular review.<sup>34</sup>

Smoking status	Wales N=82,696	ABMU N=14,395	AB N=16,428	BCU N=21,511	CVU N=7,892	CT N=8,904	HD N=10,348	PT N=3,218
Never smoker	7,574 (9.2%)	1,239 (8.6%)	1,678 (10.2%)	1,704 (7.9%)	554 (7.0%)	952 (10.7%)	1,118 (10.8%)	329 (10.2%)
Ex-smoker	34,551 (41.8%)	6,240 (43.4%)	6,746 (41.1%)	8,354 (38.8%)	3,508 (44.5%)	3,894 (43.7%)	4,422 (42.7%)	1,387 (43.1%)
Current smoker	21,924 (26.5%)	4,017 (27.9%)	4,651 (28.3%)	5,273 (24.5%)	2,287 (29.0%)	2,482 (27.9%)	2,476 (23.9%)	738 (22.9%)
Not asked about smoking	18,647 (22.6%)	2,899 (20.1%)	3,353 (20.4%)	6,180 (28.7%)	1,543 (19.6%)	1,576 (17.7%)	2,332 (22.5%)	764 (23.7%)

Smoking status in the Wales COPD population, according to primary care records



### 3.4 Exacerbation count in the past year

*Rationale for inclusion:*

**NICE CG101 COPD:** *A more comprehensive assessment of severity includes ... the frequency of exacerbations ...* The guideline also advises on treatment thresholds for PR, self-management planning and inhaled therapies according to exacerbation frequency.

Exacerbations accelerate the decline of COPD, impair quality of life during the episode and, if left untreated, can result in hospitalisation and increase risk of death.<sup>35,36,37</sup> Recovery can be prolonged, during which time the patient and carer will need additional physical and psychosocial support. Recognising and recording exacerbations should be a key element of risk stratification in a general practice COPD population.

The learning from the first extraction was that exacerbation Read codes (eg 66Yf) are not reliably used. Therefore, in order to ensure that we were able to provide a more comprehensive and accurate breakdown of exacerbation rates at a population level, we have used a validated modelling method with high reliability.<sup>2,5,6,7</sup> LRTI codes and concurrent respiratory antibiotic and oral prednisolone codes are used in this model (for more information, please refer to the methodology in [Appendix C](#)). An analysis solely using extracted exacerbation Read codes is also presented, for comparative purposes (see [3.4.2](#)).

### 3.4.1 Exacerbation count in the past year – using validated method<sup>f</sup>

For a fuller explanation of the methodology used for this analysis, please refer to the methodology in appendix C. Due to absent LRTI codes from some practices, there is a slightly lower COPD population denominator for this measure.<sup>g</sup>

<i>Number of exacerbations</i>	<b>Wales N=82,133</b>	<b>ABMU N=14,177</b>	<b>AB N=16,428</b>	<b>BCU N=21,511</b>	<b>CVU N=7,547</b>	<b>CT N=8,904</b>	<b>HD N=10,348</b>	<b>PT N=3,218</b>
<b>0</b>	<b>47,724 (58.1%)</b>	8,265 (58.3%)	9,104 (55.4%)	12,784 (59.4%)	4,271 (56.6%)	4,728 (53.1%)	6,488 (62.7%)	2,084 (64.8%)
<b>1</b>	<b>15,017 (18.3%)</b>	2,666 (18.8%)	2,974 (18.1%)	3,783 (17.6%)	1,478 (19.6%)	1,694 (19.0%)	1,867 (18.0%)	555 (17.3%)
<b>2</b>	<b>7,412 (9.0%)</b>	1,230(8.7%)	1,502 (9.1%)	1,917 (8.9%)	749 (9.9%)	877 (9.9%)	879 (8.5%)	258 (8.0%)
<b>&gt;2</b>	<b>11,980 (14.6%)</b>	2,016 (14.2%)	2,848 (17.3%)	3,027 (14.1%)	1,049 (13.9%)	1,605 (18.0%)	1,114 (10.8%)	321 (10.0%)

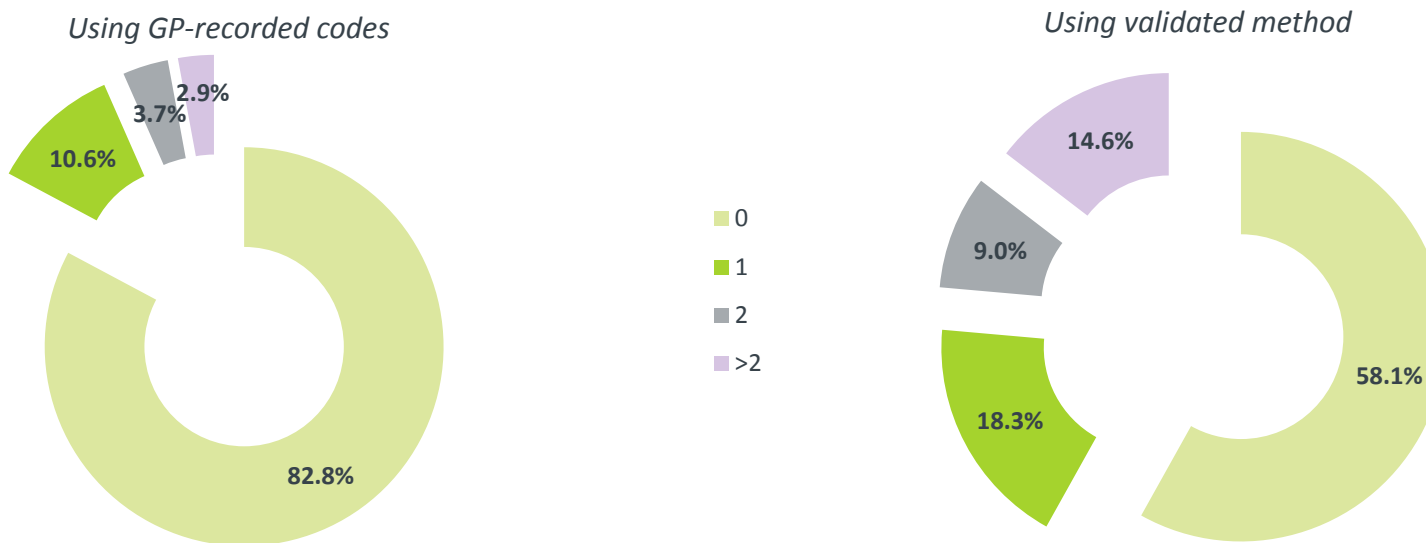
<sup>f</sup> Using LRTI, exacerbation, and prescription codes.

<sup>g</sup> This is due to several practices closing partway through the extraction period.

### 3.4.2 Exacerbation count in the past year – using GP-recorded exacerbation codes

Number of exacerbations	Wales N=82,696	ABMU N=14,395	AB N=16,428	BCU N=21,511	CVU N=7,892	CT N=8,904	HD N=10,348	PT N=3,218
0	<b>68,458 (82.8%)</b>	12,369 (85.9%)	13,239 (80.6%)	17,272 (80.3%)	6,501 (82.4%)	7,279 (81.8%)	9,122 (88.2%)	2,676 (83.2%)
1	<b>8,793 (10.6%)</b>	1,256 (8.7%)	1,978 (12.0%)	2,501 (11.6%)	867 (11.0%)	997 (11.2%)	803 (7.8%)	391 (12.2%)
2	<b>3,064 (3.7%)</b>	426 (3.0%)	693 (4.2%)	971 (4.5%)	290 (3.7%)	342 (3.8%)	255 (2.5%)	87 (2.7%)
>2	<b>2,381 (2.9%)</b>	344 (2.4%)	518 (3.2%)	767 (3.6%)	234 (3.0%)	286 (3.2%)	168 (1.6%)	64 (2.0%)

Exacerbation count in the past year in Wales





### 3.5 Oxygen: management and treatment

#### *Rationale for inclusion:*

**NICE QS10 – Quality statement 3:** *People with stable COPD and a persistent resting stable oxygen saturation level of 92% or less have their arterial blood gases measured to assess whether they need long-term oxygen therapy.*

This is a new query for this audit. In 2014–15, practices were incentivised through QOF to complete annual finger pulse oximetry for people with MRC breathlessness scores of 3 or more.<sup>25</sup> As the metric was so well recorded and achieved, it was decided by the primary care workstream group that the next step in QI would be to ensure that those with low saturations were receiving appropriate assessment for long-term oxygen therapy. Good clinical practice would expect referral after two recordings of pulse oximetry <92% when the patient is stable.<sup>38,39</sup> However, this denominator includes those patients with one low reading, as repeated readings were rare. This suggests that there is a QI opportunity around ensuring that any person with COPD and low oxygen saturations has a follow-up check of their saturations within 3 months (ie rather than relying on just one reading).

Wales	ABMU	AB	BCU	CVU	CT	HD	PT
<b>People with stable COPD and a persistent resting stable oxygen saturation level of 92% or less in the last 2 years who have evidence of an arterial blood gas measurement or referral for home oxygen assessment</b>							
<b>N=6,734</b> 747 (11.1%)	<b>N=1,118</b> 145 (13.0%)	<b>N=1,438</b> 152 (10.6%)	<b>N=1,863</b> 190 (10.2%)	<b>N=536</b> 29 (5.4%)	<b>N=598</b> 83 (13.9%)	<b>N=788</b> 116 (14.7%)	<b>N=393</b> 32 (8.1%)
<b>People with COPD who have a record of oxygen therapy in the past 6 months</b>							
<b>N=82,696</b> 639 (0.8%)	<b>N=14,395</b> 129 (0.9%)	<b>N=16,428</b> 117 (0.7%)	<b>N=21,511</b> 96 (0.5%)	<b>N=7,892</b> 28 (0.4%)	<b>N=8,904</b> 81 (0.9%)	<b>N=10,348</b> 164 (1.6%)	<b>N=3,218</b> 24 (0.8%)



## Section 4: Providing high-value care

[Back to contents](#)

### Key findings

- Proper use of an inhaler ensures that the patient receives their medication in the way it should be delivered. The rates of critical error across devices vary between 14% and 92%,<sup>40</sup> which implies a high incidence of potential waste, and also low-value treatment being received by the patient. NICE quality standards recommend that people with an inhaler should have their technique checked *regularly*.<sup>23</sup>
  - 35,572 or **46.9%** of patients who were prescribed an inhaler had their **inhaler technique checked in the past year**.
- Flu vaccination is the highest-value intervention for the treatment of COPD.<sup>41</sup> According to NICE guidelines, all patients with COPD should be offered an annual flu vaccination.<sup>22</sup>
  - However, **34.0% of this cohort had not received a flu vaccination** between 1 August 2016 and 31 March 2017.
- Of the **current smokers** in the audit cohort, **12.5%** had a record of having received/been referred to a behavioural change intervention **and** prescribed smoking cessation pharmacotherapy in the past 2 years. Smoking cessation reduces the decline of lung function and exacerbation rates, enhances other COPD therapeutic options and has a positive impact on comorbidities.
- NICE quality standards recommend that all COPD patients with an MRC score of 3–5 be referred for PR.<sup>22</sup>
  - Overall, **50.2% of patients with an MRC score of 3–5** had a record of a PR referral in the past 3 years.
  - This was reduced to **21.2%** of patients when patients with *any* MRC score (please note that MRC score 2 referrals, in particular, are increasingly common)<sup>42,43</sup> were included in the denominator.
- **73.5%** of people who were issued an inhaler prescription in the last 6 months of the audit received an **inhaled corticosteroid (ICS)** prescription. This included:
  - **8.1%** who received a prescription for **ICS alone** (this is not indicated in COPD);
  - 29.5% who received a prescription for a long-acting beta-adrenoceptor agonist (LABA) and ICS combination therapy;
  - 35.9% who received a **triple therapy prescription** (LABA + ICS + long-acting muscarinic antagonist (LAMA)).

## Navigation

This section contains the following tables. If viewing this report on a computer, you can select the table that you wish to see from the list below.

- [4.1 People with COPD who are prescribed an inhaler who have evidence of an inhaler technique check in the past year](#)
- [4.2 The proportion of patients with COPD who have had the influenza immunisation in the preceding 1 August – 31 March](#)
- [4.3 The proportion of people with COPD who were recorded as a current smoker at any time in the past 2 years who have received or had a referral to a behavioural change intervention \(BCI\) and had a stop smoking drug prescribed](#)
- [4.4 Pulmonary rehabilitation \(PR\)](#)
  - [4.4.1 Proportion of people with COPD with MRC scores 3–5 who have been referred to PR in the past 3 years](#)
  - [4.4.2 Proportion of people with COPD who are breathless \(any MRC score\) and have been referred to PR in the past 3 years](#)
- [4.5 Use of inhaled therapies in the last 6 months of the audit period](#)
  - [4.5.1 Patients issued a prescription for inhaled therapy in the last 6 months of the audit period](#)
  - [4.5.2 Types of inhaled therapy prescribed to patients in the last 6 months of the audit period](#)

### 4.1 People with COPD who are prescribed an inhaler who have evidence of an inhaler technique check in the past year

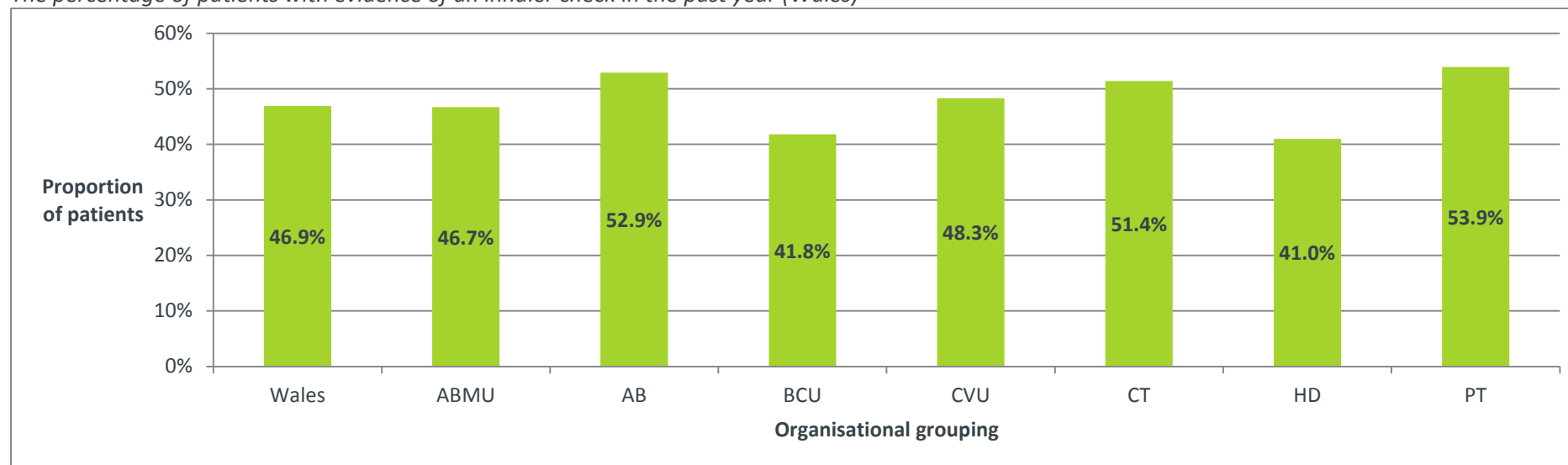
#### *Rationale for inclusion:*

**NICE QS10 – Quality statement 2:** *People with COPD who are prescribed an inhaler have their inhaler technique assessed when starting treatment and then regularly during treatment.*

The denominator for this analysis is any patient with an inhaler prescription, and is lower than the total population by 6,773 or 8.2%. While inappropriate use, overuse and waste often predominate in discussions about inhaled pharmacotherapy in COPD, this denominator difference suggests a potential issue with underuse (or lack of recording) and practices; clusters and health boards may want to consider local data further to understand this.

