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Report on the Point Prevalence Survey of Antimicrobial Prescribing in Secondary Care in Wales November/December 2009

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Version: 1 Antimicrobial PPS - Wales	Page: 1 of 63	Welsh Antibacterial Resistance Programme: Surveillance Unit

EXECUTIVE SUMMARY

- ❖ The latest Point Prevalence Study of Antimicrobial Use in Secondary care in Wales was performed in November/December 2009.
 - 6460 patients were surveyed from 23 hospitals
- ❖ 29.5% of patients (30.7% in 2008) were receiving one or more antimicrobials at the time of the survey.
 - 14.7% patients had antimicrobials for a community-acquired infection
 - 10.0% patients had antimicrobials for a hospital-acquired infection (HAI)
 - 3.5% patients had antimicrobials for surgical prophylaxis
 - 2.5% patients had antimicrobials for medical prophylaxis
- ❖ 72 different antimicrobials were being used
 - The commonest agent was co-amoxiclav
 - The 10 most common agents accounted for 68.7% of use.
- ❖ 36.1% of patients on antimicrobials were receiving more than one agent
- ❖ The commonest indication for antimicrobials was community-acquired infection
 - Respiratory tract infection – 403 diagnoses (**42.5%**)
 - Skin, soft tissue, bone & joint infection – 165 diagnoses (**17.4%**)
 - Urinary tract infection – 150 diagnoses (**15.8%**)
 - Gastrointestinal infection – 122 diagnoses (**12.9%**)
- ❖ The most common hospital acquired infections were
 - Respiratory tract infection – 180 diagnoses (**27.9%**)
 - Skin, soft tissue, bone & joint infection – 146 diagnoses (**22.6%**)
 - Gastrointestinal infection – 135 diagnoses (**20.9%**)
 - Urinary tract infection – 122 diagnoses (**18.9%**)
- ❖ 107 antibacterials (12.2% of those given for HAI) were being given for the treatment of *C. difficile*-associated disease
- ❖ The commonest indications for surgical prophylaxis were
 - Skin, soft tissue, bone & joint infection – 113 antimicrobials (**40%**)
 - Gastrointestinal infection – 78 antimicrobials (**28%**)
- ❖ 52.2% antimicrobials received for medical prophylaxis were given to prevent respiratory tract infections
- ❖ The reason for an antimicrobial prescription was recorded in the patients' medical record on 83.5% of occasions.
- ❖ As a measure of duration of therapy, 18.2% of antimicrobials given for treatment of infection had already been given for more than 7 days at the time of survey.

INTRODUCTION

Issues in Antimicrobial Usage

While the use of antimicrobial agents has revolutionised our ability to treat infections, it is associated inevitably with the risk of development and spread of antimicrobial resistance leading to infections that are increasingly difficult to treat, and antimicrobial-associated adverse events, importantly *Clostridium difficile*-associated disease (CDAD).

It has been estimated that between 20-50% of antimicrobial use, both in the Community and in Hospitals, is “inappropriate”. This means that patients and society may be exposed to a significant unnecessary risk of resistant infections and CDAD. In addition there is a financial cost, not only in terms of unnecessary antimicrobial use, but also the additional cost of treating resistant infections and CDAD.

Surveillance of Antimicrobial Usage in Secondary Care

A key step in improvement of antimicrobial use is the surveillance and assessment of current antimicrobial usage. This can be achieved using a number of complementary methods:

- Gross surveillance of antimicrobial usage at the hospital, specialty or ward/unit level: This can provide comparative information regarding the choice and quantity of agents used, but does not address the indications or appropriateness of antimicrobial use. Data for hospitals across Wales can be accessed via the NPHS report at (<http://howis.wales.nhs.uk/sites3/page.cfm?orgld=457&pid=20791>).
- Point Prevalence Survey (PPS): In this type of survey, the prescription chart of every patient in a ward or hospital on a set day is checked to see if an antibiotic has been prescribed, and the reasons for the prescription are recorded. This local information about which antimicrobials are used and why can be used to target interventions.
- Local unit/ward audits: Audit can be used to explore in detail the indications, dose, duration etc. of antimicrobial prescriptions in order to identify areas for improvement.

Methodology

The PPS took place during the weeks 16th November - 14th December 2009, to mark European Antimicrobial Awareness day (18th November 2009). The PPS was based on a modification of the current European Surveillance of Antimicrobial Consumption (ESAC) PPS format – see form APPENDIX A. The data was recorded locally by antimicrobial pharmacists and ward pharmacists. The data was collected in paper format; the completed forms were sent to the Public Health Wales where the data was transcribed, analysed and is presented here by the Antimicrobial Resistance Programme.

