A Report from Public Health Wales
Healthcare Associated Infection, Antimicrobial Resistance & Prescribing Programme (HARP team)

Antibacterial Usage in Primary Care
In Wales 2014/15 - 2018/19
## Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section 1: Introduction</td>
<td>3</td>
</tr>
<tr>
<td>Section 2: Key points of interest</td>
<td>4</td>
</tr>
<tr>
<td>Section 3: Methods</td>
<td>6</td>
</tr>
<tr>
<td>Data sources</td>
<td>6</td>
</tr>
<tr>
<td>Data presentation</td>
<td>6</td>
</tr>
<tr>
<td>Data Interpretation</td>
<td>7</td>
</tr>
<tr>
<td>Section 4.1: Primary Care Improvement Goals</td>
<td>8</td>
</tr>
<tr>
<td>Improvement Goal for 2018/19</td>
<td>8</td>
</tr>
<tr>
<td>Improvement Goal for 2023/24</td>
<td>9</td>
</tr>
<tr>
<td>Section 4.2: All-Wales level antibacterial usage</td>
<td>10</td>
</tr>
<tr>
<td>All-Wales Antibacterial Usage 2018/19</td>
<td>10</td>
</tr>
<tr>
<td>Trends in All-Wales Antibacterial Usage (2014/15 – 2018/19)</td>
<td>12</td>
</tr>
<tr>
<td>Comparing All-Wales Antibacterial Usage (2017/18 &amp; 2018/19)</td>
<td>19</td>
</tr>
<tr>
<td>Section 4.3: Health Board level antibacterial usage</td>
<td>20</td>
</tr>
<tr>
<td>Antibacterial Usage in Welsh HBs and English CCGs</td>
<td>20</td>
</tr>
<tr>
<td>Trends in Health Board Antibacterial Usage (2014/15 – 2018/19)</td>
<td>21</td>
</tr>
<tr>
<td>Comparing Health Board Antibacterial Usage (2017/18 &amp; 2018/19)</td>
<td>22</td>
</tr>
<tr>
<td>Abertawe Bro Morgannwg UHB</td>
<td>23</td>
</tr>
<tr>
<td>Aneurin Bevan UHB</td>
<td>24</td>
</tr>
<tr>
<td>Betsi Cadwaladr UHB</td>
<td>25</td>
</tr>
<tr>
<td>Cardiff &amp; Vale UHB</td>
<td>26</td>
</tr>
<tr>
<td>Cwm Taf UHB</td>
<td>27</td>
</tr>
<tr>
<td>Hywel Dda UHB</td>
<td>28</td>
</tr>
<tr>
<td>Powys THB</td>
<td>29</td>
</tr>
<tr>
<td>Section 4.4: GP Cluster level antibacterial usage</td>
<td>30</td>
</tr>
<tr>
<td>Abertawe Bro Morgannwg UHB</td>
<td>30</td>
</tr>
<tr>
<td>Aneurin Bevan UHB</td>
<td>33</td>
</tr>
<tr>
<td>Betsi Cadwaladr UHB</td>
<td>36</td>
</tr>
<tr>
<td>Cardiff &amp; Vale UHB</td>
<td>39</td>
</tr>
<tr>
<td>Cwm Taf UHB</td>
<td>42</td>
</tr>
<tr>
<td>Hywel Dda UHB</td>
<td>45</td>
</tr>
<tr>
<td>Powys THB</td>
<td>48</td>
</tr>
<tr>
<td>Section 5: Useful links</td>
<td>51</td>
</tr>
</tbody>
</table>
Section 1: Introduction

In 2014, Lord O’Neill was commissioned by the UK Prime Minister to review the global impact of antimicrobial resistance. He estimated that by 2050, 10 million lives a year and a cumulative 100 trillion USD of economic output would be at risk due to the rise of drug resistant infections if no proactive solutions were found now to slow down the rise of drug resistance.

In response to Lord O’Neill’s report and recommendations, in January 2019, the UK Government published its 20-year vision for antimicrobial resistance, and its five-year national action plan to tackle antimicrobial resistance. The vision is that stakeholders at local, national, and global levels collectively strengthen policy and practice, improve research and surveillance, and develop effective regulation to contain and control resistance.

Antimicrobial resistance is an increasing problem in Wales and has already led to a small number of difficult to treat infections, leading to failed therapy and potential complications. Treatment for most infections is started empirically before antimicrobial susceptibilities are known. A particular problem with the spread of antimicrobial resistance is that it becomes more difficult to select empirical therapy that will have reliable activity.

In Primary Care, the effects are most clearly seen in increasing resistance to empirical therapy in urinary pathogens. There is also on-going concern about Clostridium difficile associated disease arising in the community. The main driver for the spread of both resistance and C. difficile is antimicrobial use; certain antibacterial agents have been particularly implicated in the spread of C. difficile.

In response to this threat to the health of the people of Wales, Welsh Government introduced antimicrobial prescribing improvement goal for the 2018/19 financial year (WHC/2018/020), and for the 2023/24 financial year (WHC/2019/019),

This report shows continuing progress in improving and reducing antibacterial use in GP Practice in Wales. There has been a sustained reduction in the use of agents used for treatment of respiratory infection (amoxicillin and macrolides), those associated with C. difficile (cephalosporins, fluoroquinolones and co-amoxiclav), and trimethoprim usage for urinary tract infection in older age groups (in response to increasing resistance).