	Wales N=75,923	ABMU N=13,310	AB N=14,703	BCU N=19,971	CVU N=7,290	CT N=8,320	HD N=9,392	PT N=2,937
Inhaler check in the past year	35,572 (46.9%)	6,209 (46.7%)	7,776 (52.9%)	8,352 (41.8%)	3,522 (48.3%)	4,279 (51.4%)	3,852 (41.0%)	1,582 (53.9%)

The percentage of patients with evidence of an inhaler check in the past year (Wales)



#### 4.2 The proportion of patients with COPD who have had the influenza immunisation in the preceding 1 August – 31 March

##### **Rationale for inclusion:**

**NICE CG101 COPD:** *Pneumococcal vaccination and an annual influenza vaccination should be offered to all patients with COPD as recommended by the chief medical officer.*

People with chronic respiratory illness who are infected with the influenza virus have more serious illness and are at higher risk of mortality.<sup>44</sup> Despite the fact that the vaccine has variable effectiveness according to season and current health status when given, it is safe and the highest-value intervention for the treatment of COPD.<sup>41</sup> However, it is used less than some other COPD interventions that have lower value.

A comparison cannot be made with the 2014/15 audit, owing to changes in denominator. The results below use a denominator of ‘all people with COPD’ and do not exclude those with exception codes. This is because the Wales QOF no longer provides flu vaccination figures for people on COPD registers. However, QOF data about flu vaccinations in patients over 65 years of age show that 20% of the population were exception reported. In addition, for people with long-term conditions under the age of 65, 29% were exception reported.<sup>45</sup>

	Wales N=82,696	ABMU N=14,395	AB N=16,428	BCU N=21,511	CVU N=7,892	CT N=8,904	HD N=10,348	PT N=3,218
Influenza immunisation received	54,602 (66.0%)	9,273 (64.4%)	10,879 (66.2%)	14,111 (65.6%)	5,435 (68.9%)	6,036 (67.8%)	6,773 (65.5%)	2,095 (65.1%)

#### 4.3 The proportion of people with COPD who were recorded as a current smoker at any time in the past 2 years who have received or had a referral to a behavioural change intervention (BCI) and had a stop smoking drug prescribed

##### *Rationale for inclusion:*

NICE QS10 is linked to QS43 – Smoking: supporting people to stop:

- NICE QS43 – Quality statement 2: *People who smoke are offered a referral to an evidence-based smoking cessation service.*
- NICE QS43 – Quality statement 3: *People who smoke are offered behavioural support with pharmacotherapy by an evidence-based smoking cessation service.*
- NICE QS43 – Quality statement 4: *People who seek support to stop smoking and who agree to take pharmacotherapy are offered a full course.*
- NICE QS43 – Quality statement 5: *People who smoke who have set a quit date with an evidence-based smoking cessation service are assessed for carbon monoxide levels 4 weeks after the quit date.*

This question looks at a cohort of self-reported smokers. Tobacco dependency is known to relapse, so reassessing smoking status and offering therapy should happen in those with tobacco smoking histories and especially those who have relapsed in recent years. Therefore, people who had combinations of any non-smoker and current smoker codes in the past 2 years were included in the denominator for analysis (ie in addition to those who simply had current smoker codes recorded). The best way of treating tobacco dependency is with a combination of behavioural therapy and drug therapy, and so codes for both elements of care needed to be present to be included in the numerator.<sup>46,47</sup>

	Wales N=35,045	ABMU N=6,152	AB N=7,292	BCU N=9,117	CVU N=3,481	CT N=3,591	HD N=4,012	PT N=1,400
Current smokers who received BCI referral / smoking-cessation pharmacotherapy	4,383 (12.5%)	467 (7.6%)	1,013 (13.9%)	1,168 (12.8%)	711 (20.4%)	353 (9.8%)	479 (11.9%)	192 (13.7%)

## 4.4 Pulmonary rehabilitation (PR)

### Rationale for inclusion:

**NICE QS10 – Quality statement 4:** *People with stable COPD and exercise limitation due to breathlessness are referred to a PR programme.*

#### 4.4.1 Proportion of people with COPD with MRC scores 3–5 who have been referred to PR in the past 3 years

The denominator used in the 2014–15 audit was patients on the COPD register with MRC breathlessness scores 3, 4 and 5, with the numerator being those ‘ever’ referred to PR. For the 2015–17 audit, we narrowed this to patients with MRC scores 3–5 (which is still the criterion in Welsh QOF<sup>45</sup>) referred to PR in **the past 3 years** (excluding those who were exception reported), as it was agreed that it would be best practice to re-offer PR to patients at least every 3 years (as those who previously declined may subsequently accept). There may also be progression of breathlessness moving them from non-eligible to eligible for the treatment.

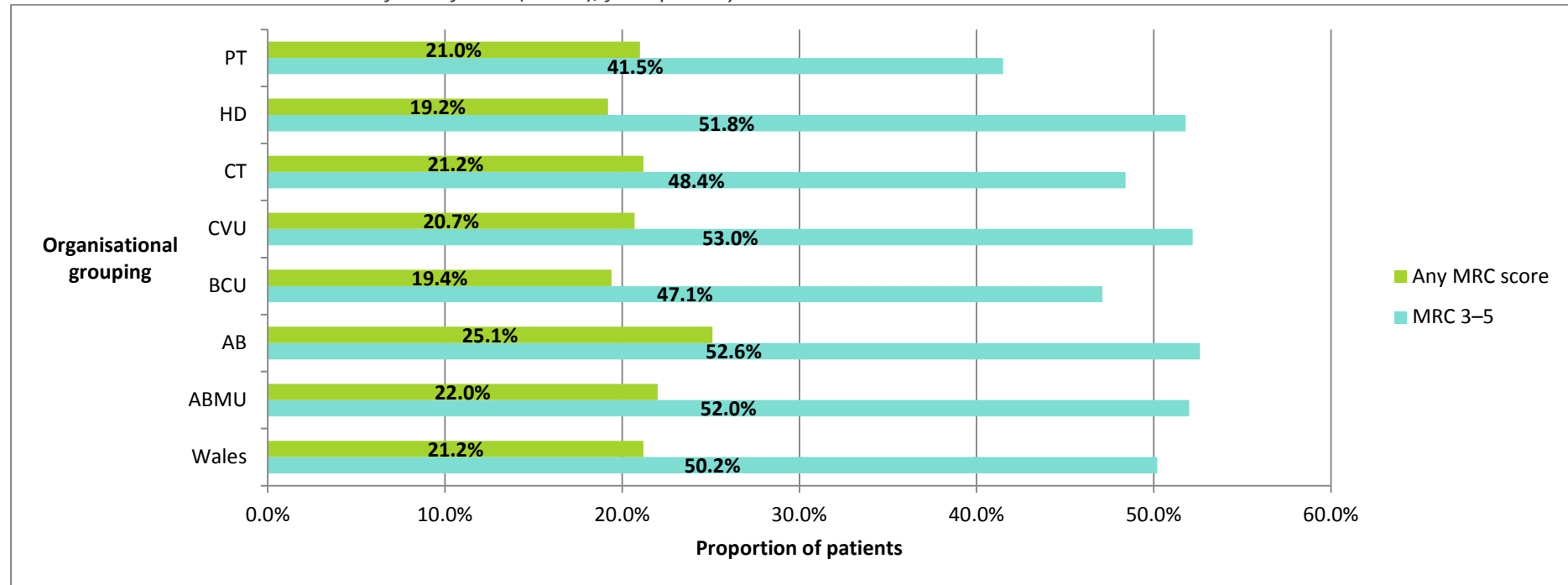
	Wales N=15,190	ABMU N=2,825	AB N=3,013	BCU N=4,120	CVU N=1,339	CT N=1,485	HD N=1,912	PT N=496
<b>MRC score 3–5 and referred for PR</b>	<b>7,621 (50.2%)</b>	1,470 (52.0%)	1,586 (52.6%)	1,942 (47.1%)	709 (53.0%)	718 (48.4%)	990 (51.8%)	206 (41.5%)

#### 4.4.2 Proportion of people with COPD who are breathless (any MRC score) and have been referred to PR in the past 3 years

In addition, we performed an analysis which expanded the denominator to include those patients with **any MRC score** (but to exclude those without an MRC score and who were exception reported) referred to PR in the past 3 years, as feedback suggested that we include referrals for patients with MRC 2 (in particular), which is common practice in many units.

	Wales N=47,974	ABMU N=8,409	AB N=8,816	BCU N=13,571	CVU N=4,296	CT N=4,512	HD N=6,728	PT N=1,642
<b>Any MRC score and referred to PR</b>	<b>10,179 (21.2%)</b>	1,850 (22.0%)	2,215 (25.1%)	2,633 (19.4%)	889 (20.7%)	956 (21.2%)	1,291 (19.2%)	345 (21.0%)

Patients with COPD who have been referred for PR (Wales), from primary care records



#### 4.5 Use of inhaled therapies in the last 6 months of the audit period

##### *Rationale for inclusion:*

##### NICE CG101 COPD<sup>22</sup>

- In people with stable COPD who remain breathless or have exacerbations despite use of short-acting bronchodilators as required, offer the following as maintenance therapy: if FEV1  $\geq$ 50% predicted: either LABA or LAMA; if FEV1 <50% predicted: either LABA with an ICS in a combination inhaler, or LAMA.
- Offer LAMA in addition to LABA + ICS to people with COPD who remain breathless or have exacerbations despite taking LABA + ICS, irrespective of their FEV1.



- *In people with stable COPD and an FEV1 ≥50% who remain breathless or have exacerbations despite maintenance therapy with a LABA: consider LABA + ICS in a combination inhaler; consider LAMA in addition to LABA where ICS is declined or not tolerated.*
- *Offer LAMA in addition to LABA + ICS to people with COPD who remain breathless or have exacerbations despite taking LABA + ICS, irrespective of their FEV1.*
- *Consider LABA + ICS in a combination inhaler in addition to LAMA for people with stable COPD who remain breathless or have exacerbations despite maintenance therapy with LAMA, irrespective of their FEV1.*
- *The choice of drug(s) should take into account the person’s symptomatic response and preference, and the drug’s potential to reduce exacerbations, its side effects and cost.*

Inhaled pharmacotherapy, when prescribed and dispensed according to guidelines and when used appropriately, can prevent exacerbations, ease breathlessness, allow people to be more active and improve quality of life.<sup>22</sup> **Error! Bookmark not defined.** Peer-reviewed reports and the first cycle of this audit, however, still show that there is some overuse and misuse of inhaled pharmacotherapy.<sup>1,48,49,50</sup>

This audit has reported on the metrics that should be used to help clinicians choose and prescribe inhalers responsibly, ie annual smoking status, functional breathlessness, airflow limitation and exacerbation counts. Below we report on prescribing patterns in the last 6 months of the 16–17 financial year, including LAMA/LABA prescriptions, as these are beginning to be approved by medicines optimisation teams in local formularies.<sup>51,52</sup>

It appears from our results that there is still work to do to ensure that people with COPD receive personalised inhaled pharmacotherapy, and medicines optimisations teams, clusters and health boards should consider looking carefully at this section and utilising these metrics into the near future to track improvements.

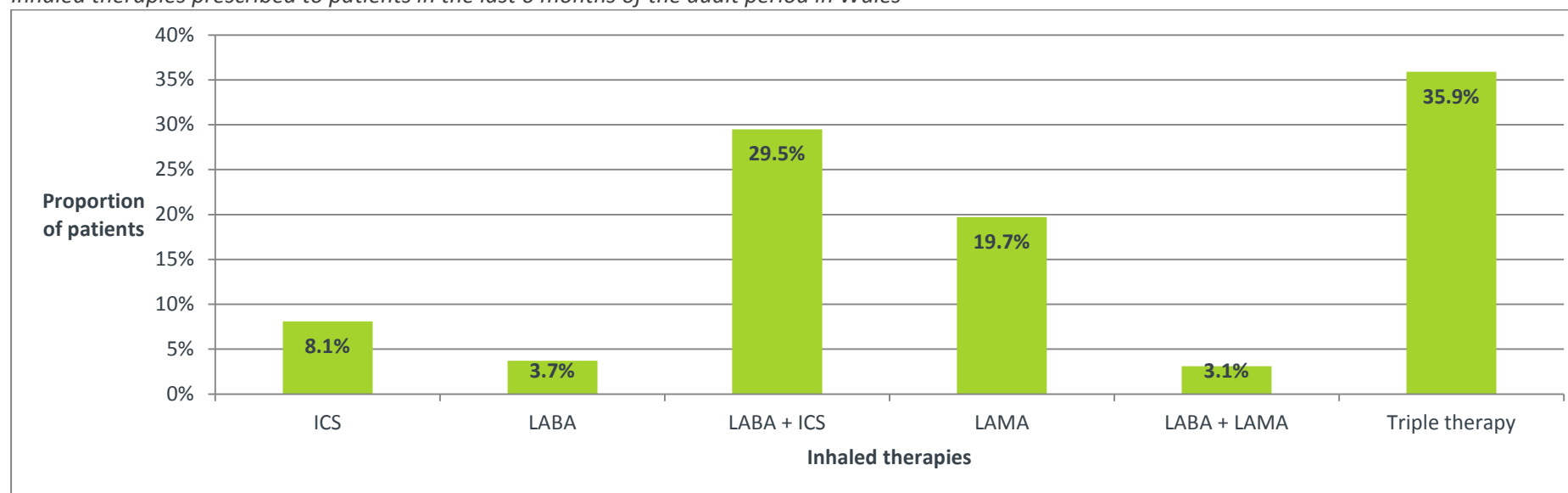
#### 4.5.1 Patients issued a prescription for inhaled therapy in the last 6 months of the audit period

	Wales	ABMU	AB	BCU	CVU	CT	HD	PT
<b>Patients on inhaled therapy</b>	<b>55,434 (67.0%)</b>	9,822 (68.2%)	10,364 (63.1%)	14,312 (66.5%)	5,662 (71.7%)	6,563 (73.7%)	6,580 (63.6%)	2,131 (66.2%)

#### 4.5.2 Types of inhaled therapy prescribed to patients in the last 6 months of the audit period

Inhaled therapy	Wales N=55,434	ABMU N=9,822	AB N=10,364	BCU N=14,312	CVU N=5,662	CT N=6,563	HD N=6,580	PT N=2,131
ICS	4,493 (8.1%)	717 (7.3%)	679 (6.6%)	1,377 (9.6%)	372 (6.6%)	436 (6.6%)	701 (10.7%)	211 (9.9%)
LABA	2,075 (3.7%)	353 (3.6%)	567 (5.5%)	658 (4.6%)	205 (3.6%)	132 (2.0%)	122 (1.9%)	38 (1.8%)
LABA + ICS	16,351 (29.5%)	2,241 (22.8%)	4,261 (41.1%)	3,866 (27.0%)	1,330 (23.5%)	1,412 (21.5%)	2,510 (38.2%)	731 (34.3%)
LAMA	10,899 (19.7%)	2,774 (28.2%)	1,499 (14.5%)	2,636 (18.4%)	1,085 (19.2%)	1,403 (21.4%)	1,146 (17.4%)	356 (16.7%)
LABA + LAMA	1,699 (3.1%)	295 (3.0%)	322 (3.1%)	569 (4.0%)	227 (4.0%)	128 (2.0%)	120 (1.8%)	38 (1.8%)
Triple therapy	19,917 (35.9%)	3,442 (35.0%)	3,036 (29.3%)	5,206 (36.4%)	2,443 (43.2%)	3,052 (46.5%)	1,981 (30.1%)	757 (35.5%)

Inhaled therapies prescribed to patients in the last 6 months of the audit period in Wales





## Section 5: Ensuring equal and equitable care

[Back to contents](#)

*Do people with serious mental illness (SMI), who currently smoke, or who are from a lower socioeconomic group get less access to quality diagnosis, management and treatment?*

**Rationale for inclusion:**

*Doing well, doing better. Standards for health services in Wales.*<sup>53</sup>

**Standard 2: Equality, diversity and human rights**

*Organisations and services have equality priorities in accordance with legislation, which ensure that they recognise and address the:*

- *needs of individuals whatever their identity and background, and uphold their human rights;*
- *need to challenge discrimination, promote equality and human rights and seek to reduce health inequities through their strategies, policies, practices and procurement processes.*

### Navigation

*This section contains three sections. If viewing this report on a computer, you can select the table that you wish to see from the list below.*

- [5.1 Patients with serious mental illness](#)
- [5.2 Patients who currently smoke](#)
- [5.3 Patients from a lower socioeconomic group](#)



### 5.1 Patients with serious mental illness (SMI)

[Back to contents](#)

#### Key findings

- People with **SMI** (relative to those without) were:
  - **25% less likely** (odds ratio (OR): 0.75 (95% confidence interval (CI): 0.71–0.79)) to have an **MRC score recorded** in the past year.
  - **27% less likely** (OR: 0.73 (95% CI: 0.69–0.77)) to have received **influenza immunisation** in the preceding 1 August – 31 March.
  - **28% more likely** (OR: 1.28 (95% CI: 1.16–1.42)) to have received or had a referral to a **behavioural change intervention** and had a stop smoking drug prescribed if they were a current smoker.
  - **19% less likely** (OR: 0.81 (95% CI: 0.72 to 0.91)) to have been **referred to PR** in the past 3 years if they had an MRC score of 3–5.