The current report provides a simple overview of data collected as part of the second All-Wales Point Prevalence Survey (PPS) of antimicrobial usage in secondary care. This report allows for comparison between units, although it should be noted that, ward coverage was variable between different hospitals. Thus comparisons should be made with caution.

HOSPITAL INFORMATION

Data for 23 hospitals is included in these analyses (Hospital Code):

- Bronglais Hospital (A)
- Princess of Wales Hospital (B)
- Royal Glamorgan Hospital (C)
- Royal Gwent Hospital (D)
- Morryston Hospital (E)
- University Hospital of Wales (F)
- Withybush General Hospital (G)
- Wrexham Maelor Hospital (H) & Deeside Community Hospital (H2)
- West Wales General Hospital (J)
- Ysbyty Gwynedd (K)
- Ysbyty Glan Clwyd (L)
- Nevill Hall Hospital (M)
- Prince Charles Hospital (N), St Tydfil's (N2) & Aberdare Hospital (N3)
- Llandough Hospital (P)
- Velindre Hospital (Q)
- Prince Philip Hospital (R)
- Singleton Hospital (S)
- Neath Port Talbot Hospital (T)
- Caerphilly Miners Hospital (U)
- West Wing (W)

Note: Due to small numbers, for some of the analyses the prescribing data for Deeside Community hospital has been combined with Wrexham Maelor (H*), and the data for Aberdare and St Tydfil's hospital have been combined with Prince Charles hospital (N*).

Ward Information

Patients from 335 wards were included in the PPS. The ward specialty, the number of patients surveyed on the ward, the number of patients prescribed antimicrobials, the number and proportion of patients prescribed antibacterials at or before 8:00 am on the day of the survey are shown in **Table 1 Appendix B**.

Speciality Information

- 1010 general medicine patients were prescribed antimicrobials (**28.7%**)
- 653 surgical patients were prescribed antimicrobials (**28.3%**)
- 117 ICU/SCBU patients were prescribed antimicrobials (**59.4%**)
- 76 Med/Surgical ward patients were prescribed antimicrobials (**31.4%**)
- 39 paediatric patients were prescribed antimicrobials (**29.8%**)
- 7 Surgical/ICU ward patients were prescribed antimicrobials (**70%**)
- 3 community hospital patients were prescribed antimicrobials (**16.7%**)
- None of patients surveyed from adult mental health were prescribed antimicrobials

PATIENT INFORMATION

- 6460 patients were surveyed
- 3514 of the patients were general medicine patients (**54.4%**)
- 2308 of the patients were surgical patients (**35.7%**)
- 242 of the patients were from mixed medical/surgical wards (**3.7%**)
- 208 of the patients were ICU/SCBU patients (**3.2%**)
- 131 of the patients were paediatric patients (**2.0%**)
- 29 of the patients were adult mental health (**0.4%**)
- 18 of the patients were from a community hospital ward (**0.3%**)
- 10 the patients were from a mixed surgical/ICU wards (**0.2%**)

Of the 6460 patients surveyed in the 2009 PPS, 1905 were prescribed systemic antimicrobial/s (**29.5%**).

- 1905 were prescribed systemic antimicrobials (including antibacterials, antifungals, antivirals & TB regimens)
- 1869 were prescribed regimens which included systemic antibacterials (including TB regimens)
- 65 were prescribed regimens which included systemic or topical antifungals
- 18 were prescribed topical antimicrobials/antiseptics only and are not included in these analyses
- 10 were prescribed antiviral therapy only and are not included in these analyses

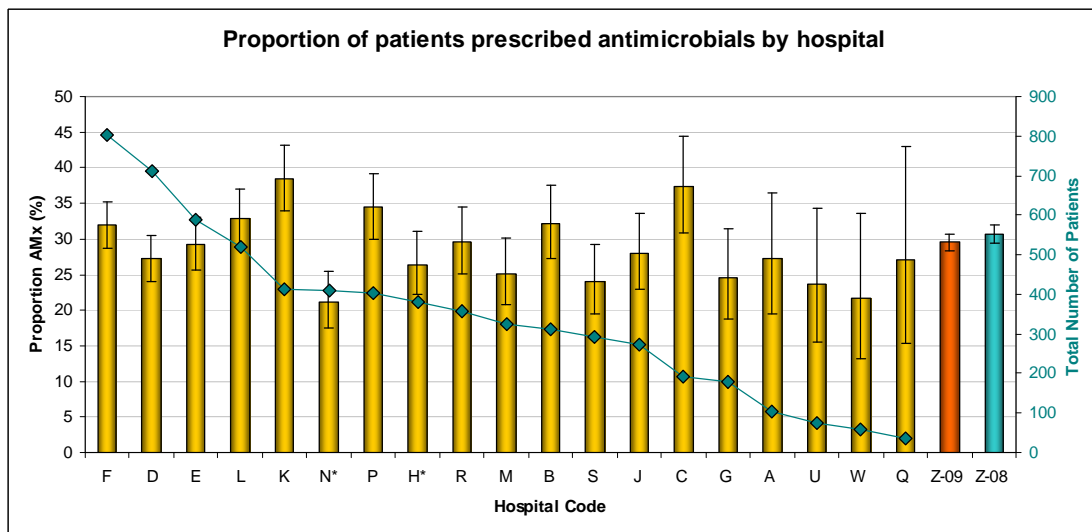


Figure 1: Proportion of patients prescribed antimicrobials and total number surveyed.