There is however, significant variability between Health Boards and GP Clusters in both the amount and types of antibacterials used, which suggests that there remains room for improvement. The aim of this report is to provide ‘information for action’ in support of the UK AMR 20-year vision for antimicrobial resistance and the Welsh Government 2023/24 improvement goals.
Section 2: Key points of interest

- In May 2018, Welsh Government introduced antimicrobial prescribing improvement goals for the 2018/19 financial year. The goal for primary care was a **5% reduction** in total antimicrobial volume compared to the baseline year of 2016/17. All seven Health Boards exceeded the reduction target:
  - Abertawe Bro Morgannwg UHB 6.0% reduction
  - Aneurin Bevan UHB 9.2% reduction
  - Betsi Cadwaladr UHB 12.6% reduction
  - Cardiff & Vale UHB 10% reduction
  - Cwm Taf UHB 6.6% reduction
  - Hywel Dda UHB 8.8% reduction
  - Powys THB 10.2% reduction

- In July 2019, Welsh Government introduced antimicrobial improvement goals for the 2023/24 financial year ([WHC/2019/019](#)). The goal for primary care is a minimum **25% reduction** in total antimicrobial volume compared to the baseline year of 2013/14. All seven Health Boards (01 April 2019 structure) are showing varying degrees of progress towards the 25% reduction target:
  - Aneurin Bevan UHB 17.4% reduction
  - Betsi Cadwaladr UHB 23.0% reduction
  - Cardiff & Vale UHB 21.1% reduction
  - Cwm Taf Morgannwg UHB 10.9% reduction
  - Hywel Dda UHB 16.2% reduction
  - Powys THB 18.3% reduction
  - Swansea Bay UHB 17.9% reduction

- This report details the changes in prescribing over the past 5 years: During the 5-year period, 2014/15 to 2018/19, there was a **17.7% reduction** in total antibacterial usage across the GP practices in Wales, suggesting the creation of GP clusters in April 2014 has benefitted antimicrobial stewardship.

- In 2018/19, the total volume of antibacterials items dispensed for GP practices in Wales was 1120.5 items/ 1000 STAR-PUs; showing a **7% reduction** in usage compared with the 2017/18 financial year.

- In 2018/19, there was a reduction in total antibacterial usage in all seven Health Boards, compared with the previous year.
  - Abertawe Bro Morgannwg UHB 4.4% reduction
  - Aneurin Bevan UHB 7.5% reduction
  - Betsi Cadwaladr UHB 7.2% reduction
  - Cardiff & Vale UHB 9.1% reduction
  - Cwm Taf UHB 6.9% reduction
  - Hywel Dda UHB 7.1% reduction
  - Powys THB 8.3% reduction
There was significant variability between GP Clusters in gross annual antimicrobial use in 2018/19, with a 38% difference in prescribing rates between the GP Cluster with highest rate of dispensed items and the GP Cluster with the lowest rate.

- South Rhondda GP Cluster had the highest dispensing rate of 1,412 items/1000 patients per annum
- Cardiff South East had the lowest dispensing rate with 874 items/1000 patients per annum.

In 2018/19, the following reductions were made:

- Amoxicillin usage 15.8% reduction
- Beta-lactamase sensitive penicillin usage 8.6% reduction (mainly phenoxymethylpenicillin)
- Cephalosporin usage 10.8% reduction
- Co-amoxiclav usage 12.8% reduction
- Fluoroquinolone usage 1.5% reduction
- Imidazole usage 6.1% reduction (mainly metronidazole)
- Macrolide usage 8.6% reduction
- Trimethoprim usage 16.3% reduction

There was a notable change in usage of key drug/drug groups

- A reduction in winter usage of amoxicillin and macrolides.
- An increase in winter usage of doxycycline, suggesting an increased use for respiratory infections in adherence to guidance.
- A reduction in usage of trimethoprim, suggesting a decreased usage for urinary tract infections in response to increasing resistance.
- An increase in the use of nitrofurantoin and pivmecillinam in line with UTI guidance.

In terms of total antibacterial use in GP practice across Wales in 2018/19,

- The commonest antibacterial type (defined by items dispensed) was broad-spectrum penicillins (mainly amoxicillin) at 22.1% of total use
- Tetracyclines (e.g. doxycycline) 17.6%
- Beta-lactamase-resistant penicillins (e.g. flucloxacillin) 12.3%
- Macrolides (e.g. clarithromycin) 11.0%
- Trimethoprim group 10.1%
- Cephalosporins and fluoroquinolones (e.g. ciprofloxacin) represented 3.0% and 2.0% of total antibiotic use respectively.
- Beta-lactam/beta-lactamase inhibitor combinations (e.g. co-amoxiclav) represented 3.1% of use.
Section 3: Methods

Data sources
Antimicrobial prescribing data was provided by the Prescribing Services Unit (PSU). PSU is part of NHS Wales Shared Service Partnership. PSU is responsible for calculating the remuneration due to community pharmacies, dispensing doctors, appliance contractors and GPs who personally administer drugs for issuing prescribed items against NHS prescriptions. The data collected during this process is also used to drive a range of information products that are provided to stakeholders across the NHS and, where applicable, made publicly available.

http://www.wales.nhs.uk/sites3/home.cfm?orgid=428

Data is collected from prescriptions that are submitted to PSU by dispensing contractors at the end of each month. Data is collected only from prescriptions that have actually been dispensed. Data is allocated to Local Health Boards on the basis of where the item is prescribed. References to “dispensed” items should therefore be read as items dispensed by community dispensing contractors against prescriptions written in the referenced Local Health Board.

Data presentation
Only antibacterial data BNF chapter 5.2 ‘Bacterial infection’ is presented in this report.

In general, data in the report is expressed as items/1000 patients, items/1000 STAR-PU, or DDD/1000 STAR-PU, and collated at the level of All-Wales, Health Board, and GP clusters. Items refer to antibacterial items that have been dispensed, and patients refer to the number of registered patients.