## Navigation

This section contains the following tables. If viewing this report on a computer, you can select the table that you wish to see from the list below.

- **5.1 Patients with serious mental illness**
  - **5.1.1 The percentage of people diagnosed with COPD in the past two years who have a post-bronchodilator FEV1/FVC (latest ever recorded) <0.7 (consistent with airways obstruction)**
  - **5.1.2 The percentage of people with COPD who had a chest X-ray or CT scan 6 months prior to diagnosis or within 6 months of diagnosis (ie when COPD code first added to disease register)**
  - **5.1.3 The proportion of people with COPD with MRC scores recorded in the past year**
  - **5.1.4 The proportion of people with COPD who have a measure of FEV1 %-predicted value recorded in the past year**
  - **5.1.5 The proportion and status of people with COPD who were asked about tobacco smoking in the past year**
  - **5.1.6 Exacerbation count in the past year – using validated method**
  - **5.1.7 The proportion of patients with COPD who have had the influenza immunisation in the preceding 1 August – 31 March**
  - **5.1.8 The proportion of people with COPD who were recorded as a current smoker at any time in the past 2 years who have received or had a referral to a behavioural change intervention and had a stop smoking drug prescribed**
  - **5.1.9 Proportion of people with COPD who are breathless (any MRC score) and have been referred to PR in the past 3 years**
  - **5.1.10 Proportion of people with COPD with MRC scores 3–5 and have been referred to PR in the past 3 years**

### 5.1 Patients with serious mental illness (SMI)

	Non-SMI	SMI
Wales (N= 82,696)	N=76,248 (92.2%)	N=6,448 (7.8%)
ABMU (N=14,395)	N=13,303 (92.4%)	N=1,092 (7.6%)
AB (N=16,428)	N=15,030 (91.5%)	N=1,398 (8.5%)
BCU (N=21,511)	N=19,986 (93.0%)	N=1,525 (7.0%)
CVU (N=7,892)	N=7,106 (90.0%)	N=786 (10.0%)
CT (N=8,904)	N=8,238 (92.5%)	N=666 (7.5%)
HD (N=10,348)	N=9,538 (92.2%)	N=810 (7.8%)
PT (N=3,218)	N=3,047 (94.7%)	N=171 (5.3%)

**Please note;** all subsequent analyses in this section use these denominators unless otherwise specified and provided. Additionally, where the results are less than five, exact figures and percentages have been suppressed and replaced with '<5', in line with the Office for National Statistics confidentiality guidance.<sup>54</sup>

### 5.1.1 The percentage of people diagnosed with COPD in the past two years who have a post-bronchodilator FEV1/FVC (latest ever recorded) <0.7 (consistent with airways obstruction)

To go to the overall national result for this question, [please click here](#).

	Non-SMI	SMI
<b>Wales</b>	<b>855/10,022 (8.5%)</b>	<b>63/846 (7.5%)</b>
<b>ABMU</b>	120/1,836 (6.5%)	10/187 (5.4%)
<b>AB</b>	242/1,945 (12.4%)	20/195 (10.3%)
<b>BCU</b>	94/2,476 (3.8%)	<5/156
<b>CVU</b>	147/1,072 (13.7%)	8/91 (8.8%)
<b>CT</b>	179/1,030 (17.4%)	12/87 (13.8%)
<b>HD</b>	63/1,304 (4.8%)	9/114 (7.9%)
<b>PT</b>	10/359 (2.8%)	<5/16

### 5.1.2 The percentage of people with COPD who had a chest X-ray or CT scan 6 months prior to diagnosis or within 6 months of diagnosis (ie when COPD code first added to disease register)

To go to the overall national result for this question, [please click here](#).

	Non-SMI	SMI
<b>Wales</b>	<b>3,970/10,022 (39.6%)</b>	<b>330/846 (39.0%)</b>
<b>ABMU</b>	825/1,836 (44.9%)	74/187 (39.6%)
<b>AB</b>	605/1,945 (31.1%)	63/195 (32.3%)
<b>BCU</b>	940/2,476 (38.0%)	63/156 (40.4%)
<b>CVU</b>	463/1,072 (43.2%)	45/91 (49.5%)
<b>CT</b>	402/1,030 (39.0%)	27/87 (31.0%)
<b>HD</b>	578/1,304 (44.3%)	52/114 (45.6%)
<b>PT</b>	157/359 (43.7%)	6/16 (37.5%)

### 5.1.3 The proportion of people with COPD with MRC scores recorded in the past year

To go to the overall national result and MRC scores, [please click here](#).

The recording of breathlessness, and its severity, is integral to ensuring that all patients receive the most appropriate and suitable care and interventions.

		Non-SMI	SMI
<b>Wales</b>	<b>Recorded</b>	<b>46,891 (61.5%)</b>	<b>3,510 (54.4%)</b>
	<b>Not recorded</b>	<b>28,357 (38.5%)</b>	<b>2,938 (45.6%)</b>
<b>ABMU</b>	<b>Recorded</b>	8,471 (63.7%)	651 (59.6%)
	<b>Not recorded</b>	4,832 (36.3%)	441 (40.4%)
<b>AB</b>	<b>Recorded</b>	9,059 (60.3%)	732 (52.4%)
	<b>Not recorded</b>	5,971 (39.7%)	666 (47.6%)
<b>BCU</b>	<b>Recorded</b>	11,908 (59.6%)	741 (48.6%)
	<b>Not recorded</b>	8,078 (40.4%)	784 (51.4%)
<b>CVU</b>	<b>Recorded</b>	4,681 (65.9%)	464 (59.0%)
	<b>Not recorded</b>	2,425 (34.1%)	322 (41.0%)
<b>CT</b>	<b>Recorded</b>	5,230 (63.5%)	393 (59.0%)
	<b>Not recorded</b>	3,008 (36.5%)	273 (41.0%)
<b>HD</b>	<b>Recorded</b>	5,661 (59.4%)	450 (55.6%)
	<b>Not recorded</b>	3,877 (40.7%)	360 (44.4%)
<b>PT</b>	<b>Recorded</b>	1,881 (61.7%)	79 (46.2%)
	<b>Not recorded</b>	1,166 (38.3%)	92 (53.8%)

### 5.1.4 The proportion of people with COPD who have a measure of FEV1 %-predicted value recorded in the past year

To go to the overall national result for this question, [please click here](#).

	Non-SMI	SMI
<b>Wales</b>	<b>21,373 (28.0%)</b>	<b>1,383 (21.5%)</b>
<b>ABMU</b>	3,303 (24.8%)	241 (22.1%)
<b>AB</b>	4,855 (32.3%)	375 (26.8%)
<b>BCU</b>	6,598 (33.0%)	337 (22.1%)
<b>CVU</b>	1,510 (21.3%)	124 (15.8%)
<b>CT</b>	2,274 (27.6%)	166 (24.9%)
<b>HD</b>	2,021 (21.2%)	110 (13.6%)
<b>PT</b>	812 (26.7%)	30 (17.5%)

### 5.1.5 The proportion and status of people with COPD who were asked about tobacco smoking in the past year

To go to the overall national result for this question, [please click here](#).

		Non-SMI	SMI
<b>Wales</b>	Asked about smoking	<b>59,261 (77.7%)</b>	<b>4,788 (74.3%)</b>
	Not asked about smoking	<b>16,987 (22.3%)</b>	<b>1,660 (25.8%)</b>
<b>ABMU</b>	Asked about smoking	10,640 (80.0%)	856 (78.4%)
	Not asked about smoking	2,663 (20.0%)	236 (21.6%)
<b>AB</b>	Asked about smoking	12,015 (79.9%)	1,060 (75.8%)
	Not asked about smoking	3,015 (20.1%)	338 (24.2%)
<b>BCU</b>	Asked about smoking	14,332 (71.7%)	999 (65.5%)
	Not asked about smoking	5,654 (28.3%)	526 (34.5%)
<b>CVU</b>	Asked about smoking	5733 (80.7%)	616 (78.4%)
	Not asked about smoking	1,373 (19.3%)	170 (21.6%)
<b>CT</b>	Asked about smoking	6,795 (82.5%)	533 (80.0%)
	Not asked about smoking	1,443 (17.5%)	133 (20.0%)
<b>HD</b>	Asked about smoking	7,407 (77.7%)	609 (75.2%)
	Not asked about smoking	2,131 (22.3%)	201 (24.8%)
<b>PT</b>	Asked about smoking	2,339 (76.8%)	115 (67.3%)
	Not asked about smoking	708 (23.2%)	56 (32.8%)

### 5.1.6 Exacerbation count in the past year – using validated method

To go to the overall national result for this question, [please click here](#).

	Exacerbation count	Non-SMI	SMI
<b>Wales</b>	<b>0</b>	<b>44,035/75,765 (58.1%)</b>	<b>3,689/6,368 (57.9 %)</b>
	<b>1</b>	<b>13,891/75,765 (18.3%)</b>	<b>1,126/6,368 (17.7%)</b>
	<b>2</b>	<b>6,817/75,765 (9.0%)</b>	<b>595/6,368 (9.3%)</b>
	<b>&gt;2</b>	<b>11,022/75,765 (14.6%)</b>	<b>958/6,368 (15.0%)</b>
<b>ABMU</b>	<b>0</b>	7,655/13,117 (58.4%)	610/1,060 (57.6%)
	<b>1</b>	2,478/13,117 (18.9%)	188/1,060 (17.7%)
	<b>2</b>	1,131/13,117 (8.6%)	99/1,060 (9.3%)
	<b>&gt;2</b>	1,853/13,117 (14.1%)	163/1,060 (15.4%)
	<b>0</b>	8,331/15,030 (55.4%)	773/1,398 (55.3%)

AB	1	2,725/15,030 (18.1%)	249/1,398 (17.8%)
	2	1,371/15,030 (9.1%)	131/1,398 (9.4%)
	>2	2,603/15,030 (17.3%)	245/1,398 (17.5%)
BCU	0	11,884/19,986 (59.5%)	900/1,525 (59.0%)
	1	3,518/19,986 (17.6%)	265/1,525 (17.4%)
	2	1,781/19,986 (8.9%)	136/1,525 (8.9%)
	>2	2,803/19,986 (14.0%)	224/1,525 (14.7%)
CVU	0	3,867/6,809 (56.8%)	404/738 (54.7%)
	1	1,328/6,809 (19.5%)	150/738 (20.3%)
	2	676/6,809 (9.9%)	73/738 (9.9%)
	>2	938/6,809 (13.8%)	111/738 (15.0%)
CT	0	4,361/8,238 (52.9%)	367/666 (55.1%)
	1	1,573/8,238 (19.1%)	121/666 (18.2%)
	2	812/8,238 (9.9%)	65/666 (9.8%)
	>2	1,492/8,238 (18.1%)	113/666 (17.0%)
HD	0	5,980/9,538 (62.7%)	508/810 (62.7%)
	1	1,737/9,538 (18.2%)	130/810 (16.1%)
	2	794/9,538 (8.3%)	85/810 (10.5%)
	>2	1,027/9,538 (10.8%)	87/810 (10.7%)
PT	0	1,957/3,047 (64.2%)	127/171 (74.3%)
	1	532/3,047 (17.5%)	23/171 (13.5%)
	2	252/3,047 (8.3%)	6/171 (3.5%)
	>2	306/3,047 (10.0%)	15/171 (8.8%)

### 5.1.7 The proportion of patients with COPD who have had the influenza immunisation in the preceding 1 August – 31 March

To go to the overall national result for this question, [please click here](#).

	Non-SMI	SMI
<b>Wales</b>	<b>50,776 (66.6%)</b>	<b>3,826 (59.4%)</b>
ABMU	8,657 (65.1%)	616 (56.4%)
AB	10,043 (66.8%)	836 (59.8%)
BCU	13,219 (66.1%)	892 (58.5%)
CVU	4,918 (69.2%)	517 (65.8%)
CT	5,634 (68.4%)	402 (60.4%)
HD	6,300 (66.1%)	473 (58.4%)
PT	2,005 (65.8%)	90 (52.6%)

### 5.1.8 The proportion of people with COPD who were recorded as a current smoker at any time in the past 2 years who have received or had a referral to a behavioural change intervention and had a stop smoking drug prescribed

To go to the overall national result for this question, [please click here](#).

	Non-SMI	SMI
<b>Wales</b>	<b>3,884/31,752 (12.2%)</b>	<b>499/3,293 (15.2%)</b>
ABMU	402/5,552 (7.2%)	65/600 (10.8%)
AB	881/6,564 (13.4%)	132/728 (18.1%)
BCU	1,066/8,385 (12.7%)	102/732 (13.9%)
CVU	612/3,077 (19.9%)	99/404 (24.5%)



CT	314/3,251 (9.7%)	39/340 (11.5%)
HD	428/3,595 (11.9%)	51/417 (12.2%)
PT	181/1,328 (13.6%)	11/72 (15.3%)

### 5.1.9 Proportion of people with COPD who are breathless (any MRC score) and have been referred to PR in the past 3 years

To go to the overall national result for this question, [please click here](#).

	Non-SMI	SMI
Wales	9,383/44,357 (21.2%)	796/3,617 (22.0%)
ABMU	1,721/7,808 (22.0%)	129/601 (21.5%)
AB	2,018/8,087 (25.0%)	197/ 729 (27.0%)
BCU	2,474/12,651 (19.6%)	159/ 920 (17.3%)
CVU	796/3,876 (20.5%)	93/420 (22.1%)
CT	880/4,169 (21.1%)	76/343 (22.2%)
HD	1,160/6,211 (18.7%)	131/517 (25.3%)
PT	334/ 1,555 (21.5%)	11/ 87 (12.6%)

### 5.1.10 Proportion of people with COPD with MRC scores 3–5 and have been referred to PR in the past 3 years

To go to the overall national result for this question, [please click here](#).

	Non-SMI	SMI
Wales	7,023/13,871 (50.6%)	598/1,319 (45.3%)
ABMU	1,358/2,574 (52.8%)	112/251 (44.6%)
AB	1,448/2,742 (52.8%)	138/271 (50.9%)
BCU	1,829/3,808 (48.0%)	113/312 (36.2%)
CVU	637/1,189 (53.8%)	72/150 (53.6%)
CT	661/1,361 (48.6%)	57/124 (46.0%)
HD	890/1,731 (51.4%)	100/181 (55.3%)
PT	200/466 (42.9%)	6/30 (20.0%)



## 5.2. Patients who currently smoke

[Back to contents](#)

### Key findings

- **Current smokers** relative to people who hadn't smoked for at least 4 years were:
  - **31% more likely** (OR: 1.31 (95% CI: 1.12–1.52)) to have a **post-bronchodilator FEV1/FVC <0.7** recorded.
  - **47% less likely** (OR: 0.53 (95% CI: 0.51–0.54)) to have received **influenza immunisation** in the preceding 1 August – 31 March.
  - **10% less likely** (OR: 0.90 (95% CI: 0.85–0.94)) to have been **referred to PR** in the past 3 years if they had any MRC score.

## Navigation

This section contains the following tables. If viewing this report on a computer, you can select the table that you wish to see from the list below.