The total number of patients surveyed and the proportion of patients for whom antimicrobials were prescribed on the day of the PPS are shown in **Figure 1** along with the All-Wales figure for the 2008. **Note:** Because of the differences in case mix and because a number of the hospitals that took part in the 2009 PPS limited their survey to certain specialities e.g. general medicine and surgery, comparisons between hospitals cannot be made. However, the proportion of patients prescribed antimicrobials in the 2009 PPS (**29.5%**) is comparable to the proportion prescribed in the 2008 Wales PPS (**30.7%**).

The age group and gender of the 1905 patients prescribed antimicrobials is shown in **Figure 2**. Nearly half of the patients were 75 years or more in age (**44.5%**). In this PPS study group **47%** of the patients were male and **53%** were female. The age group and genders of patients at individual hospital level is shown in **Tables 2 & 3** in **Appendix B**.

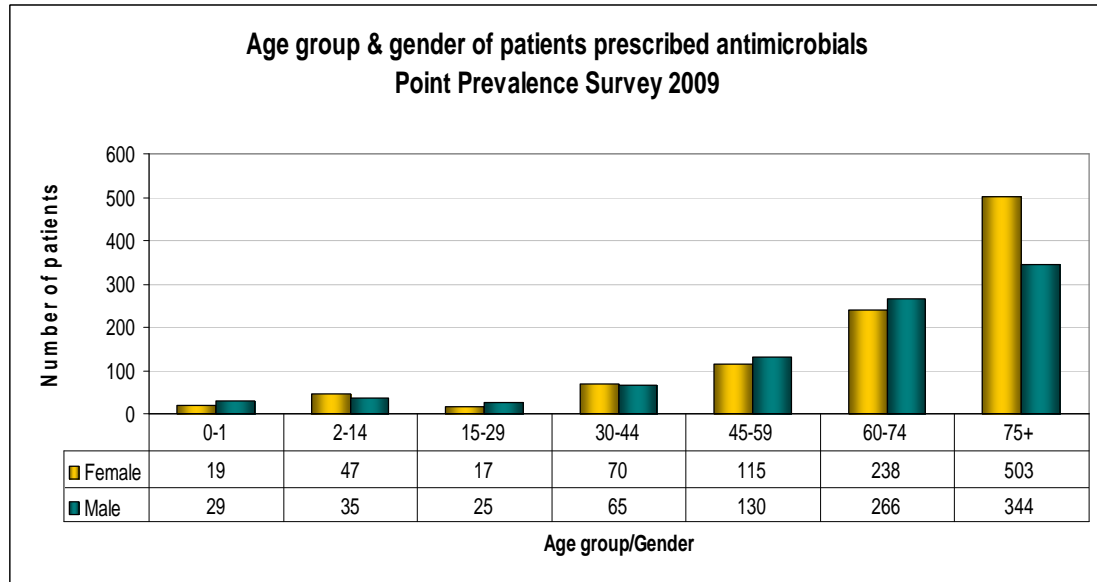


Figure 2: Age group & gender of patients prescribed antimicrobials (n = 1903). The age of one female patient was recorded as unknown, and the gender of a patient age 75+ was unknown (Overall total = 1905).