STAR-PU (Specific Therapeutic Group Age-sex weightings Related Prescribing Units) are an adjusted measure of population. These weighting allow more accurate and meaningful comparisons within a specific therapeutic group by taking into account the types of people who will be receiving that treatment. The current 2013 weighting by age group and gender are shown in the table below.

Table 1: STAR-PU 2013 weighting

<table>
<thead>
<tr>
<th>Age Band</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4</td>
<td>0.8</td>
<td>0.8</td>
</tr>
<tr>
<td>5-14</td>
<td>0.3</td>
<td>0.4</td>
</tr>
<tr>
<td>15-24</td>
<td>0.2</td>
<td>0.6</td>
</tr>
<tr>
<td>25-34</td>
<td>0.3</td>
<td>0.6</td>
</tr>
<tr>
<td>35-44</td>
<td>0.3</td>
<td>0.6</td>
</tr>
<tr>
<td>45-54</td>
<td>0.3</td>
<td>0.6</td>
</tr>
<tr>
<td>55-64</td>
<td>0.4</td>
<td>0.7</td>
</tr>
<tr>
<td>65-74</td>
<td>0.7</td>
<td>1.0</td>
</tr>
<tr>
<td>75+</td>
<td>1.0</td>
<td>1.3</td>
</tr>
</tbody>
</table>

Numerator divided by the denominator
Represented as number of antibacterial items per STAR PU
Data Interpretation
A number of factors should be considered when examining the data presented in this report:

- The data presented at Health Board and All-Wales level only includes GP practice level data where the numerator (items and DDDs) and denominator (patients and STAR-PU) are available. Dispensing data for other locations such as OOH, Community Resources Teams, and Incontinence Services are not included in the data set as no denominator data is available for them. As such, the data may differ from that published in SPIRA, which contains some of these data in the Health Board and Wales aggregates. [http://prescribing.wales.nhs.uk/Spira/Spira.cfm](http://prescribing.wales.nhs.uk/Spira/Spira.cfm)

- The data presented is for antimicrobial items that have been dispensed and therefore DO NOT necessarily correlate with antimicrobial prescriptions (e.g. delayed prescriptions that were not dispensed would not be included in the data set) or antimicrobial use (i.e. dispensed antimicrobial courses may not be completed by the patient).

- Differences in antimicrobial use between Local Health Boards may be due to many differences that have been shown to influence use including population health, population deprivation, or availability of dispensing practices.

- Only data for oral and parenteral antimicrobial usage are included in this report, it DOES NOT include topical, inhaled, rectal or genital preparation usage.

- It should be noted that PSU uses a drug database supplied and maintained by the NHS Business Services Authority, Prescription Pricing Division (PPD). This database does not have full coverage of Defined Daily Dose (DDD) allocations for all of the products contained therein. For the products with ATC codes used in this dataset the coverage is approximately 96%. This should be noted when considering data using DDD as a measure.

- GP practices data have been aggregated to cluster level based on the WRDS GP practice to clusters information obtained by PHW 13 April 2018.

- Historic GP practice data (pre April-2014) has been mapped to the April 2018 cluster structure in order to observe if inter-cluster collaboration influences antimicrobial stewardship.
Section 4.1: Primary Care Improvement Goals

Improvement Goal for 2018/19
In May 2018, Welsh Government introduced antimicrobial prescribing improvement goals for the 2018/19 financial year (WHC/2018/020). The goal for primary care was a 5% reduction in total antimicrobial volume compared to the baseline year of 2016/17.

Total antimicrobial volume improvement goal 2018/19
Final position for period ending March 2019

Figure 1: Difference in Total Antibacterial Usage by Health Board
Figure 1 shows the final position for the Health Boards at the end of the 2018/19 target period, with all exceeding the 5% reduction target (blue line).

- Abertawe Bro Morgannwg UHB 6% reduction
- Aneurin Bevan UHB 9.2% reduction
- Betsi Cadwaladr UHB 12.6% reduction
- Cardiff & Vale UHB 10% reduction
- Cwm Taf UHB 6.6% reduction
- Hywel Dda UHB 8.8% reduction
- Powys THB 10.2% reduction
Improvement Goal for 2023/24
In July 2019, Welsh Government introduced antimicrobial improvement goals for the 2023/24 financial year (WHC/2019/019). The goal for primary care is a 25% reduction in total antimicrobial volume compared to the baseline year of 2013/14.

Total antimicrobial volume improvement goal 2023/24
Update for period ending March 2019

Figure 2 shows the position for the Health Boards in relation to the 25% reduction target (blue line) for the period ending March 2019.

Compared with the 2013/14 baseline, the new HBs made the following reductions:

- Aneurin Bevan UHB 17.4% reduction
- Betsi Cadwaladr UHB 23.0% reduction
- Cardiff & Vale UHB 21.1% reduction
- Cwm Taf Morgannwg UHB 10.9% reduction
- Hywel Dda UHB 16.2% reduction
- Powys THB 18.3% reduction
- Swansea Bay UHB 17.9% reduction

Note: For the 2023/24 improvement goal, data is presented in the new Health Board structures of 1 April 2019.
Section 4.2: All-Wales level antibacterial usage

All-Wales Antibacterial Usage 2018/19

Key: Antibacterials within the drug group ‘Other’ include lincosamides, polymyxins, fusidic acid, aminoglycosides, glycopeptides, carbapenems, amphenicols, monobactams and streptogramins.