- **5.2 The number of current smokers and non-smokers**
  - **5.2.1 The percentage of people diagnosed with COPD in the past two years who have a post-bronchodilator FEV1/FVC (latest ever recorded) <0.7 (consistent with airways obstruction)**
  - **5.2.2 The percentage of people with COPD who had a chest X-ray or CT scan 6 months prior to diagnosis or within 6 months of diagnosis (ie when COPD code first added to disease register)**
  - **5.2.3 The proportion of people with COPD with MRC scores recorded in the past year**
  - **5.2.4 The proportion of people with COPD who have a measure of FEV1 %-predicted value recorded in the past year**
  - **5.2.5 The proportion and status of people with COPD who were asked about tobacco smoking in the past year**
  - **5.2.6 Exacerbation count in the past year – using validated method**
  - **5.2.7 The proportion of patients with COPD who have had the influenza immunisation in the preceding 1 August – 31 March**
  - **5.2.8 Proportion of people with COPD who are breathless (any MRC score) and have been referred to PR in the past 3 years**
  - **5.2.9 Proportion of people with COPD with MRC scores 3–5 and have been referred to PR in the past 3 years**

### 5.2 The number of current smokers and non-smokers

	Never smoked	Current smoker
Wales (N=68,365)	N=42,267 (61.8%)	N=26,098 (38.2%)
ABMU (N=12,237)	N=7,578 (61.9%)	N=4,659 (38.1%)
AB (N=13,512)	N=8,036 (59.5%)	N=5,476 (40.5%)
BCU (N=17,419)	N=10,708 (61.5%)	N=6,711 (38.5%)
CVU (N=6,612)	N=3,971 (60.1%)	N=2,641 (39.9%)
CT (N=7,451)	N=4,626 (62.1%)	N=2,825 (37.9%)
HD (N=8,458)	N=5,535 (65.4%)	N=2,923 (35.6%)
PT (N=2,676)	N=1,813 (67.8%)	N=863 (32.2%)

**Please note:** all subsequent analyses in this section use these denominators unless otherwise specified and provided. Additionally, where the results are less than five, exact figures and percentages have been suppressed and replaced with '<5', in line with the Office for National Statistics confidentiality guidance.<sup>54</sup>

#### 5.2.1 The percentage of people diagnosed with COPD in the past two years who have a post-bronchodilator FEV1/FVC (latest ever recorded) <0.7 (consistent with airways obstruction)

To go to the overall national result for this question, [please click here](#).

	Never smoked	Current smoker
Wales	319/4,317 (7.4%)	421/4,451 (9.5%)
ABMU	42/822 (5.1%)	65/858 (7.6%)

AB	89/839 (10.6%)	121/913 (13.3%)
BCU	44/961 (4.6%)	39/1,105 (3.5%)
CVU	55/457 (12.0%)	71/471 (15.1%)
CT	62/392 (15.8%)	93/489 (19.0%)
HD	22/672 (3.3%)	31/487 (6.4%)
PT	5/174 (2.9%)	<5/128

### 5.2.2 The percentage of people with COPD who had a chest X-ray or CT scan 6 months prior to diagnosis or within 6 months of diagnosis (ie when COPD code first added to disease register)

To go to the overall national result for this question, [please click here](#).

	Never smoked	Current smoker
Wales	1,686/4,317 (39.1%)	1,739/4,451 (39.1%)
ABMU	358/822 (43.6%)	384/858 (44.8%)
AB	238/839 (28.4%)	285/913 (31.2%)
BCU	383/961 (39.9%)	385/1,105 (34.8%)
CVU	190/457 (41.6%)	210/471 (44.6%)
CT	148/392 (37.8%)	185/489 (37.8%)
HD	296/672 (44.1%)	231/487 (47.4%)
PT	73/174 (42.0%)	59/128 (46.1%)

### 5.2.3 The proportion of people with COPD with MRC scores recorded in the past year

To go to the overall national result and MRC scores, [please click here](#).

The recording of breathlessness, and its severity, is integral to ensuring that all patients receive the most appropriate and suitable care and interventions.

		Never smoked	Current smoker
Wales	Recorded	25,570 (60.5%)	16,430 (63.0%)
	Not recorded	16,697 (39.5%)	9,668 (37.0%)
ABMU	Recorded	4,788 (63.2%)	3,052 (65.5%)
	Not recorded	2,790 (36.8%)	1,607 (34.5%)
AB	Recorded	4,619 (57.5%)	3,432 (62.7%)
	Not recorded	3,417 (42.5%)	2,044 (37.3%)
BCU	Recorded	6,377 (59.6%)	3,994 (59.5%)
	Not recorded	4,331 (40.5%)	2,717 (40.5%)
CVU	Recorded	2,610 (65.7%)	1,727 (65.4%)
	Not recorded	1,361 (34.3%)	914 (34.6%)
CT	Recorded	2,827 (61.1%)	1,882 (66.6%)
	Not recorded	1,799 (38.9%)	943 (33.4%)
HD	Recorded	3,283 (59.3%)	1,758 (60.1%)
	Not recorded	2,252 (40.7%)	1,165 (39.9%)
PT	Recorded	1,066 (58.8%)	585 (67.8%)
	Not recorded	747 (41.2%)	278 (32.2%)

### 5.2.4 The proportion of people with COPD who have a measure of FEV1 %-predicted value recorded in the past year

To go to the overall national result for this question, [please click here](#).

	Never smoked	Current smoker
<b>Wales</b>	<b>10,971 (26.0%)</b>	<b>7,667 (29.4%)</b>
<b>ABMU</b>	1,773 (23.4%)	1,262 (27.1%)
<b>AB</b>	2,362 (29.4%)	1,828 (33.4%)
<b>BCU</b>	3,377 (31.5%)	2,242 (33.4%)
<b>CVU</b>	746 (18.8%)	601 (22.8%)
<b>CT</b>	1,184 (25.6%)	846 (30.0%)
<b>HD</b>	1,081 (19.5%)	635 (21.7%)
<b>PT</b>	448 (24.7%)	253 (29.3%)

### 5.2.5 The proportion and status of people with COPD who were asked about tobacco smoking in the past year

To go to the overall national result for this question, [please click here](#).

		Never smoked	Current smoker
<b>Wales</b>	<b>Asked about smoking</b>	<b>32,047 (75.8%)</b>	<b>21,924 (84.0%)</b>
	<b>Not asked about smoking</b>	<b>10,220 (24.2%)</b>	<b>4,174 (16.0%)</b>
<b>ABMU</b>	<b>Asked about smoking</b>	5,914 (78.0%)	4,017 (86.2%)
	<b>Not asked about smoking</b>	1,664 (22.0%)	642 (13.8%)
<b>AB</b>	<b>Asked about smoking</b>	6,199 (77.1%)	4,651 (84.9%)
	<b>Not asked about smoking</b>	1,837 (22.9%)	825 (15.1%)
<b>BCU</b>	<b>Asked about smoking</b>	7,468 (69.7%)	5,273 (78.6%)
	<b>Not asked about smoking</b>	3,240 (30.3%)	1,438 (21.4%)
<b>CVU</b>	<b>Asked about smoking</b>	3,120 (78.6%)	2,287 (86.6%)
	<b>Not asked about smoking</b>	851 (21.4%)	354 (13.4%)
<b>CT</b>	<b>Asked about smoking</b>	3,721 (80.4%)	2,482 (87.9%)
	<b>Not asked about smoking</b>	905 (19.6%)	343 (12.1%)
<b>HD</b>	<b>Asked about smoking</b>	4,266 (77.1%)	2,476 (84.7%)
	<b>Not asked about smoking</b>	1,269 (22.9%)	447 (15.3%)
<b>PT</b>	<b>Asked about smoking</b>	1,359 (75.0%)	738 (85.5%)
	<b>Not asked about smoking</b>	454 (25.0%)	125 (14.5%)

### 5.2.6 Exacerbation count in the past year – using validated method

To go to the overall national result for this question, [please click here](#).

	Exacerbation count	Never smoked	Current smoker
<b>Wales</b>	<b>0</b>	<b>24,378/42,018 (58.0%)</b>	<b>15,069/25,858 (58.2%)</b>
	<b>1</b>	<b>7,904/42,018 (18.8%)</b>	<b>4,741/25,858 (18.3%)</b>
	<b>2</b>	<b>3,757/42,018 (8.9%)</b>	<b>2,328/25,858 (9.0%)</b>
	<b>&gt;2</b>	<b>5,979/42,018 (14.2%)</b>	<b>3,720/25,858 (14.4%)</b>
<b>ABMU</b>	<b>0</b>	4,356/7,487 (58.2%)	2,691/4,562 (59.0%)
	<b>1</b>	1,460/7,487 (19.5%)	839/4,562 (18.4%)
	<b>2</b>	636/7,487 (8.5%)	396/4,562 (8.7%)
	<b>&gt;2</b>	1,035/7,487 (13.8%)	636/4,562 (13.9%)
<b>AB</b>	<b>0</b>	4,433/8,036 (55.2%)	3,040/5,476 (55.5%)
	<b>1</b>	1,529/8,036 (19.0%)	1,006/5,476 (18.4%)
	<b>2</b>	737/8,036 (9.2%)	493/5,476 (9.0%)
	<b>&gt;2</b>	1,337/8,036 (16.6%)	937/5,476 (17.1%)

BCU	0	6,344/10,708 (59.3%)	4,008/6,711 (59.7%)
	1	1,899/10,708 (17.7%)	1,227/6,711 (18.3%)
	2	979/10,708 (9.1%)	561/6,711 (8.4%)
	>2	1,486/10,708 (13.9%)	915/6,711 (13.6%)
CVU	0	2,157/3,813 (56.6%)	1,406/2,498 (56.3%)
	1	759/3,813 (19.9%)	477/2,498 (19.1%)
	2	360/3,813 (9.4%)	268/2,498 (10.7%)
	>2	537/3,813 (14.1%)	347/2,498 (13.9%)
CT	0	2,439/4,626 (52.7%)	1,528/2,825 (54.1%)
	1	927/4,626 (20.0%)	506/2,825 (17.9%)
	2	431/4,626 (9.3%)	296/2,825 (10.5%)
	>2	829/4,626 (17.9%)	495/2,825 (17.5%)
HD	0	3,455/5,535 (62.4%)	1,875/2,923 (64.2%)
	1	1,017/5,535 (18.4%)	518/2,923 (17.7%)
	2	474/5,535 (8.6%)	232/2,923 (7.9%)
	>2	589/5,535 (10.6%)	298/2,923 (10.2%)
PT	0	1,194/1,813 (65.9%)	521/863 (60.4%)
	1	313/1,813 (17.3%)	168/863 (19.5%)
	2	140/1,813 (7.7%)	82/863 (9.5%)
	>2	166/1,813 (9.2%)	92/863 (10.7%)

### 5.2.7 The proportion of patients with COPD who have had the influenza immunisation in the preceding 1 August – 31 March

To go to the overall national result for this question, [please click here](#).

	Never smoked	Current smoker
<b>Wales</b>	<b>30,537 (72.3%)</b>	<b>15,079 (57.8%)</b>
ABMU	5,357 (70.7%)	2,647 (56.8%)
AB	5,843 (72.7%)	3,143 (57.4%)
BCU	7,653 (71.5%)	3,899 (58.1%)
CVU	3,007 (75.7%)	1,600 (60.6%)
CT	3,426 (74.1%)	1,666 (59.0%)
HD	3,991 (72.1%)	1,605 (55.0%)
PT	1,260 (69.5%)	519 (60.1%)

### 5.2.8 Proportion of people with COPD who are breathless (any MRC score) and have been referred to PR in the past 3 years

To go to the overall national result for this question, [please click here](#).

	Never smoked	Current smoker
<b>Wales</b>	<b>5,345/24,821 (21.5%)</b>	<b>2,924/14,796 (19.8%)</b>
ABMU	991/4,423 (22.4%)	548/2,703 (20.3%)
AB	1,092/4,417 (24.7%)	687/2,854 (24.1%)
BCU	1,366/6,854 (19.9%)	734/4,147 (17.7%)
CVU	472/2,155 (21.9%)	274/1,400 (19.6%)
CT	485/2,332 (20.8%)	285/1,426 (20.0%)
HD	738/3,666 (20.1%)	303/1,871 (16.2%)
PT	201/974 (20.6%)	93/395 (23.5%)

### 5.2.9 Proportion of people with COPD with MRC scores 3–5 and have been referred to PR in the past 3 years

To go to the overall national result for this question, [please click here](#).

	Never smoked	Current smoker
Wales	4,033/7,684 (51.3%)	2,173/4,189 (51.9%)
ABMU	772/1,476 (52.3%)	441/818 (53.9%)
AB	793/1,534 (51.7%)	477/868 (55.0%)
BCU	1,019/2,019 (50.5%)	539/1,139 (47.3%)
CVU	375/675 (55.6%)	224/419 (53.5%)
CT	378/811 (46.6%)	209/404 (51.7%)
HD	580/1,075 (54.0%)	230/436 (52.8%)
PT	116/274 (42.3%)	53/105 (50.5%)



### 5.3. Patients from a lower socioeconomic group

[Back to contents](#)

#### Key findings

- The 10% most deprived patients (by Welsh Index of Multiple Deprivation (WIMD)) relative to the 50% least deprived:
  - were **7% less likely** (OR: 0.93 (95% CI: 0.89–0.98)) to have an **MRC score recorded** in the past year
  - were **26% more likely** (OR: 1.26 (95% CI: 1.19–1.33)) to be **asked about smoking**. There was a significant trend of increasing likelihood with increasing deprivation ( $p < 0.0001$ )
  - were **27% less likely** (OR: 0.73 (95% CI: 0.69–0.77)) to receive the influenza immunisation. There was a **significant trend of decreasing likelihood of immunisation with increasing deprivation** ( $p < 0.0001$ )
  - were **29% more likely** (OR: 1.29 (95% CI: 1.14–1.46)) to have received or had a referral to a **behavioural change intervention** and had a stop smoking drug prescribed if they were a current smoker. There was a significant trend of increasing likelihood with increasing deprivation ( $p < 0.0001$ )
  - were **19% more likely** (OR: 1.19 (95% CI: 1.10–1.28)) to have been **referred to pulmonary rehabilitation** in the past 3 years if they had any MRC score. There was a significant trend of increasing likelihood with increasing deprivation ( $p < 0.0001$ ).

#### Navigation

This section contains the following tables. If viewing this report on a computer, you can select the table that you wish to see from the list below.

- [5.3 The socio-economic groupings of the audit cohort](#)
  - [5.3.1 The percentage of people diagnosed with COPD in the past two years who have a post bronchodilator FEV1/FVC \(latest ever recorded\) < 0.7 \(consistent with airways obstruction\)](#)

- 5.3.2 The percentage of people with COPD who had a chest x-ray or CT scan 6 months prior to diagnosis or within 6 months of diagnosis (i.e. when COPD code first added to disease register)
- 5.3.3 The proportion of people with COPD with MRC scores recorded in the last year
- 5.3.4 The proportion of people with COPD who have a measure of FEV1 percent-predicted value recorded in the last year
- 5.3.5 The proportion and status of people with COPD who were asked about tobacco smoking in the last year
- 5.3.6 Exacerbation count in the past year – using validated method
- 5.3.7 The proportion of patients with COPD who have had the influenza immunisation in the preceding 1 August to 31 March
- 5.3.8 The proportion of people with COPD who were recorded as a current smoker at any time in the last 2 years who have received or had a referral to a behavioural change intervention and had a stop smoking drug prescribed
- 5.3.9 Proportion of people with COPD who are breathless (any MRC score) and have been referred to pulmonary rehabilitation (PR) in the past 3 years
- 5.3.10 Proportion of people with COPD with MRC scores 3–5 and have been referred to PR in the past 3 years.

### 5.3 The socioeconomic groupings of the audit cohort

	WIMD 1	WIMD 2	WIMD 3	WIMD 4	WIMD 5
<b>Wales (N=81,963)</b>	<b>N=21,806 (26.6%)</b>	<b>N=19,638 (24.0%)</b>	<b>N=16,517 (20.2%)</b>	<b>N=14,172 (17.3%)</b>	<b>N=9,810 (12.0%)</b>
<b>ABMU (N=14,348)</b>	N=4,874 (34.0%)	N=3,449 (24.0%)	N=2,345 (16.3%)	N=1,551 (10.8%)	N=2,129 (14.8%)
<b>AB (N=16,200)</b>	N=5,796 (35.8%)	N=4,296 (26.5%)	N=2,886 (17.8%)	N=1,755 (10.8%)	N=1,467 (9.1%)
<b>BCU (N=21,273)</b>	N=3,596 (16.9%)	N=4,453 (20.9%)	N=4,848 (22.8%)	N=5,451 (25.6%)	N=2,925 (13.7%)
<b>CVU (N=7,735)</b>	N=2,835 (36.7%)	N=1,214 (15.7%)	N=817 (10.6%)	N=940 (12.2%)	N=1,929 (24.9%)
<b>CT (N=8,888)</b>	N=3,505 (39.4%)	N=3,071 (34.6%)	N=1,209 (13.6%)	N=600 (6.8%)	N=503 (5.7%)
<b>HD (N=10,321)</b>	N=1,017 (9.9%)	N=2,585 (25.0%)	N=3,562 (34.5%)	N=2,616 (25.3%)	N=541 (5.2%)
<b>PT (N=3,178)</b>	N=183 (5.8%)	N=570 (17.9%)	N=850 (26.7%)	N=1,259 (39.6%)	N=316 (9.9%)

**Please note:** all subsequent analyses in this section use these denominators unless otherwise specified and provided. Additionally, where the results are less than five, exact figures and percentages have been suppressed and replaced with '<5', in line with the Office for National Statistics confidentiality guidance.<sup>54</sup>

#### 5.3.1 The percentage of people diagnosed with COPD in the past two years who have a post-bronchodilator FEV1/FVC (latest ever recorded) <0.7 (consistent with airways obstruction)

To go to the overall national result for this question, [please click here](#).

Wales	WIMD 1	248/2,830 (8.8%)
	WIMD 2	253/2,625 (9.6%)
	WIMD 3	172/2,193 (7.8%)
	WIMD 4	119/1,819 (6.5%)
	WIMD 5	102/1,305 (7.8%)
ABMU	WIMD 1	55/692 (8.0%)
	WIMD 2	36/477 (7.6%)
	WIMD 3	17/319 (5.3%)
	WIMD 4	14/225 (6.2%)
	WIMD 5	8/305 (2.6%)
AB	WIMD 1	83/715 (11.6%)
	WIMD 2	76/600 (12.7%)
	WIMD 3	68/381 (17.9%)
	WIMD 4	21/236 (8.9%)
	WIMD 5	10/181 (5.5%)
BCU	WIMD 1	<5/415
	WIMD 2	16/557 (2.9%)
	WIMD 3	25/606 (4.1%)
	WIMD 4	36/664 (5.4%)
	WIMD 5	12/363 (3.3%)
CVU	WIMD 1	27/425 (6.4%)
	WIMD 2	25/198 (12.6%)
	WIMD 3	6/102 (5.9%)
	WIMD 4	30/138 (21.7%)
	WIMD 5	52/270 (19.3%)
CT	WIMD 1	72/434 (16.6%)
	WIMD 2	80/386 (20.7%)
	WIMD 3	25/159 (15.7%)
	WIMD 4	<5/62
	WIMD 5	11/74 (14.9%)
HD	WIMD 1	7/128 (5.5%)
	WIMD 2	16/344 (4.7%)
	WIMD 3	28/505 (5.5%)
	WIMD 4	13/366 (3.6%)
	WIMD 5	8/72 (11.1%)
PT	WIMD 1	<5/21
	WIMD 2	<5/63
	WIMD 3	<5/121
	WIMD 4	<5/128
	WIMD 5	<5/40

**5.3.2 The percentage of people with COPD who had a chest X-ray or CT scan 6 months prior to diagnosis or within 6 months of diagnosis (ie when COPD code first added to disease register).**  
*To go to the overall national result for this question, [please click here](#).*



Wales	WIMD 1	1,129/2,830 (39.9%)
	WIMD 2	1,040/2,625 (39.6%)
	WIMD 3	814/2,193 (37.1%)
	WIMD 4	737/1,819 (40.5%)
	WIMD 5	549/1,305 (42.1%)
ABMU	WIMD 1	329/692 (47.5%)
	WIMD 2	199/477 (41.7%)
	WIMD 3	121/319 (37.9%)
	WIMD 4	100/225 (44.4%)
	WIMD 5	150/305 (49.2%)
AB	WIMD 1	242/715 (33.9%)
	WIMD 2	187/600 (31.2%)
	WIMD 3	109/381 (28.6%)
	WIMD 4	78/236 (33.1%)
	WIMD 5	46/181 (25.4%)
BCU	WIMD 1	146/415 (35.2%)
	WIMD 2	226/557 (40.6%)
	WIMD 3	211/606 (34.8%)
	WIMD 4	251/664 (37.8%)
	WIMD 5	158/363 (43.5%)
CVU	WIMD 1	184/425 (43.3%)
	WIMD 2	92/198 (46.5%)
	WIMD 3	40/102 (39.2%)
	WIMD 4	57/138 (41.3%)
	WIMD 5	122/270 (45.2%)
CT	WIMD 1	157/434 (36.2%)
	WIMD 2	153/386 (39.6%)
	WIMD 3	71/159 (44.7%)
	WIMD 4	25/62 (40.3%)
	WIMD 5	23/74 (31.1%)
HD	WIMD 1	60/128 (46.9%)
	WIMD 2	149/344 (43.3%)
	WIMD 3	211/505 (41.8%)
	WIMD 4	171/366 (46.7%)
	WIMD 5	38/72 (52.8%)
PT	WIMD 1	11/21 (52.4%)
	WIMD 2	34/63 (54.0%)
	WIMD 3	51/121 (42.2%)
	WIMD 4	55/128 (43.0%)
	WIMD 5	12/40 (30.0%)

### 5.3.3 The proportion of people with COPD with MRC scores recorded in the past year

To go to the overall national result and MRC scores, [please click here](#).

The recording of breathlessness, and its severity, are integral to ensuring that all patients receive the most appropriate and suitable care and interventions.

		WIMD 1	WIMD 2	WIMD 3	WIMD 4	WIMD 5
Wales	Recorded	13,223 (60.6%)	12,021 (61.2%)	10,097 (61.1%)	8,571 (60.5%)	6,105 (62.2%)
	Not recorded	8,583 (39.4%)	7,617 (38.8%)	6,420 (38.9%)	5,601 (39.5%)	3,705 (37.8%)
ABMU	Recorded	3,048 (62.5%)	2,260 (65.5%)	1,497 (63.8%)	988 (63.7%)	1,311 (61.6%)
	Not recorded	1,826 (37.5%)	1,189 (34.5%)	848 (36.2%)	563 (36.3%)	818 (38.4%)
AB	Recorded	3,238 (55.9%)	2,624 (61.1%)	1,773 (61.4%)	1,097 (62.5%)	939 (64.0%)
	Not recorded	2,558 (44.1%)	1,672 (38.9%)	1,113 (38.6%)	658 (37.5%)	528 (36.0%)
BCU	Recorded	2,119 (58.9%)	2,568 (57.7%)	2,784 (57.4%)	3,267 (59.9%)	1,804 (61.7%)
	Not recorded	1,477 (41.1%)	1,885 (42.3%)	2,064 (42.6%)	2,184 (40.1%)	1,121 (38.3%)
CVU	Recorded	1,862 (65.7%)	790 (65.1%)	570 (69.8%)	593 (63.1%)	1,221 (63.3%)
	Not recorded	973 (34.3%)	424 (34.9%)	247 (30.2%)	347 (36.9%)	708 (36.7%)
CT	Recorded	2,250 (64.2%)	1,965 (64.0%)	724 (59.9%)	351 (58.5%)	331 (65.8%)
	Not recorded	1,255 (35.8%)	1,106 (36.0%)	485 (40.1%)	249 (41.5%)	172 (34.2%)
HD	Recorded	597 (58.7%)	1,454 (56.3%)	2,200 (61.8%)	1,552 (59.3%)	304 (56.2%)
	Not recorded	420 (41.3%)	1,131 (43.8%)	1,362 (38.2%)	1,064 (40.7%)	237 (43.8%)
PT	Recorded	109 (59.6%)	360 (63.2%)	549 (64.6%)	723 (57.4%)	195 (61.7%)
	Not recorded	74 (40.4%)	210 (36.8%)	301 (35.4%)	536 (42.6%)	121 (38.3%)

### 5.3.4 The proportion of people with COPD who have a measure of FEV1 %-predicted value recorded in the past year.

To go to the overall national result for this question, [please click here](#).

Wales	WIMD 1	5,841 (26.8%)
	WIMD 2	5,408 (27.5%)
	WIMD 3	4,646 (28.1%)
	WIMD 4	3,996 (28.2%)
	WIMD 5	2,703 (27.6%)
ABMU	WIMD 1	1,309 (26.9%)
	WIMD 2	821 (23.8%)
	WIMD 3	542 (23.1%)
	WIMD 4	369 (23.8%)
	WIMD 5	498 (23.4%)
AB	WIMD 1	1,656 (28.6%)
	WIMD 2	1,337 (31.1%)
	WIMD 3	980 (34.0%)
	WIMD 4	606 (34.5%)
	WIMD 5	562 (38.3%)
BCU	WIMD 1	1,057 (29.4%)
	WIMD 2	1,579 (35.5%)
	WIMD 3	1,499 (30.9%)
	WIMD 4	1,828 (33.5%)
	WIMD 5	926 (31.7%)
CVU	WIMD 1	593 (20.9%)
	WIMD 2	259 (21.3%)
	WIMD 3	203 (24.9%)
	WIMD 4	236 (25.1%)
	WIMD 5	330 (17.1%)

CT	WIMD 1	994 (28.4%)
	WIMD 2	827 (26.9%)
	WIMD 3	359 (29.7%)
	WIMD 4	115 (19.2%)
	WIMD 5	142 (28.2%)
HD	WIMD 1	206 (20.3%)
	WIMD 2	470 (18.2%)
	WIMD 3	745 (20.9%)
	WIMD 4	546 (20.9%)
	WIMD 5	162 (29.9%)
PT	WIMD 1	26 (14.2%)
	WIMD 2	115 (20.2%)
	WIMD 3	318 (37.4%)
	WIMD 4	296 (23.5%)
	WIMD 5	83 (26.3%)

### 5.3.5 The proportion and status of people with COPD who were asked about tobacco smoking in the past year.

To go to the overall national result for this question, [please click here](#).

		Asked about smoking	Not asked about smoking
Wales	WIMD 1	17,357 (79.6%)	4,449 (20.4%)
	WIMD 2	15,421 (78.5%)	4,217 (21.5%)
	WIMD 3	12,705 (76.9%)	3,812 (23.1%)
	WIMD 4	10,662 (75.2%)	3,510 (24.8%)
	WIMD 5	7,417 (75.6%)	2,393 (24.4%)
ABMU	WIMD 1	3,907 (80.2%)	967 (19.8%)
	WIMD 2	2,786 (80.8%)	663 (19.2%)
	WIMD 3	1,897 (80.9%)	448 (19.1%)
	WIMD 4	1,239 (79.9%)	312 (20.1%)
	WIMD 5	1,637 (76.9%)	492 (23.1%)
AB	WIMD 1	4,645 (80.1%)	1,151 (19.9%)
	WIMD 2	3,431 (79.9%)	865 (20.1%)
	WIMD 3	2,294 (79.5%)	592 (20.5%)
	WIMD 4	1,365 (77.8%)	390 (22.2%)
	WIMD 5	1,173 (80.0%)	294 (20.0%)
BCU	WIMD 1	2,596 (72.2%)	1,000 (27.8%)
	WIMD 2	3,187 (71.6%)	1,266 (28.4%)
	WIMD 3	3,439 (70.9%)	1,409 (29.1%)
	WIMD 4	3,871 (71.0%)	1,580 (29.0%)
	WIMD 5	2,099 (71.8%)	826 (28.2%)
CVU	WIMD 1	2,325 (82.0%)	510 (18.0%)
	WIMD 2	987 (81.3%)	227 (18.7%)
	WIMD 3	696 (85.2%)	121 (14.8%)
	WIMD 4	748 (79.6%)	192 (20.4%)
	WIMD 5	1,479 (76.7%)	450 (23.3%)

CT	WIMD 1	2,919 (83.3%)	586 (16.7%)
	WIMD 2	2,576 (83.9%)	495 (16.1%)
	WIMD 3	980 (81.1%)	229 (18.9%)
	WIMD 4	481 (80.2%)	119 (19.8%)
	WIMD 5	365 (72.6%)	138 (27.4%)
HD	WIMD 1	816 (80.2%)	201 (19.8%)
	WIMD 2	2,018 (78.1%)	567 (21.9%)
	WIMD 3	2,719 (76.3%)	843 (23.7%)
	WIMD 4	2,031 (77.6%)	585 (22.4%)
	WIMD 5	426 (78.7%)	115 (21.3%)
PT	WIMD 1	149 (81.4%)	34 (18.6%)
	WIMD 2	436 (76.5%)	134 (23.5%)
	WIMD 3	680 (80.0%)	170 (20.0%)
	WIMD 4	927 (73.6%)	332 (26.4%)
	WIMD 5	238 (75.3%)	78 (24.7%)

### 5.3.6 Exacerbation count in the past year – using validated method

To go to the overall national result for this question, [please click here](#).

		0	1	2	>2
Wales	WIMD 1	11,855/21,447 (55.3%)	3,896/21,447 (18.2%)	2,008/21,447 (9.4%)	3,688/21,447 (17.2%)
	WIMD 2	11,208/19,545 (57.3%)	3,523/19,545 (18.0%)	1,834/19,545 (9.4%)	2,980/19,545 (15.3%)
	WIMD 3	9,621/16,487 (58.4%)	3,052/16,487 (18.5%)	1,492/16,487 (9.1%)	2,322/16,487 (14.1%)
	WIMD 4	8,618/14,146 (60.9%)	2,586/14,146 (18.3%)	1,188/14,146 (8.4%)	1,754/14,146 (12.4%)
	WIMD 5	5,905/9,758 (60.5%)	1,838/9,758 (18.8%)	836/9,758 (8.6%)	1,179/9,758 (12.1%)
ABMU	WIMD 1	2,625/4,707 (55.8%)	884/4,707 (18.8%)	443/4,707 (9.4%)	755/4,707 (16.0%)
	WIMD 2	1,987/3,431 (57.9%)	634/3,431 (18.5%)	295/3,431 (8.6%)	515/3,431 (15.0%)
	WIMD 3	1,409/2,344 (60.1%)	404/2,344 (17.2%)	194/2,344 (8.3%)	337/2,344 (14.4%)
	WIMD 4	895/1,540 (58.1%)	322/1,540 (20.9%)	140/1,540 (9.1%)	183/1,540 (11.9%)
	WIMD 5	1,318/2,108 (62.5%)	410/2,108 (19.5%)	155/2,108 (7.4%)	225/2,108 (10.7%)
AB	WIMD 1	3,181/5,796 (54.9%)	992/5,796 (17.1%)	525/5,796 (9.1%)	1,098/5,796 (18.9%)
	WIMD 2	2,429/4,296 (56.5%)	725/4,296 (16.9%)	405/4,296 (9.4%)	737/4,296 (17.2%)
	WIMD 3	1,523/2,886 (52.8%)	597/2,886 (20.7%)	252/2,886 (8.7%)	514/2,886 (17.8%)
	WIMD 4	982/1,755 (56.0%)	331/1,755 (18.9%)	173/1,755 (9.9%)	269/1,755 (15.3%)
	WIMD 5	837/1,467 (57.1%)	295/1,467 (20.1%)	133/1,467 (9.1%)	202/1,467 (13.8%)
BCU	WIMD 1	2,144/3,596 (59.6%)	606/3,596 (16.9%)	288/3,596 (8.0%)	558/3,596 (15.5%)
	WIMD 2	2,597/4,453 (58.3%)	774/4,453 (17.4%)	429/4,453 (9.6%)	653/4,453 (14.7%)
	WIMD 3	2,817/4,848 (58.1%)	870/4,848 (18.0%)	438/4,848 (9.0%)	723/4,848 (14.9%)
	WIMD 4	3,305/5,451 (60.6%)	985/5,451 (18.1%)	453/5,451 (8.3%)	708/5,451 (13.0%)
	WIMD 5	1,748/2,925 (59.8%)	517/2,925 (17.7%)	288/2,925 (9.9%)	372/2,925 (12.7%)
CVU	WIMD 1	1,401/2,643 (53.0%)	539/2,643 (20.4%)	261/2,643 (9.9%)	442/2,643 (16.7%)
	WIMD 2	616/1,139 (54.1%)	218/1,139 (19.1%)	142/1,139 (12.5%)	163/1,139 (14.3%)
	WIMD 3	465/788 (59.0%)	142/788 (18.0%)	86/788 (10.9%)	95/788 (12.1%)
	WIMD 4	535/925 (57.8%)	181/925 (19.6%)	90/925 (9.7%)	119/925 (12.9%)
	WIMD 5	1,160/1,898 (61.1%)	362/1,898 (19.1%)	158/1,898 (8.3%)	218/1,898 (11.5%)