Figure 3: All-Wales Antibacterial Usage for 2018/19 (ITEMS)

Figure 3 shows antibacterial usage at group level for All-Wales in 2018/19:

- The data is based on the number of antibacterial ITEMS
- Broad-spectrum penicillins (BSP: predominantly amoxicillin) were the most commonly prescribed antibacterial group in 2018/19, accounting for 22.1% of total antibacterial usage in Primary Care in Wales.
- Tetracyclines, beta-lactamase (BL) resistant penicillins, macrolides, and trimethoprim/sulphonamide group (predominantly trimethoprim), accounted for a further 51% of usage
- BL inhibitor combinations (predominantly co-amoxiclav) accounted for 3.1% of total usage.
- Cephalosporins accounted for 3% of total usage.
- Fluoroquinolones accounted for 2% of total usage.
Key: Antibacterials within the drug group 'Other' include lincosamides, polymyxins, fusidic acid, aminoglycosides, glycopeptides, carbapenems, amphenicols, monobactams and streptogramins.

Figure 4: All-Wales Antibacterial Usage for 2018/19 (DDDs)

Figure 4 shows antibacterial usage at group level for All-Wales in 2018/19:

- The data is based on the number of Defined Daily Doses (DDDs).
- Tetracyclines showed the highest usage accounting for 30.1% of total antibacterial usage in Primary Care in Wales in 2018/19.
- BL inhibitor combinations accounted for 5.1% of total usage.
- Cephalosporins accounted for 1.3% of total usage.
- Fluoroquinolones (J01MA) accounted for 2.1% of total usage.

Note 1: Figures 3 and 4 show the effect of using different prescribing measures: The proportion of tetracycline use when measured as ‘items’ was 17.6%, compared to 30.1% when the measure was ‘DDDs’. The proportion of usage is much higher when using DDDs as a measure because tetracycline is often dispensed as long courses (28 day packs) for skin conditions such as acne; one dispensed item of the tetracycline ‘lymecycline’ relates to 28 DDDs whereas, one item of co-amoxiclav generally only relates to 5-7 DDDs.

Note 2: The data that follows for both Health Boards and GP clusters, presents total antibacterial usage as items/1000 STAR-PU and individual drug/drug group usage as items/1000 patients.
Figure 5: All-Wales trends in Total Antibacterial Usage

Figure 5 shows trends in total antibacterial usage for ‘All-Wales’ GP practices from quarter Apr-Jun 2014 to quarter Jan-Mar 2019. The data shows:

- A marked decrease in usage from 1361.2 items/1000 STAR-PU to 1120.5 items/1000 STAR-PU per annum (blue line).

Equating to an 17.7% reduction in total antibacterial usage for ‘All-Wales’ across the 5-year period.
Figure 6 shows trends in total antibacterial usage for ‘All-Wales’ GP practices from quarter Apr-Jun 2014 to quarter Jan-Mar 2019. The data shows:

- A marked decrease in the winter prescribing peaks suggesting a decrease in prescribing for self-limiting respiratory infections (blue line).
Figure 7: Trends in 3C Group Dispensing

Figure 7 shows trends in dispensing of 3C usage: co-amoxiclav, cephalosporins, and fluoroquinolones.

- Co-amoxiclav shows a reduction in winter peaks and a marked downward trend in usage across time.
- Cephalosporin usage shows a reduction in winter peaks and a marked downward trend in usage across time.
- Fluoroquinolones show a slowing reduction in usage.
Figure 8: Trends in Antibacterial Usage – Respiratory (quarterly data)

Figure 8 shows the trends in quarterly data for usage for antibacterials that may be prescribed for respiratory tract infections:

- Amoxicillin shows marked winter peaks and a downward trend in usage.
- Macrolide usage shows winter peaks and a downward trend in usage.
- Doxycycline shows an upward trend in usage, with increasing winter peaks, suggesting an increased use for respiratory infections.
- Co-amoxiclav shows a reduction in winter peaks and a downward trend in usage.
- Fluoroquinolones show a slowing reduction in usage.
Figure 9 shows the trends in annual data for usage for antibacterials that may be prescribed for respiratory tract infections, and shows a simpler representation of the changes in prescribing between the financial years 2014/15 and 2018/19:

- A notable reduction in amoxicillin usage from 214 to 140 items/1000 patients.
- A reduction in macrolide usage from 94 to 71 items/1000 patients.
- A reduction in co-amoxiclav usage from 33 to 20 items/1000 patients.
- A reduction in fluoroquinolone usage from 15.8 to 13.1 items/1000 patients.
- An increase in doxycycline usage from 62 to 79 items/1000 patients.
Figure 10 shows the trends in quarterly data for usage for antibacterials that may be prescribed for urinary tract infections:

- Trimethoprim shows marked summer peaks and a downward trend in usage.
- Nitrofurantoin usage shows summer peaks and an upward trend in usage.
- Co-amoxiclav shows small winter peaks and a downward trend in usage.
- First generation cephalosporins show a downward trend in usage.
- Fluoroquinolone usage shows a slowing downward trend.
- Pivmecillinam shows a small increase in usage.

Figure 10: Trends in Antibacterial Usage – Urinary
Figure 11 shows the trends in usage for agents that may be prescribed for skin and soft-tissue infection and sore throat: beta-lactamase sensitive penicillins (mainly phenoxyethylpenicillin), and flucloxacillin.