CT	WIMD 1	1,785/3,505 (50.9%)	663/3,505 (18.9%)	383/3,505 (10.9%)	674/3,505 (19.2%)
	WIMD 2	1,656/3,071 (53.9%)	595/3,071 (19.4%)	270/3,071 (8.8%)	550/3,071 (17.9%)
	WIMD 3	666/1,209 (55.1%)	226/1,209 (18.7%)	127/1,209 (10.5%)	190/1,209 (15.7%)
	WIMD 4	338/600 (56.3%)	110/600 (18.3%)	55/600 (9.2%)	97/600 (16.2%)
	WIMD 5	271/503 (53.9%)	97/503 (19.3%)	42/503 (8.4%)	93/503 (18.5%)
HD	WIMD 1	612/1,017 (60.2%)	183/1,017 (18.0%)	86/1,017 (8.5%)	136/1,017 (13.4%)
	WIMD 2	1,580/2,585 (61.1%)	465/2,585 (18.0%)	239/2,585 (9.3%)	301/2,585 (11.6%)
	WIMD 3	2,202/3,562 (61.8%)	665/3,562 (18.7%)	320/3,562 (9.0%)	375/3,562 (10.5%)
	WIMD 4	1,715/2,616 (65.6%)	450/2,616 (17.2%)	195/2,616 (7.5%)	256/2,616 (9.8%)
	WIMD 5	356/541 (65.8%)	103/541 (19.0%)	36/541 (6.7%)	46/541 (8.5%)
PT	WIMD 1	107/183 (58.5%)	29/183 (15.9%)	22/183 (12.0%)	25/183 (13.7%)
	WIMD 2	343/570 (60.2%)	112/570 (19.7%)	54/570 (9.5%)	61/570 (10.7%)
	WIMD 3	539/850 (63.4%)	148/850 (17.4%)	75/850 (8.8%)	88/850 (10.4%)
	WIMD 4	848/1,259 (67.4%)	207/1,259 (16.4%)	82/1,259 (6.5%)	122/1,259 (9.7%)
	WIMD 5	215/316 (68.0%)	54/316 (17.1%)	24/316 (7.6%)	23/316 (7.3%)

### 5.3.7 The proportion of patients with COPD who have had the influenza immunisation in the preceding 1 August – 31 March.

To go to the overall national result for this question, [please click here](#).

Wales	WIMD 1	<b>13,773 (63.2%)</b>
	WIMD 2	<b>12,880 (65.6%)</b>
	WIMD 3	<b>10,969 (66.4%)</b>
	WIMD 4	<b>9,649 (68.1%)</b>
	WIMD 5	<b>6,885 (70.2%)</b>
ABMU	WIMD 1	3,052 (62.6%)
	WIMD 2	2,154 (62.5%)
	WIMD 3	1,554 (66.3%)
	WIMD 4	1,054 (68.0%)
	WIMD 5	1,436 (67.5%)
AB	WIMD 1	3,679 (63.5%)
	WIMD 2	2,845 (66.2%)
	WIMD 3	1,955 (67.7%)
	WIMD 4	1,188 (67.7%)
	WIMD 5	1,065 (72.6%)
BCU	WIMD 1	2,204 (61.3%)
	WIMD 2	2,896 (65.0%)
	WIMD 3	3,160 (65.2%)
	WIMD 4	3,672 (67.4%)
	WIMD 5	2,053 (70.2%)
CVU	WIMD 1	1,837 (64.8%)
	WIMD 2	843 (69.4%)
	WIMD 3	581 (71.1%)
	WIMD 4	678 (72.1%)
	WIMD 5	1,386 (71.9%)
CT	WIMD 1	2,264 (64.6%)
	WIMD 2	2,156 (70.2%)
	WIMD 3	826 (68.3%)
	WIMD 4	426 (71.0%)
	WIMD 5	357 (71.0%)

HD	WIMD 1	621 (61.1%)
	WIMD 2	1,653 (64.0%)
	WIMD 3	2,326 (65.3%)
	WIMD 4	1,793 (68.6%)
	WIMD 5	372 (68.8%)
PT	WIMD 1	116 (63.4%)
	WIMD 2	333 (58.4%)
	WIMD 3	567 (66.7%)
	WIMD 4	838 (66.6%)
	WIMD 5	216 (68.4%)

**5.3.8 The proportion of people with COPD who were recorded as a current smoker at any time in the past 2 years who have received or had a referral to a behavioural change intervention and had a stop smoking drug prescribed.**

To go to the overall national result for this question, [please click here](#).

Wales	WIMD 1	<b>1,496/11,148 (13.4%)</b>
	WIMD 2	<b>1,102/8,578 (12.6%)</b>
	WIMD 3	<b>797/6,653 (12.0%)</b>
	WIMD 4	<b>620/5,059 (12.3%)</b>
	WIMD 5	<b>339/3,160 (10.7%)</b>
ABMU	WIMD 1	219/2,470 (8.9%)
	WIMD 2	130/1,533 (8.5%)
	WIMD 3	44/926 (4.8%)
	WIMD 4	42/582 (7.2%)
	WIMD 5	31/624 (5.0%)
AB	WIMD 1	449/3,003 (15.0%)
	WIMD 2	304/1,954 (15.6%)
	WIMD 3	132/1,161 (11.4%)
	WIMD 4	73/590 (12.4%)
	WIMD 5	47/507 (9.3%)
BCU	WIMD 1	259/1,896 (13.7%)
	WIMD 2	246/2,120 (11.6%)
	WIMD 3	266/2,045 (13.0%)
	WIMD 4	257/1,995 (12.9%)
	WIMD 5	128/995 (13.4%)
CVU	WIMD 1	332/1,530 (21.7%)
	WIMD 2	116/579 (20.0%)
	WIMD 3	84/410 (20.5%)
	WIMD 4	86/353 (24.4%)
	WIMD 5	87/570 (15.3%)
CT	WIMD 1	156/1,587 (9.8%)
	WIMD 2	127/1,194 (10.6%)
	WIMD 3	38/442 (8.6%)
	WIMD 4	19/199 (9.6%)
	WIMD 5	12/159 (7.6%)

HD	WIMD 1	72/548 (13.1%)
	WIMD 2	147/1,079 (13.6%)
	WIMD 3	162/1,308 (12.4%)
	WIMD 4	77/885 (8.7%)
	WIMD 5	21/182 (11.5%)
PT	WIMD 1	9/114 (7.9%)
	WIMD 2	32/299 (10.7%)
	WIMD 3	71/361 (19.7%)
	WIMD 4	66/455 (14.5%)
	WIMD 5	13/163 (8.0%)

### 5.3.9 Proportion of people with COPD who are breathless (any MRC score) and have been referred to PR in the past 3 years.

To go to the overall national result for this question, [please click here](#).

Wales	WIMD 1	<b>2,755/12,008 (22.9%)</b>
	WIMD 2	<b>2,352/10,959 (21.5%)</b>
	WIMD 3	<b>2,059/9,812 (21.0%)</b>
	WIMD 4	<b>1,728/8,696 (19.9%)</b>
	WIMD 5	<b>1,221/6,090 (20.1%)</b>
ABMU	WIMD 1	654/2,779 (23.5%)
	WIMD 2	393/2,004 (19.6%)
	WIMD 3	313/1,415 (22.1%)
	WIMD 4	190/929 (20.5%)
	WIMD 5	294/1,259 (23.4%)
AB	WIMD 1	787/3,134 (25.1%)
	WIMD 2	565/2,200 (25.7%)
	WIMD 3	358/1,513 (23.7%)
	WIMD 4	248/959 (25.9%)
	WIMD 5	234/898 (26.1%)
BCU	WIMD 1	487/2,295 (21.2%)
	WIMD 2	540/2,682 (20.1%)
	WIMD 3	598/2,966 (20.2%)
	WIMD 4	656/3,506 (18.7%)
	WIMD 5	333/1,980 (16.8%)
CVU	WIMD 1	314/1,411 (22.3%)
	WIMD 2	163/656 (24.9%)
	WIMD 3	114/455 (25.1%)
	WIMD 4	108/543 (19.9%)
	WIMD 5	179/1,147 (15.6%)
CT	WIMD 1	380/1,709 (22.2%)
	WIMD 2	326/1,532 (21.3%)
	WIMD 3	114/649 (17.6%)
	WIMD 4	73/315 (23.2%)
	WIMD 5	63/300 (21.0%)
HD	WIMD 1	123/607 (20.3%)
	WIMD 2	310/1,672 (18.5%)
	WIMD 3	458/2,398 (19.1%)
	WIMD 4	323/1,681 (19.2%)
	WIMD 5	76/355 (21.4%)

PT	WIMD 1	10/73 (13.7%)
	WIMD 2	55/213 (25.8%)
	WIMD 3	104/416 (25.0%)
	WIMD 4	130/763 (17.0%)
	WIMD 5	42/151 (27.8%)

### 5.3.10 Proportion of people with COPD with MRC scores 3–5 and have been referred to PR in the past 3 years.

To go to the overall national result for this question, [please click here](#).

Wales	WIMD 1	<b>2,159/4,341 (49.7%)</b>
	WIMD 2	<b>1,781/3,600 (49.5%)</b>
	WIMD 3	<b>1,541/3,005 (51.3%)</b>
	WIMD 4	<b>1,231/2,483 (49.6%)</b>
	WIMD 5	<b>867/1,637 (53.0%)</b>
ABMU	WIMD 1	541/1,008 (53.7%)
	WIMD 2	308/639 (48.2%)
	WIMD 3	255/466 (54.7%)
	WIMD 4	146/303 (48.2%)
	WIMD 5	215/397 (54.2%)
AB	WIMD 1	596/1,179 (50.6%)
	WIMD 2	404/776 (52.1%)
	WIMD 3	252/470 (53.6%)
	WIMD 4	176/304 (57.9%)
	WIMD 5	146/252 (57.9%)
BCU	WIMD 1	381/817 (46.6%)
	WIMD 2	422/866 (48.7%)
	WIMD 3	426/919 (46.4%)
	WIMD 4	460/981 (46.9%)
	WIMD 5	242/492 (49.2%)
CVU	WIMD 1	260/522 (49.8%)
	WIMD 2	132/223 (59.2%)
	WIMD 3	91/145 (62.8%)
	WIMD 4	82/159 (51.6%)
	WIMD 5	134/272 (49.3%)
CT	WIMD 1	287/590 (48.6%)
	WIMD 2	247/521 (47.4%)
	WIMD 3	83/180 (46.1%)
	WIMD 4	54/112 (48.2%)
	WIMD 5	47/79 (59.5%)
HD	WIMD 1	88/206 (42.7%)
	WIMD 2	233/480 (48.5%)
	WIMD 3	363/682 (53.2%)
	WIMD 4	244/431 (56.6%)
	WIMD 5	62/109 (56.9%)
PT	WIMD 1	6/19 (31.6%)
	WIMD 2	35/95 (36.8%)
	WIMD 3	71/143 (49.7%)
	WIMD 4	69/193 (35.8%)
	WIMD 5	21/36 (58.3%)



## Appendix A: Report preparation

This report was written by the following, on behalf of the National COPD Audit Programme's primary care workstream group (the full list of workstream group members is included in [Appendix D](#)).

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## Appendix B: Introduction to the National COPD Audit Programme

The National COPD Audit Programme is a programme of work that aims to drive improvements in the quality of care and services provided for COPD patients in England and Wales. The programme looks at COPD care across the patient pathway, both in and out of hospital, bringing together key elements from the primary, secondary and community care sectors.

There are three programme workstreams.

- 1 Primary care: collection of audit data from general practice patient record systems in Wales. Delivered by the Royal College of Physicians (RCP) and NHS Digital, working with the Primary Care Respiratory Society UK, the Royal College of General Practitioners (RCGP) and the NHS Wales Informatics Service. Another round of audit took place in 2017.
- 2 Secondary care: in 2014, there were snapshot audits of patients admitted to hospital with COPD exacerbation, plus organisational audits of the resourcing of COPD services in acute units. The 2014 audits were delivered by the British Thoracic Society (BTS), working with the RCP. A continuous audit of admission to hospital with COPD exacerbation commenced in 2017.
- 3 Pulmonary rehabilitation: audits of COPD patients attending PR (including outcomes at 180 days), plus organisational audits of the resourcing of PR services for COPD patients. The 2015 round of this audit was delivered by the BTS, working with the RCP. Another round of snapshot clinical and organisational audits took place in 2017.

The audit also delivered a 1-year development project exploring the potential/feasibility of future incorporation of a patient-reported experience measure (PREM) into the audit programme. This was delivered by the British Lung Foundation, working with the Picker Institute Europe.

The programme is commissioned by the Healthcare Quality Improvement Partnership (HQIP) as part of the National Clinical Audit (NCA) Programme. It is included in the list of national audits for inclusion in NHS trusts' quality accounts and also the NHS Wales Clinical Audit and Outcome Review Plan.

## Appendix C: Audit methodology

The methodology for the National COPD Audit Programme's primary care audit 2017 builds upon the learning from the 2014–15 audit. This audit uses data extracted from general practices in Wales in June 2017 to cover the years following the last audit, from 1 April 2015 to 31 March 2017.

Data were extracted directly from general practice electronic systems by the NHS Wales Informatics Service (NWIS), for all practices that opted in. After some basic processing by NWIS, cleaning and analysis were conducted by Imperial College London.

The 2017 audit included **407/435** practices, 93.6% of all practices in Wales.

*Number of participating practices, per local health board (LHB), in the 2017 primary care audit*

Local health board (LHB)	Total number of practices	Number participating	Percent participating
Abertawe Bro Morgannwg	73	69	94.5%
Aneurin Bevan	80	79	98.8%
Betsi Cadwaladr	108	105	97.2%
Cardiff & Vale	66	53	80.3%
Cwm Taf	42	38	90.5%
Hywel Dda	50	50	100.0%
Powys	16	13	81.3%
<b>Wales</b>	<b>435</b>	<b>407</b>	<b>93.6%</b>

### Recruitment

The audit operated on an opt-in basis. The 2014–15 audit included 61% of practices. In a bid to improve upon that figure, a concentrated effort was focused on communication with practices and LHBs.

All general practices in Wales were eligible to participate in the audit. The audit programme team worked with the Welsh Government's Major Health Conditions Policy team in the production and dissemination of letters advertising recruitment. These letters were signed by the chief medical officer of NHS Wales, and co-signed by the quality lead for RCGP Wales, the chair for General Practitioners Committee (GPC) Wales, as well as the programme's primary care workstream clinical lead. They were sent in early March 2017 to all LHB chief executive officers, directors of primary care, medical directors and assistant medical directors (primary care). Enclosed with this letter was another letter that the LHBs were encouraged to send on to their practices. Both these letters contained details on the queries that the audit would contain, as well as the process required to opt in. In order for practices to opt in, they needed to send an email to their LHB primary care lead saying they wished to take part, and the lead then emailed NWIS with the list of participants from across the LHB. As the audit used an extraction methodology, once the practices had opted in, no subsequent effort was involved.