- Flucloxacillin shows marked summer peaks and a downward trend in usage.
- Beta-lactamase sensitive penicillin usage shows marked winter peaks, with a slight downward trend in the last quarter of 2018/19.
Comparing All-Wales Antibacterial Usage (2017/18 & 2018/19)

Figure 12: Difference in Antibacterial Usage

Figure 12 shows the difference in antibacterial usage comparing the financial years 2017/18 to 2018/19. The data shows:

- A 7.0% reduction in total antibacterial usage
- A 15.8% reduction in amoxicillin usage
- An 8.6% reduction in beta-lactamase sensitive penicillins usage (mainly phenoxymethylpenicillin)
- A 12.8% reduction in co-amoxiclav usage
- A 1.5% reduction in doxycycline usage
- A 0.2% increase in flucloxacillin usage
  A 6.1% reduction in imidazole usage (mainly metronidazole)
- An 8.6% reduction in macrolide usage
- A 16.4% increase in nitrofurantoin usage
- A 16.3% reduction in trimethoprim
Section 4.3: Health Board level antibacterial usage

Antibacterial Usage in Welsh HBs and English CCGs

Figure 13: Antibacterial Usage in Welsh HBs and English CCGs 2018/19 q4
Reference for figure: National Prescribing Indicators 2018-19 report, All Wales Therapeutics and Toxicology Centre (AWTTC).

Figure 13 shows the rate for dispensed antibacterial items by Health Boards in Wales and CCG in England for the quarter ending March 2019. The data shows:

- The average rate of dispensed antibacterial items were significantly higher for Wales than England, or North East England (comparable demographics to Wales).
  - Wales 305.6 items/1000 STAR-PU
  - England 254.2 items/1000 STAR-PU
  - NE England 296.1 items/1000 STAR-PU
- Cwm Taf UHB had the highest rate for dispensed antibacterial items in England and Wales for the 2018/19 q4 period.
- All of the HBs in Wales, with the exceptions of Cardiff & Vale and Powys THB, appear in the top quintile of dispensed antibacterial items.
Trends in Health Board Antibacterial Usage (2014/15 – 2018/19)

Figure 14: Health Board trends in Total Antibacterial Usage

Figure 14 shows trends in total antibacterial usage for GP practices by Health Board (HB) from quarter Apr-Jun 2014 to quarter Jan-Mar 2019. The data shows:

- Cwm Taf UHB remains the highest prescribing HB in Wales.
- All HBs show a notable decrease in total antibacterial usage across time.
- Powys THB remains the lowest prescribing HB in Wales.
Comparing Health Board Antibacterial Usage (2017/18 & 2018/19)

Figure 15: Difference in Total Antibacterial Usage by Health Board

Figure 15 shows the difference in total antibacterial usage comparing the financial years 2017/18 to 2018/19. The data shows:

- An average 7.2% reduction across the HBs in Wales.
Figure 16: ABMUHB trends in Antibacterial Usage

Figure 16 shows the trends in quarterly data for usage for the most commonly prescribed antibacterials:

- Amoxicillin shows marked winter peaks and a significant downward trend in usage.
- Macrolide usage shows winter peaks and a downward trend in usage.
- Doxycycline shows marked winter peaks.
- Cephalosporin usage has decreased slightly in 2018/19.
- Co-amoxiclav and fluoroquinolones usage has levelled off.
- Trimethoprim shows summer peaks and shows an upward trend from the second quarter of 2018/19.
- Flucloxacillin shows summer peaks and a downward trend in usage.
- Beta-lactamase sensitive penicillin (mainly phenoxyimethylpenicillin) usage shows an increase in the last quarter of 2018/19 (Jan-Mar), with marked peaks in usage in the same quarter each year.
Figure 17 shows the trends in quarterly data for usage the most commonly prescribed antibacterials:

- Amoxicillin shows marked winter peaks and a significant downward trend in usage.
- Macrolide usage shows winter peaks and a downward trend in usage.
- Doxycycline shows a marked upward trend, with increasing winter peaks.
- Cephalosporin usage shows a continuing downward trend.
- Co-amoxiclav and fluoroquinolone usage has levelled off.
- Trimethoprim shows summer peaks and a downward trend in usage.
- Flucloxacillin shows marked summer peaks and a downward trend in usage.
- Beta-lactamase sensitive penicillin (mainly phenoxymethylpenicillin) usage shows marked peaks in the Jan-Mar quarter each year and an overall increasing trend.
Figure 18: BCUHB trends in Antibacterial Usage

Figure 18 shows the trends in quarterly data for usage the most commonly prescribed antibacterials:

- Amoxicillin shows marked winter peaks and a significant downward trend in usage.
- Macrolide usage shows winter peaks and a downward trend in usage.
- Doxycycline shows a marked upward trend, with increasing winter peaks.
- Cephalosporin usage shows a continuing downward trend.
- Co-amoxiclav and fluoroquinolone usage has levelled off.
- Trimethoprim shows summer peaks and a downward trend in usage.
- Flucloxacillin shows marked summer peaks and a downward trend in usage.
- Beta-lactamase sensitive penicillin (mainly phenoxymethylpenicillin) usage shows a downward trend, with marked peaks in usage in the Jan-Mar each year.
CAVUHB trends in Antibacterial Usage

Figure 19 shows the trends in quarterly data for usage the most commonly prescribed antibacterials:

- Amoxicillin shows marked winter peaks and a significant downward trend in usage.
- Macrolide usage shows winter peaks and a downward trend in usage.
- Doxycycline shows a marked upward trend, with increasing winter peaks.
- Co-amoxiclav, cephalosporins and fluoroquinolones usage has levelled off.
- Trimethoprim shows summer peaks and a downward trend in usage.
- Flucloxacillin shows marked summer peaks and a downward trend in usage.
- Beta-lactamase sensitive penicillin (mainly phenoxyemethylpenicillin) usage shows no significant change across time, with marked peaks in the last quarter of each financial year (Jan-Mar).
Figure 20: CTUHB trends in Antibacterial Usage

Figure 20 shows the trends in quarterly data for usage the most commonly prescribed antibacterials:

- Amoxicillin shows marked winter peaks and a significant downward trend in usage.
- Macrolides usage shows marked winter peaks, with a slight downward trend.
- Doxycycline usage shows marked winter peaks, with a slight downward trend between 2017/18 and 2018/19.
- Cephalosporins and fluoroquinolones usage has levelled off.
- Co-amoxiclav usage shows a downward trend.
- Trimethoprim shows summer peaks and a downward trend in usage.
- Flucloxacillin shows summer peaks and a downward trend in usage.
- Beta-lactamase sensitive penicillin (mainly phenoxymethylpenicillin) shows marked peaks in the Jan-Mar quarter of each year, with no significant change across time.
Figure 21: HDUHB trends in Antibacterial Usage

Figure 21 shows the trends in quarterly data for usage the most commonly prescribed antibacterials:

- Amoxicillin shows marked winter peaks and a significant downward trend in usage.
- Macrolide usage shows winter peaks and a general downward trend in usage.
- Doxycycline shows a marked upward trend, which levels out in the last quarter of 2018/19.
- Co-amoxiclav, cephalosporins and fluoroquinolones usage has levelled off.
- Trimethoprim shows summer peaks and a marginal downward trend in usage.
- Flucloxacillin shows a marginal downward trend in usage in the last three years.
- Beta-lactamase sensitive penicillin (mainly phenoxymethylpenicillin) shows no significant change in usage across time, with marked peaks in the Jan-Mar quarter of each year.
Figure 22: PTHB trends in Antibacterial Usage

Figure 22 shows the trends in quarterly data for usage the most commonly prescribed antibacterials:

- Amoxicillin shows marked winter peaks and a significant downward trend in usage.
- Macrolide usage shows winter peaks and a downward trend in usage.
- Doxycycline shows a marked upward trend, which levels out in the last quarter of 2018/19.
- Co-amoxiclav, cephalosporins and fluoroquinolones usage has levelled off.
- Trimethoprim shows summer peaks and a downward trend in usage.
- Flucloxacillin shows marked summer peaks and a downward trend in usage.
- Beta-lactamase sensitive penicillin (mainly phenoxyphenylpenicillin) shows a downward trend in usage, with decreasing peaks in the last quarter of each financial year (Jan-Mar).
Section 4.4: GP Cluster level antibacterial usage

Abertawe Bro Morgannwg UHB

Figure 23: ABMUHB Total Antibacterial Usage by GP Cluster

Figure 23 shows total antibacterial usage for the 64 GP Clusters present in Wales in 2018/19. The ABMUHB GP Clusters (orange bars) are presented in descending order of antibacterial usage with the other GP Clusters across Wales (grey bars). Three of the eleven ABMUHB GP clusters were in the top quintile of prescribing:

- Afan (second highest prescribing Cluster in Wales)
- Bridgend West Network (fifth highest prescribing Cluster in Wales)
- Bridgend North Network

Data showing the trends in total antibacterial usage (Figure 21) and the percentage point difference in prescribing of co-amoxiclav, cephalosporin, and fluoroquinolone for individual GP Cluster compared with the HB proportions (Figures 22-24) follow.

The percentage point data are presented in heat maps, using a colour gradation based on quintiles. Those in the lowest quintile are coloured white and those in the highest quintile are coloured dark blue. The scale goes from negative values (less than the HB proportion) to positive values (above the HB proportion).
Figure 24 shows trends in total antibacterial usage for ABMUHB GP Clusters from quarter Apr-Jun 2014 to quarter Jan-Mar 2019. The data shows:

- A decrease in the winter prescribing peaks in some GP Clusters suggesting a decrease in prescribing for self-limiting respiratory infections.
- A notable reduction in total prescribing for all GP Clusters across time.
- Afan, Bridgend North Network, and Bridgend West Network remain the highest prescribing GP Clusters across time.
- Bay Health remains the lowest prescribing GP Cluster across time.
Figure 25: Percentage point difference in co-amoxiclav usage by GP Cluster

Figure 26: Percentage point difference in cephalosporin usage by GP Cluster

Figure 27: Percentage point difference in fluoroquinolone usage by GP Cluster

Figures 25-27 show the percentage point difference in prescribing of co-amoxiclav, cephalosporin, and fluoroquinolone for individual GP Cluster in ABMUHB compared to the Health Board proportion for 2018/19.

- Bay Health and Llwchwr GP Clusters used a higher proportion of co-amoxiclav and fluoroquinolones than the other GP Clusters in the Health Board.
- Co-amoxiclav usage has reduced at Bay Health
- Co-amoxiclav usage has increased in the Penderi GP cluster.
- The historically high proportion of cephalosporin use in the Bridgend West Network GP cluster has reduced across time.
Figure 28: ABUHB Total Antibacterial Usage by GP Cluster

Figure 28 shows total antibacterial usage for the 64 GP Clusters present in Wales in 2018/19. The ABUHB GP Clusters (yellow bars) are presented in descending order of antibacterial usage with the other GP Clusters across Wales (grey bars).

Three of the twelve ABUHB GP clusters were in the top quintile of prescribing:
- Torfaen North (eight highest prescribing Cluster in Wales)
- Blaenau Gwent West (ninth highest prescribing Cluster in Wales)
- Torfaen South

Data showing the trends in total antibacterial usage (Figure 29) and the percentage point difference in prescribing of co-amoxiclav, cephalosporin, and fluoroquinolone for individual GP Cluster compared with the HB proportions (Figures 30-32) follow.