The reasons provided to LHBs and practices as to why to participate were as follows.

- To identify areas in which individual practices, and LHBs, can improve the provision and quality of care for COPD patients. It will then seek to influence the development of quality improvement resources/activities that:

- result in improved care for patients, and reduce hospitalisations
- may potentially result in efficiency savings within practices
- could count towards personal development / revalidation requirements of practice staff.
- To benchmark practices with their LHB as well as nationally, to provide opportunities to share good practice ideas.
- To facilitate improvements in data quality / completeness to support the effective management of COPD patients.
- To build a more comprehensive national body of evidence on which to increase understanding of COPD care across Wales.
- Society as a whole will benefit through improvement in service quality and outcomes for COPD patients, and its potential impact for the wider economy/community.
- For those who participated in the last round, it is an opportunity to measure improvements in care since the last audit period.

The recruitment period ended in May 2017. Data were extracted in June 2017.

### **Information governance**

No patient identifiers were collected for this audit, and identifiable data were pseudonymised at source, as follows.

- NHS number was replaced by study ID (a sequence of 10 letters and numbers).
- Postcode was transformed to Lower layer Super Output Area (LSOA) and WIMD index.
- Date of birth was transformed to patient age.
- Date of death (if recorded) was transformed to age at death.

The data extraction, led by NWIS, took place automatically using Audit+, software already installed on the vast majority of general practice systems in Wales. The pseudonymised data were transferred securely to the NWIS 'safe haven' central repository, before being transferred securely to Imperial College London for cleaning and analysis.

As patient identifiable information was not transferred for the purpose of this audit, practices did not need to gain patient consent, nor was Section 251 approval required (the audit exited from the approval granted for the first round of primary care audit). However, a patient information sheet and poster was provided to practices for local use in 'fair processing' activities. These were provided in both English and Welsh, and can be found at [www.rcplondon.ac.uk/projects/outputs/national-copd-primary-care-audit-wales-2015-17-resources](http://www.rcplondon.ac.uk/projects/outputs/national-copd-primary-care-audit-wales-2015-17-resources).

The audit was approved in Wales by the Data Quality System (DQS) Governance Group (chaired by GPC Wales), which oversees the use of Audit+ and all data derived from it.

### **Audit question development**

The audit questions and their associated Read codes were developed iteratively by the audit programme team and clinical lead, in consultation with the workstream group, in particular with the representatives of NWIS and Imperial College London.

The methodology employed in the first cycle of audit has not been replicated in this round of audit, and therefore, like-for-like comparisons have not been undertaken. Essentially, in the first round of audit the denominator used was all people on the COPD register, as determined by the use of QOF

codes. Recent work looking at the accuracy of COPD coding with respect to the QOF register has shown that use of other Read codes (ie not necessarily included on the register) is more suggestive of COPD with high positive predictive value, and equally, some of the codes used in QOF do not have a high sensitivity for identifying people with COPD.<sup>2,3</sup> Therefore, in this audit, the denominator population is likely to be more accurate (potentially excluding some of the people on the QOF register, but also including others that are not), than if we had simply included people on the COPD QOF register. It is intended that this improved process will be replicated in any future rounds of audit, thus providing assurance on future measurement to determine change.

Where methodologies for numerator derivation have also differed considerably, the rationale is provided. For example, in the case of COPD exacerbations, where the codes are used inconsistently, similar work has shown that using proxy codes such as prescription of oral prednisolone, and chest infection diagnosis codes can be used to derive exacerbation rates.<sup>2,7</sup>

The Read codes were tested in a pilot extraction in June 2017, and the Read code list was amended based on the findings.

Both the audit queries and final Read code list are available on the audit website ([www.rcplondon.ac.uk/projects/outputs/national-copd-primary-care-audit-wales-2015-17-resources](http://www.rcplondon.ac.uk/projects/outputs/national-copd-primary-care-audit-wales-2015-17-resources)).

## **Analysis and cleaning methodology**

Imperial College London employed the methodology below when analysing the data supplied by NWIS.

General notes:

- Whenever an audit query related to the 'past year' the team looked at the previous 15 months, to allow some leeway for general practice teams to complete their annual work.

### **Section 1: Patient demographics**

Patients without data in both event data files were removed from cohort, as these patients were much older and presumed dead.

#### **1.3 Comorbidities:**

##### ***Painful conditions:***

- i Defined as patients who had a record of four or more prescription analgesia medications in the past 12 months, or four or more specified anti-epileptics in the absence of an epilepsy Read code in the past 12 months.

##### ***The proportion of patients with COPD who have been screened for depression and anxiety, or who have been diagnosed with these conditions, in the past 2 years:***

- i Patients who declined were considered to be screened.
- ii Two years were defined as 2×365.25 days.

## Section 2: Getting the diagnosis right

### 2.1.1 The percentage of people diagnosed with COPD in the past 2 years who have a post-bronchodilator FEV1/FVC (latest ever recorded) $\geq 0.2$ and $< 0.7$ (consistent with airways obstruction):

- i Values under 0.2 were changed to missing or NULL values
- ii Values over one were divided by 100 if possible
- iii Invalid results (such as 2016) were replaced with NULL values
- iv Most recent value was used
- v Worst case scenario (ie lower value) was used for same-day events
- vi The subanalyses were conducted as follows:
  - a No 339m code:  
Denominator = patients diagnosed in the past 2 years  
Numerator = those without a 339m code.
  - b 339m is  $\geq 0.2$  and  $< 0.7$   
Denominator = patients diagnosed in the past 2 years  
Numerator = those with a 339m code where ratio recorded between 0.2 and 0.7.
  - c 339m invalid or  $\geq 0.7$   
Denominator = patients diagnosed in the past 2 years  
Numerator = those with a 339m code, but where it was a ratio  $\geq 0.7$  or invalid (ie no ratio recorded, or the ratio was  $< 0.2$ ).

### 2.1.2 Spirometry: The percentage of people diagnosed with COPD in the past 2 years who have any spirometry code (including 339m) with a result of $\geq 0.2$ and $< 0.7$ :

- i Using all Read codes: 339m, 339M, 3399, 339j, 339k, 339l, 339R, 339T, 339U, 339O1.
- ii The same methodology was employed as for 2.1.1.

### 2.2 The percentage of people with COPD who had a chest X-ray or CT scan 6 months prior to diagnosis or within 6 months of diagnosis (for diagnoses made in the past 2 years):

Six months were defined as  $365.25/2$  days.

## Section 3: Assessing severity and future risk

### 3.1 The proportion of people with COPD with MRC scores 1, 2, 3, 4, 5 and 'not recorded' in the past year:

One year (15 months) was defined as  $1.25 \times 365.25$  days.

### 3.2 The proportion of people with COPD who have a measure of FEV1 %-predicted value recorded in the past year:

Patients who have received a record with a Read code of either '339S' or '339S0' in the past 15 months ( $1.25 \times 365.25$  days).

### 3.3 The proportion and status of people with COPD who were asked about tobacco smoking in the past year:

- i This includes patients who have a record indicating that they are either a current, ex-, or never smoker in the past 15 months ( $1.25 \times 365.25$  days).

- ii For patients who had two different smoking statuses recorded on the same day, the worst case was used (ie current smoker over ex-smoker, ex-smoker over never smoker).
- iii The analysis includes the category 'not asked about smoking in past year'.

### 3.4 exacerbation count in the past year:

- i Any events before COPD diagnosis were excluded.
- ii 1 year (15 months) was defined as 1.25×365.25 days.
- iii If there was no evidence of exacerbations, it was assumed that the patient had no exacerbations.
- iv Exacerbation count is coded as 0, 1, 2, >2.

#### 3.4.1 Using validated method<sup>2,5,6,7</sup>:

- i Exacerbation events were defined as one of the following:
  - a an LRTI code
  - b an exacerbation code
  - c oral steroid and antibiotic prescriptions on the same day<sup>3</sup>
 And there must be at least 14 days between each event for them to be considered separate events.
- ii Four practices are excluded from the results for this variable, as they had no LRTI data.

#### 3.4.2 GP recorded:

- i 11,840 out of 426,452 (2.7%) cumulative exacerbation codes had no count data.
- ii GP-recorded exacerbation events were counted with the assumption that events closer than 14 days together were multiple recordings of the same exacerbation.<sup>3</sup> If the GP-recorded yearly total (66YF) was greater than 26, then the sum of GP-recorded exacerbation events (Read codes H3122, H3y0 and H3y1) was used instead.
- iii The greater value between the sum of GP-recorded exacerbation events (Read codes H3122, H3y0 and H3y1) and GP-recorded exacerbation count (Read code 66YF) for the past year was chosen as the exacerbation count for the past year.

### 3.5 Oxygen: management and treatment

***People with stable COPD and a persistent resting stable oxygen saturation level of 92% or less in the past 2 years who have evidence of an arterial blood gas measurement or referral for home oxygen assessment:***

- i Denominator: anyone with at least one record indicating oxygen saturation of 92% or below recorded in the past 2 years.
- ii Numerator: anyone from the denominator who has an oxygen assessment or oxygen therapy code.

***Patients with a record of oxygen therapy in the past 6 months:***

- i 6 months defined as 365.25/2 days
- ii Denominator: all patients
- iii Numerator: any patient with a Read code indicating oxygen therapy in the past 6 months.

## Section 4: Providing high value care

### 4.1 People with COPD who are prescribed an inhaler who have evidence of an inhaler technique check in the past year:

- i Events before COPD diagnosis were removed.
- ii Denominator: patients with a prescription for an inhaler.
- iii Numerator (inhaler check in the past year): patients from denominator with an inhaler technique check code in the 1.25×365.25 days prior to the extraction date (31 March 2017).

### 4.2 The proportion of patients with COPD who have had the influenza immunisation in the preceding 1 August to 31 March:

All patients were included in the denominator, including exception-reported patients.

### 4.3 The proportion of people with COPD who were recorded as a current smoker at any time in the past 2 years who have received or had a referral to a behavioural change intervention and had a stop smoking drug prescribed:

- i Denominator: patients with a current smoker code in the past 2 years (2×365.25 days).
- ii Numerator: patients from the denominator with a code for a behavioural change intervention *and* a code for a stop smoking drug prescription.

## 4.4 Pulmonary rehabilitation

### 4.4.1 Proportion of people with COPD who are breathless (any MRC score) and have been referred to PR in the past 3 years:

- i Denominator: any patient with an MRC score who doesn't have an exception code for PR.
- ii Numerator: any patient from the denominator who has a code for PR in the past 3 years (3\*365.25 days).

### 4.4.2 Proportion of people with COPD with MRC scores 3–5 and have been referred to PR in the past 3 years

- i Denominator: any patient with an MRC score 3–5 who doesn't have an exception code for PR
- ii Numerator: any patient from the denominator who has a code for PR in the past 3 years (3\*365.25 days).

### 4.5 Use of inhaled therapies in the past 6 months of the audit period:

- i Past 6 months defined as the 365.25/2 days prior to extraction date (31 March 2017).
- ii Specific therapy type (including triple therapy, LABA and LAMA combination) at individual level was generated as follows:
  - a Patients are considered to be on triple therapy if they ever have a LABA + ICS and LAMA prescription on the same day.
  - b Patients are considered to be on LABA and LAMA combination therapy if they aren't on triple therapy (as defined in 'a' above) and ever have a LABA and LAMA prescription on the same day.
  - c Patients who do not meet either definition 'a' or 'b' above are considered to be on whichever therapy is their most recent prescription. Of these, any who have multiple



prescriptions as their most recent, the rank for choice is: ICS, LABA, LABA + ICS, LAMA, meaning that a patient would be considered to be on ICS therapy if they had ICS and LAMA prescriptions as their most recent.

#### **4.5.1 Patients issued prescription for inhaled therapy in the past 6 months**

- i Denominator: all patients
- ii Numerator: those on inhaled therapies (ie any) in the past six months

#### **4.5.2 Types of inhaled therapy prescribed to patients in the past 6 months**

- i Denominator: patients prescribed inhaled therapies in the past six months (numerator from 4.5.1)
- ii Numerator: patients on each kind of inhaled therapy using methodology outlined above.

### **Section 5: Ensuring equal and equitable care**

#### **5.1. Patients with serious mental illness (SMI)**

- i Exposure group: all patients with a serious mental illness Read code (bipolar disorder or schizophrenia) ever recorded.
- ii Comparison group: all patients without SMI.

#### **5.2 Patients who currently smoke**

- i Exposure group: all patients with a current smoker Read code on their record (ie they had been listed as 'current smoker' in 3.3).
- ii Comparison group: patients who have not been listed as a current smoker in the past 4 years.

#### **5.3 Patients from a lower socioeconomic group**

- i Welsh Index of Multiple Deprivation (WIMD)<sup>h</sup> scores were automatically computed from home postcode as recorded in general practice records at the time of the data extraction. Please note that WIMD scores were not available for all patients and these patients were excluded from the analysis.
- ii The ranking was as follows:
  - a WIMD 1 – 10% most deprived
  - b WIMD 2 – 10–20% most deprived
  - c WIMD 3 – 20–30% most deprived
  - d WIMD 4 – 30–50% most deprived
  - e WIMD 5 – 50% least deprived

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<sup>h</sup> The WIMD uses eight types of deprivation domains, to construct deprivation rankings for all Lower layer Super Output Areas (LSOAs) in Wales. These domains are income, employment, health, education, access to services, community safety, physical environment and housing.<sup>h</sup>

## Appendix D: Participating clusters and practices

Abertawe Bro Morgannwg University Health Board		
Cluster	Practice(s)	
<b>Afan</b>	Afan Valley Group Practice	Cwmavon Health Centre (Dr Huw Browning)
	Cwmavon Health Centre (Dr Penney)	Cymmer Surgery
	Fairfield Medical Centre	King's Surgery
	Mount Surgery	Riverside Surgery
<b>BayHealth</b>	Gower Medical Practice	Kings Road Surgery (Swansea)
	St Thomas Surgery (Swansea)	The Grove Medical Centre
	The Mumbles Medical Practice	The Surgery (Sketty)
	Uplands Surgery	
<b>Bridgend East Network</b>	Ashfield Surgery	Newcastle Surgery
	Oak Tree Surgery	Riversdale House
	The Medical Centre (Pencoed)	The New Surgery (Pencoed)
<b>Bridgend North Network</b>	Bron y Garn Surgery	Llynfi Surgery
	New Street Surgery	New Surgery (Pontycymmer)
	Ogmore Vale Surgery	The Surgery (Nantymoel)
	Tynycoed Surgery	Woodlands Surgery
<b>Bridgend West Network</b>	Dr T D Eales Surgery	Heathbridge House
	The Portway Surgery	The Surgery (North Cornelly)
<b>CityHealth</b>	Brunswick Health Centre	Greenhill Medical Centre
	High Street Surgery	Kingsway Surgery
	Mayhill Surgery	Nicholl St Medical Centre
	SA Medical Centre	The Harbourside Health Centre
<b>Cwmtawe</b>	Clydach Primary Care Centre	Llwyn Brwydrau Surgery
	New Cross Surgery	Strawberry Place Surgery
	Sway Road Surgery	
<b>Llwchwr</b>	Gowerton Medical Centre	Pen y Bryn Surgery
	Princess Street Surgery	Talybont Surgery
	Ty'r Felin Surgery	
<b>Neath</b>	Alfred Street Surgery	Briton Ferry Health Centre (Dr H Wilkes and partners)
	Castle Surgery	Dyfed Road Health Centre
	Skewen Medical Centre	Tabernacle Surgery
	Victoria Gardens Surgery	Waterside Medical Practice
<b>Penderi</b>	Cheriton Medical Centre	Cwmfelin Medical Centre
	Fforestfach Medical Centre (Dr Powell)	Fforestfach Medical Centre (Dr Rees)
	Manselton Surgery	
<b>Upper Valleys</b>	Amman Tawe Partnership (Cwm)	Dulais Valley Primary Care Centre
	Pontardawe Health Centre	Vale of Neath Practice
Aneurin Bevan Health Board		
Cluster	Practice(s)	
<b>Blaenau Gwent East</b>	Abertillery Group Practice	Blaen-y-Cwm Surgery
	Blaina Medical Practice	Cwm Calon
	Six Bells Medical Centre	
<b>Blaenau Gwent West</b>	Cwm Health Centre	Glan yr Afon Surgery
	Glanrhyd Surgery	Glyn Ebwy Surgery