The percentage point data are presented in heat maps, using a colour gradation based on quintiles. Those in the lowest quintile are coloured white and those in the highest quintile are coloured dark blue. The scale goes from negative values (less than the HB proportion) to positive values (above the HB proportion).
Figure 29: ABUHB trends in Total Antibacterial Usage by GP Cluster

Figure 29 shows trends in total antibacterial usage for ABUHB GP Clusters from quarter Apr-Jun 2014 to quarter Jan-Mar 2019. The data shows:

- A decrease in the winter prescribing peaks in some GP Clusters suggesting a decrease in prescribing for self-limiting respiratory infections.
- A notable reduction in total prescribing for all GP Clusters across time.
- Torfaen North and Blaenau Gwent West remain the highest prescribing GP Clusters across time.
- Newport North, Newport West and Newport East are the lowest prescribing GP Clusters across time.
Figures 30-32 shows the percentage point difference in prescribing of co-amoxiclav, cephalosporin, and fluoroquinolone for individual GP Cluster in ABUHB compared to the Health Board proportion for 2018/19.

- Monmouthshire North GP Cluster historically uses higher proportions of all three drug/drug groups, but have made some reductions in cephalosporin use.
- Cephalosporin usage remain higher in the Caerphilly South Cluster.
- The historically higher proportion of cephalosporin use in the Torfaen North GP cluster has reduced across time.
**Figure 33: BCUHB Total Antibacterial Usage by GP Cluster**

*Figure 33* shows total antibacterial usage for the 64 GP Clusters present in Wales in 2018/19. The BCUHB GP Clusters (green bars) are presented in descending order of antibacterial usage with the other GP Clusters across Wales (grey bars).

None of the fourteen BCUHB GP clusters were in the top quintile of prescribing.

Data showing the trends in total antibacterial usage (*Figure 34*) and the percentage point difference in prescribing of co-amoxiclav, cephalosporin, and fluoroquinolone for individual GP Cluster compared with the HB proportions (*Figures 35-37*) follow.

The percentage point data are presented in heat maps, using a colour gradation based on quintiles. Those in the lowest quintile are coloured white and those in the highest quintile are coloured dark blue. The scale goes from negative values (less than the HB proportion) to positive values (above the HB proportion).
Figure 34 shows trends in total antibacterial usage for BCUHB GP Clusters from quarter Apr-Jun 2014 to quarter Jan-Mar 2019. The data shows:

- A decrease in the winter prescribing peaks in some GP Clusters suggesting a decrease in prescribing for self-limiting respiratory infections.
- A notable reduction in total prescribing for many GP Clusters across time.
- North Denbighshire and Dwyfor remain the highest prescribing GP Clusters across time.
- North West Flintshire is the lowest prescribing GP Cluster across time, and is the only GP Cluster in the health board within the bottom quintile.
Figures 35-37 shows the percentage point difference in prescribing of co-amoxiclav, cephalosporin, and fluoroquinolone for individual GP Cluster in BCUHB compared to the Health Board proportion for 2018/19.

- The proportion of co-amoxiclav use reduced in Central Wrexham and North & West Wrexham.
- Central & South Denbighshire and Central Wrexham use a higher proportion of cephalosporins.
- The historically higher proportion of fluoroquinolone use in North West Flintshire has reduced.
None of the nine CAVUHB GP clusters were in the top quintile of prescribing.

Data showing the trends in total antibacterial usage (Figure 39) and the percentage point difference in prescribing of co-amoxiclav, cephalosporin, and fluoroquinolone for individual GP Cluster compared with the HB proportions (Figures 40-42) follow.

The percentage point data are presented in heat maps, using a colour gradation based on quintiles. Those in the lowest quintile are coloured white and those in the highest quintile are coloured dark blue. The scale goes from negative values (less than the HB proportion) to positive values (above the HB proportion).
Figure 39: CAVUHB trends in Total Antibacterial Usage by GP Cluster

Figure 39 shows trends in total antibacterial usage for CAVUHB GP Clusters from quarter Apr-Jun 2014 to quarter Jan-Mar 2019. The data shows:

- A decrease in the winter prescribing peaks in some GP Clusters suggesting a decrease in prescribing for self-limiting respiratory infections.
- A notable reduction in total prescribing for many GP Clusters across time.
- Cardiff East remains the highest prescribing GP Cluster across time.
- Cardiff South East remains the lowest prescribing GP Cluster in CAVUHB and in Wales across time.
Figures 40-42 shows the percentage point difference in prescribing of co-amoxiclav, cephalosporin, and fluoroquinolone for individual GP Cluster in CAVUHB compared to the Health Board proportion for 2018/19.

- Co-amoxiclav use has reduced in Eastern Vale, but sporadically higher use is noted in Central Vale, Western Vale and Cardiff East.
- Eastern Vale generally uses a higher proportion of cephalosporins.
- Western Vale sporadically use higher proportions of fluoroquinones.
Figure 43: CTUHB Total Antibacterial Usage by GP Cluster

Figure 43 shows total antibacterial usage for the 64 GP Clusters present in Wales in 2018/19. The CTUHB GP Clusters (turquoise bars) are presented in descending order of antibacterial usage with the other GP Clusters across Wales (grey bars).

Five of the eight CTUHB GP clusters were in the top quintile of prescribing:
- South Rhondda (highest prescribing Cluster in Wales)
- North Rhondda (fourth highest prescribing Cluster in Wales)
- South Merthyr Tydfil (sixth highest prescribing Cluster in Wales)
- North Cynon (seventh highest prescribing Cluster in Wales)
- North Merthyr Tydfil

Data showing the trends in total antibacterial usage (Figure 44) and the percentage point difference in prescribing of co-amoxiclav, cephalosporin, and fluoroquinolone for individual GP Cluster compared with the HB proportions (Figures 45-47) follow.

The percentage point data are presented in heat maps, using a colour gradation based on quintiles. Those in the lowest quintile are coloured white and those in the highest quintile are coloured dark blue. The scale goes from negative values (less than the HB proportion) to positive values (above the HB proportion).
Figure 44 shows trends in total antibacterial usage for CTUHB GP Clusters from quarter Apr-Jun 2014 to quarter Jan-Mar 2019. The data shows:

- A decrease in the winter prescribing peaks in some GP Clusters suggesting a decrease in prescribing for self-limiting respiratory infections.
- A significant reduction in total antibacterial usage in South Taf Ely and North Taf Ely in 2018/19.
- South Rhondda and North Cynon are the highest prescribing GP Clusters across time.
- North Taff Ely remains the lowest prescribing GP Clusters across time.
Figures 45-47 show the percentage point difference in prescribing of co-amoxiclav, cephalosporin, and fluoroquinolone for individual GP Cluster in CTUHB compared to the Health Board proportion for 2018/19.

- North Merthyr Tydfil, North Rhondda and South Taf Ely generally uses a higher proportion of co-amoxiclav.
- South Merthyr Tydfil and South Taf Ely use higher proportion of cephalosporins.
- South Merthyr Tydfil sporadically use higher proportions of fluoroquinolone.
Figure 48: HDUHB Total Antibacterial Usage by GP Cluster

Figure 48 shows total antibacterial usage for the 64 GP Clusters present in Wales in 2018/19. The HDUHB GP Clusters (red bars) are presented in descending order of antibacterial usage with the other GP Clusters across Wales (grey bars).

Two of the seven HDUHB GP clusters were in the top quintile of prescribing:
- Llanelli (third highest prescribing Cluster in Wales)

Data showing the trends in total antibacterial usage (Figure 49) and the percentage point difference in prescribing of co-amoxiclav, cephalosporin, and fluoroquinolone for individual GP Cluster compared with the HB proportions (Figures 50-52) follow.

The percentage point data are presented in heat maps, using a colour gradation based on quintiles. Those in the lowest quintile are coloured white and those in the highest quintile are coloured dark blue. The scale goes from negative values (less than the HB proportion) to positive values (above the HB proportion).
Figure 49 shows trends in total antibacterial usage for HDUHB GP Clusters from quarter Apr-Jun 2014 to quarter Jan-Mar 2019. The data shows:

- A decrease in the winter prescribing peaks in some GP Clusters suggesting a decrease in prescribing for self-limiting respiratory infections.
- A reduction in total prescribing for most GP Clusters across time.
- Llanelli remains the highest prescribing GP Cluster across time.
- North Ceredigion remains the lowest prescribing GP Cluster across time.
Figures 50-52 shows the percentage point difference in prescribing of co-amoxiclav, cephalosporin, and fluoroquinolone for individual GP Cluster in HDUHB compared to the Health Board proportion for 2018/19.

- North Ceredigion, South Pembrokeshire and Taf/Tywi generally uses a higher proportion of co-amoxiclav.
- South Pembrokeshire use higher proportion of cephalosporins.
- A number of Clusters sporadically use higher proportions of fluoroquinolone, most notably North Pembrokeshire.
Figure 53: PTHB Total Antibacterial Usage by GP Cluster

Figure 53 shows total antibacterial usage for the 64 GP Clusters present in Wales in 2018/19. The PTHB GP Clusters (purple bars) are presented in descending order of antibacterial usage with the other GP Clusters across Wales (grey bars).

None of the three PTHB GP clusters was in the top quintile of prescribing; in fact, two of the three Clusters appeared in the bottom (lowest) quintile of prescribing.

Data showing the trends in total antibacterial usage (Figure 54) and the percentage point difference in prescribing of co-amoxiclav, cephalosporin, and fluoroquinolone for individual GP Cluster compared with the HB proportions (Figures 55-57) follow.

The percentage point data are presented in heat maps, using a colour gradation based on quintiles. Those in the lowest quintile are coloured white and those in the highest quintile are coloured dark blue. The scale goes from negative values (less than the HB proportion) to positive values (above the HB proportion).
Figure 54: PTHB trends in Total Antibacterial Usage by GP Cluster

Figure 54 shows trends in total antibacterial usage for PTHB GP Clusters from quarter Apr-Jun 2014 to quarter Jan-Mar 2019. The data shows:

- A decrease in the winter prescribing peaks in the GP Clusters suggesting a decrease in prescribing for self-limiting respiratory infections.
- There is a marked reduction in total prescribing in all GP Clusters across time.
- South Powys remains the highest prescribing GP Cluster across time.
- North Powys remains the lowest prescribing GP Cluster across time.
Figures 55-57 shows the percentage point difference in prescribing of co-amoxiclav, cephalosporin, and fluoroquinolone for individual GP Cluster in CTUHB compared to the Health Board proportion for 2018/19.

- South Powys generally uses a higher proportion of co-amoxiclav.
- The historically higher proportion of cephalosporin use in South Powys has reduced across time.
- The percentage point difference in fluoroquinolone use between is very small (-0.88 to 0.55), indicating there is little difference in fluoroquinolone use in PTHB. Although the use of colour graduated quintiles in this instance, makes North Powys appear significantly higher.
Section 5: Useful links

Welsh Health Circulars
https://gov.wales/topics/health/nhswales/circulars/?lang=en

National Prescribing Indicators 2017–2018 - Analysis of Prescribing Data to March 2018

Antimicrobial Resistance in Wales 2008-2017
http://www.wales.nhs.uk/sitesplus/888/page/94136

Review on Antimicrobial Resistance May 2016
https://amr-review.org/

UK Antimicrobial Resistance Strategy 2013 – 18


UK 20-year vision for antimicrobial resistance
https://www.gov.uk/government/publications/uk-20-year-vision-for-antimicrobial-resistance

Antimicrobial resistance: UK launches 5-year action plan and 20-year vision