	Health Centre (Tredegar)	Pen-y-Cae Surgery
<b>Caerphilly East</b>	Avicenna Medical Centre	North Celynen (Crumlin)
	Pontllanfraith Health Centre	Risca Surgery
	St. Luke's Surgery	Sunnybank Health Centre
	Wellspring Medical Centre	
<b>Caerphilly North</b>	Bargoed Hall Family Health Centre	Bryntirion Surgery
	Markham Medical Centre	Meddygfa Cwm Rhymni Practice
	Meddygfa Gelligaer Surgery	Nelson Surgery
	Oakfield Surgery	South Street Surgery
	The Health Centre (Dr Ali)	The Health Centre (Dr Mahto)
	The Lawn Medical Practice	
<b>Caerphilly South</b>	Court House Medical Centre	Lansbury Surgery
	Meddygfa Tridwr	Nantgarw Road Medical Centre
	The Village Surgery	Tonyfelin Medical Centre
	Ty Bryn Surgery	
<b>Monmouthshire North</b>	Castle Gate Medical Practice (Monmouth)	Dixton Road Surgery
	Hereford Road Surgery	Old Station Surgery
	The Medical Centre (Usk)	The Surgery (Usk)
	Tudor Gate Surgery	Wye Valley Practice
<b>Monmouthshire South</b>	Gray Hill Surgery	Mount Pleasant Practice
	Wydean Practice	Vauxhall Surgery
<b>Newport East</b>	Beechwood Primary Care	Eveswell Surgery
	Lliswerry Medical Centre	Park Surgery (Newport)
	Ringland Health Centre	The Rugby Surgery
	Underwood Health Centre	
<b>Newport North</b>	Grange Clinic	Isca Medical Centre
	Malpas Brook Health Centre	Richmond Clinic
	St Julians Medical Centre	The Rogerstone Practice
<b>Newport West</b>	Bellevue Surgery	Bryngwyn Surgery
	St David's Clinic	St. Brides Medical Centre
	St. Paul's Clinic	
<b>Torfaen North</b>	Blaenavon Medical Practice	Churchwood Surgery
	Panteg Health Centre	The Mount Surgery
	The Surgery (Abersychan)	Trosnant Lodge
<b>Torfaen South</b>	Clark Avenue Surgery	Cwmbran Village Surgery
	Fairwater Medical Centre	Greenmeadow Surgery
	Llanyravon Surgery	New Chapel Street Surgery
	Oak Street Surgery	
<b>Betsi Cadwaladr University Health Board</b>		
<b>Cluster</b>	<b>Practice(s)</b>	
<b>Anglesey</b>	Cambria Surgery	Canolfan Iechyd Amlwch
	Coed Y Glyn Surgery	Gerafon Surgery
	Meddygfa Star Surgery	Meddygfa Victoria
	Parc Glas Surgery	The Health Centre (Llanfairpwll)
	The Health Centre (Ynys Mon)	The Surgery (Gwalchmai)
	The Surgery (Holyhead)	
<b>Arfon</b>	Bodnant	Bron Derw Medical Centre
	Corwen House	Dolwenith
	Felinheli & Porthaethwy Surgery	Glanfa

	Liverpool House	Market Street Surgery
	The Surgery (Llanberis)	Yr Hen Orsaf Medical Centre
<b>Central and South Denbighshire</b>	Beech House Surgery	Berllan Surgery
	Bronffynnon Surgery	Middle Lane Surgery
	Pen-y-Bont Surgery	Plas Meddyg
	The Clinic (Ruthin)	The Health Centre (Corwen)
<b>Central Wrexham</b>	Beechley Medical Centre	Borras Park Surgery
	Caia Park Surgery	Hillcrest Medical Centre (Wrexham)
	Plas Y Bryn Medical Centre	Strathmore Medical Practice
	The Surgery (Wrexham)	
<b>Conwy East</b>	Cadwgan Surgery	Kinmel Bay Medical Centre
	Rhoslan	Rysseldene Surgery
	The Gwrych Medical Centre	
<b>Conwy West</b>	Bodreinallt	Craig Y Don Medical Practice
	Llys Meddyg (Conwy)	Lonfa
	Meddygfa (Betwy y Coed)	Meddygfa Gyffin
	Mostyn House Medical Practice	Plas Menai Surgery
	The Medical Centre (Penrhyn Bay)	The Surgery (Llanwrst)
	Uwchaled Medical Practice	West Shore Surgery
<b>Dwyfor</b>	Meddyg Care	Meddygfa Rhydbach
	The Health Centre (Criccieth)	Treflan
	Ty Doctor	
<b>Meirionnydd</b>	Bron Meirion	Caerffynnon
	Meddygfa (Bala)	Minfor Surgery
	Tywyn Health Centre	
<b>North and West Wrexham</b>	Alyn Family Doctors	Bryn Darland Surgery
	Caritas Health Partnership	Forge Road Surgery
	Pen Y Maes Health Centre	The Health Centre (Coedpoeth)
<b>North Denbighshire</b>	Clarence Medical Centre	Healthy Prestatyn Iach (Ffordd Pendyffryn)
	Kings House Surgery	Lakeside Medical Centre
	Madryn House Surgery	Park House Surgery
<b>North East Flintshire</b>	Deeside Medical Centre	Marches Medical Practice
	Queensferry Medical Practice	Shotton Lane Surgery
	St Mark's Dee View Surgery	The Quay Health Centre (Dr Harney)
	The Quay Health Centre (Dr Lodhi)	
<b>North West Flintshire</b>	Bodowen Surgery	Eyton Place Surgery
	Panton Surgery	Pendre Surgery (Holywell)
	Pennant Surgery	The Laurels Surgery
<b>South Flintshire</b>	Bradley's Practice	Bromfield Medical Centre
	Caergwrle Medical Practice	Hope Family Medical Centre
	Leeswood Surgery	Pendre Surgery (Mold)
	Roseneath Medical Practice	
<b>South Wrexham</b>	Canofan Iechyd Llangollen Health Centre	Castle Health Care
	Crane Medical Centre	Ruabon Medical Centre
	The Health Centre (Beech Avenue)	The Surgery (Gardden Road)
	The Surgery (Hanmar)	The Surgery (Overton On Dee)

<b>Cardiff &amp; Vale University Health Board</b>		
<b>Cluster</b>	<b>Practice(s)</b>	
<b>Cardiff East</b>	Llanedeyrn Health Centre	Llanrumney Medical Group
	Rumney Primary Care Centre	Willowbrook Surgery
<b>Cardiff North</b>	Birchgrove Surgery	Cathedral View Medical Centre
	Crwys Medical Centre	Cyncoed Medical Practice
	Llanishen Court Surgery	North Cardiff Medical Centre
	Roath House Surgery	St Isan Road Surgery
	St Davids Medical Centre	The Penylan Surgery
	Whitchurch Road Surgery	
<b>Cardiff South East</b>	Cathays Surgery	Clifton Surgery
	Four Elms Medical Centre	North Road Medical Practice
	Roathwell Surgery	The City Surgery
<b>Cardiff South West</b>	Ely Bridge Surgery	Greenmount Surgery
	Kings Road Surgery (Cardiff)	Meddygfa Lansdowne Surgery
	Riverside HC Canton	Westway Surgery
	Woodlands Medical Centre	
<b>Cardiff West</b>	Danescourt Surgery	Fairwater Health Centre
	Llandaff North Medical Centre	Llandaff Surgery
	Meddygfa Llwyncelyn Practice	Radyr Medical Centre
	Whitchurch Village Practice	
<b>Central Vale</b>	Court Road Surgery	Highlight Park Medical Practice
	Sully Surgery	The Practice Of Health
	The Vale Family Practice	The Waterfront Medical Centre
	West Quay Medical Centre	
<b>City and Cardiff South</b>	Clare Road Medical Centre	Grange Medical Practice
	Grangetown Health Centre	Saltmead Medical Centre
	The Surgery (Grangetown)	
<b>Eastern Vale</b>	Dinas Powys MC	Stanwell Surgery
	Station Road Surgery	
<b>Western Vale</b>	Eryl Surgery	Western Vale Family Practice
<b>Cwm Taf Health Board</b>		
<b>Cluster</b>	<b>Practice(s)</b>	
<b>North Cynon</b>	Cwmaman Surgery	Foundary Town Clinic
	Maendy Place Surgery	Park Surgery (Aberdare)
	The Health Centre (Hirwaun)	
<b>North Merthyr Tydfil</b>	Kier Hardey Health Park (Dr J Davies)	Kier Hardy Health Park (Dr Jayadev)
	Kier Hardy Health Park (Dr NANNAPANENI)	Morlais Medical Practice
<b>North Rhondda</b>	Forest View Medical Centre	New Tynewydd Surgery
	The Maerdy Ferndale Mgp	The Surgery (Ton Pentre)
<b>North Taf Ely</b>	Eglwys Bach Surgery	Taf Vale Practice
	The Ashgrove Surgery	Ynysybwl Surgery
<b>South Cynon</b>	Cynon Vale Medical Practice (Cardiff Road)	Hillcrest Medical Centre (Mountain Ash)

	Rhos House Surgery	The Health Centre (Abercynon)
	The Penrhiwceiber Medical Centre	
<b>South Merthyr Tydfil</b>	Brookside Medical Centre	Pontcae Medical Practice
	The Surgery (Bedlinog)	Treharris Primary Health Care
	Troed Y Fan Medical Practice (Aberfan)	
<b>South Rhondda</b>	Cwm Gwrydd Medical Centre	Llwynypia Medical Practice
	Pont Newydd Medical Centre	Porth Farm Surgery
	St. Andrews Surgery	The Health Centre (Tonypandy)
	The Surgery (Penygraig)	
<b>South Taf Ely</b>	Old School Surgery	Parc Canol Group Practice
	Talbot Green Group Practice	The Health Centre (Taffs Well)
<b>Hywel Dda Health Board</b>		
<b>Cluster</b>	<b>Practice(s)</b>	
<b>Amman/Gwendraeth</b>	Amman Tawe Partnership (Gwaun Cae Gurwen)	Brynteg Surgery
	Coalbrook Surgery	Meddygfa Minafon
	Meddygfa Penygroes	Meddygfa'r Tymbl
	The Surgery (Ammanford)	
<b>Llanelli</b>	Ashgrove Medical Centre	Avenue Villa Surgery
	Fairfield Surgery	Meddygfa Tywyn Bach
	The Llwynhendy Health Centre	The Surgery (Llangennech)
	Ty Elli Group Practice	
<b>North Ceredigion</b>	Borth Medical Practice	Church Surgery
	Llanilar Health Centre	Padarn Surgery
	Tanyfron Surgery	Tregaron Surgery
	Ystwyth Primary Care Centre	
<b>North Pembrokeshire</b>	Barlow House Surgery	Meddygfa Wdig
	Newport Surgery	St David's Surgery
	St Thomas Surgery (Haverfordwest)	The Health Centre (Fishguard)
	The Robert Street Practice	The Surgery (Solva)
	Winch Lane Surgery	
<b>South Ceredigion</b>	Ashleigh Surgery	Cardigan Health Centre
	Lampeter Medical Practice	Llynyfran Surgery
	Meddygfa Emlyn	Meddygfa Teifi Surgery
	The Surgery (New Quay)	
<b>South Pembrokeshire</b>	Argyle Medical Group	Narberth Surgery
	Neyland Health Centre	Saundersfoot Medical Centre
	The Surgery (Tenby)	
<b>Taf/Teifi/Tywi</b>	Coach and Horses Surgery	Meddygfa Teilo
	Furnace House Surgery	Meddygfa Taf
	St Peter's Surgery	Llanfair Surgery (Llandovery)
	Meddygfa Tywi	Morfa Lane Surgery

Powys Teaching Health Board		
Cluster	Practice(s)	
Mid Powys	Llandrindod Wells Medical Practice	Presteigne Medical Practice
	The Surgery (Rhayader)	Wylcwm Street Surgery
North Powys	Arwystli Medical Practice	Canolfan Iechyd Glantwymyn
	Llanfair Caereinion Medical Practice	Montgomery Medical Practice
	Newtown Medical Practice	Welshpool Medical Practice
South Powys	Ty Henry Vaughan	War Memorial Health Centre
	Ystradgynlais Group Practice	

## Appendix E: Current members of the primary care workstream group

- **Noel Baxter**, National COPD Audit Programme Clinical Lead – primary care workstream; and GP Clinical Lead, NHS Southwark CCG
- **Mark Allen**, Practice Pharmacist, North Cardiff Medical Centre
- **Simon Barry**, Respiratory Lead for the Wales Respiratory Health Implementation Group
- **Claire Campbell**, Lead for the Royal College of General Practitioners
- **Joseph Carter**, Head of Wales, British Lung Foundation Wales
- **Grainne d’Anonca**, Principal Pharmacist for Acute Medicine, Guy’s and St Thomas’ NHS Foundation Trust; and Honorary Clinical Lecturer, King’s College London
- **Anthony Davies**, Welsh Government Lead (Deputy)
- **Sion Edwards**, Audit Lead, Primary Care Quality, Public Health Wales
- **Kevin Gruffydd-Jones**, Respiratory Lead, Royal College of General Practitioners; Clinical Policy Lead, Primary Care Respiratory Society UK; Honorary Lecturer at University of Bath; and General Practitioner (GP)
- **Juliana Holzhauser-Barrie**, National COPD Audit Project Manager, Care Quality Improvement Department, Royal College of Physicians, London
- **Joe Hunt**, NHS Wales Informatics Service Lead (Deputy)
- **Rhys Jefferies**, Programme Manager, Wales Respiratory Health Implementation Group
- **Simon Kendrick**, Clinical Commissioning Group Representative, Greater East Midlands Commissioning Support Unit
- **Viktoria McMillan**, National COPD Audit Programme Manager, Care Quality Improvement Department, Royal College of Physicians, London
- **Jennifer Quint**, Clinical Senior Lecturer in Respiratory Epidemiology, Occupational Medicine and Public Health, National Heart and Lung Institute, Imperial College London; and Honorary Consultant Physician in Respiratory Medicine, Royal Brompton Hospital, London
- **Imran Rafi**, Chair of the Clinical Innovation and Research Centre, Royal College of General Practitioners; Senior Lecturer in Primary Care, St George’s University of London; and GP
- **James Riordan**, National COPD Audit Programme Coordinator, Care Quality Improvement Department, Royal College of Physicians, London
- **C Michael Roberts**, National COPD Audit Programme Clinical Lead; and Clinical Academic Lead for Population Health, UCL Partners
- **Sophie Robinson**, National COPD Audit Programme Coordinator, Care Quality Improvement Department, Royal College of Physicians, London
- **Philip Stone**, Research Assistant in Statistics/Epidemiology, National Heart and Lung Institute, Imperial College London
- **Simon Scourfield**, Primary Care Informatics Lead, NHS Wales Informatics Service
- **Sarah Sibley**, Consultant Chest Physician, Liverpool Heart and Chest Hospital NHS Foundation Trust
- **Elizabeth Steed**, Lecturer in Health Psychology and Research Design Services Adviser, Queen Mary’s University London
- **Michael Steiner**, National COPD Audit Programme Clinical Lead – pulmonary rehabilitation workstream; Honorary Clinical Professor at Loughborough University; and Consultant Respiratory Physician, University Hospitals of Leicester NHS Foundation Trust
- **Robert A Stone**, National COPD Audit Programme Clinical Lead – secondary care workstream; and Consultant Respiratory Physician, Taunton and Somerset NHS Foundation Trust
- **Carol Stonham**, Senior Nurse Practitioner, Minchinhampton Surgery, Gloucestershire CCG; and Nurse Lead for the Primary Care Respiratory Society UK



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