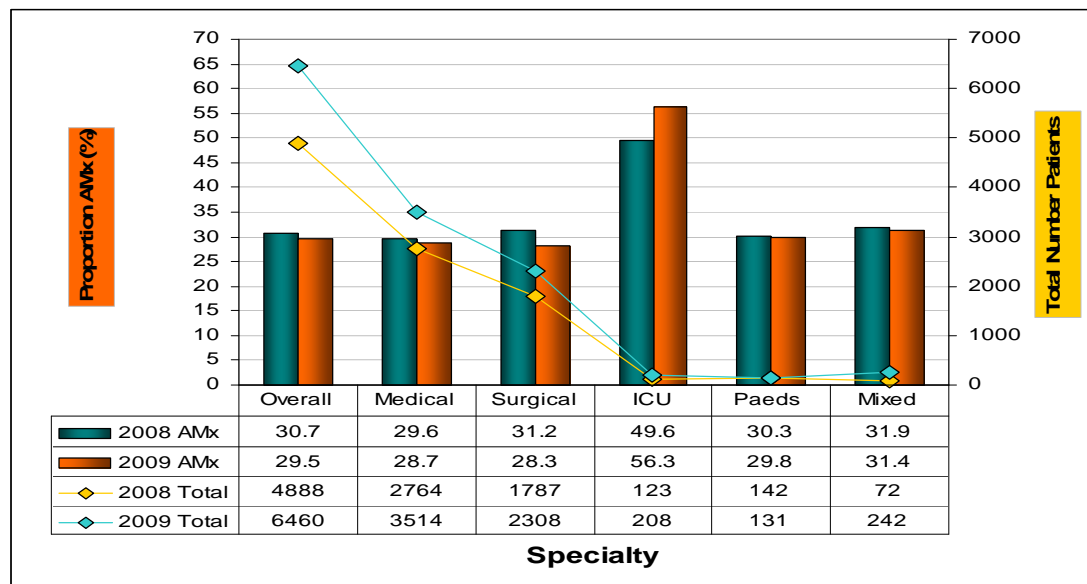


Figure 3: Antimicrobial prescribing by specialty (ICU includes SCBU).

Figure 3 shows the proportion of patients that were prescribed antimicrobials by specialty recorded in the 2008 & 2009 PPS. Unsurprisingly, the ICUs had the highest proportion with of patients prescribed antimicrobials; prescribing in this group increased from **49.6%** in 2008 to **56.3%** in 2009. The proportion of combined oral and parenteral antibacterial prescribing at specialty level for each individual hospital/hospital group is shown in **Table 4** in **Appendix B**.

CLINICAL INDICATIONS

The PPS included four main indications for antibacterial usage:

- **A** – Community acquired infection
- **B** – Hospital acquired infection
- **C** – Surgical prophylaxis
- **D** – Medical prophylaxis

Of the 6460 patients surveyed antibacterial agents were prescribed for the clinical indications as shown in **Figure 4**. The indications for prescribing at individual hospital level are shown in **Table 5** in **Appendix B**.

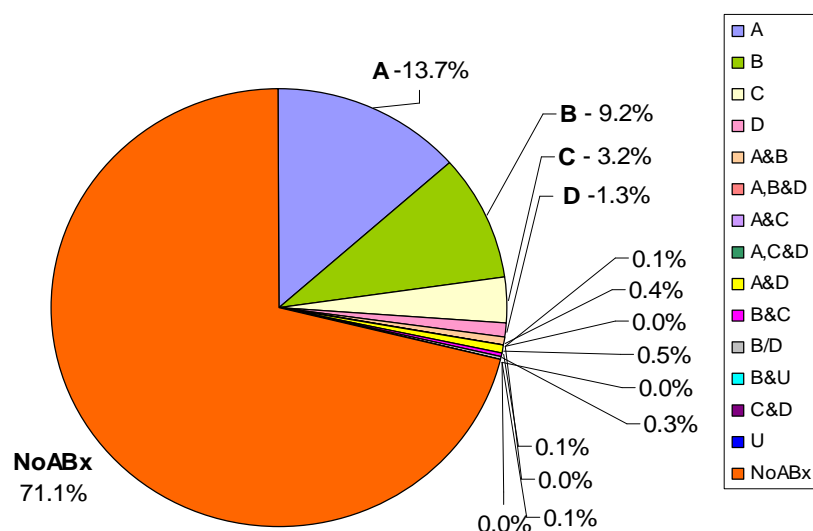


Figure 4: Clinical indication for antibacterial prescribing in patients (n = 6460)

- 883 patients were prescribed a regimen that included antibacterials for a community acquired infection only (**13.7%**)
- 594 patients were prescribed a regimen that included antibacterials for a hospital acquired infection only (**9.2%**)
- 206 patients were prescribed antibacterials for surgical prophylaxis only (**3.2%**)
- 83 patients were prescribed antibacterials for medical prophylaxis only (**1.3%**)
- 26 patients were prescribed a regimen that included antibacterials for community acquired infection and a hospital acquired infection (**0.4%**)
- 1 patient was prescribed a regimen that included antibacterials for community acquired infection, a hospital acquired infection and medical prophylaxis (**<0.1%**)
- 7 patients were prescribed a regimen that included antibacterials for community acquired infection and surgical prophylaxis (**0.1%**)
- 2 patients were prescribed antibacterials for community acquired infection, surgical prophylaxis and medical prophylaxis (**<0.1%**)
- 34 patients were prescribed antibacterials for community acquired infection and medical prophylaxis (**0.5%**)
- 5 patients were prescribed antibacterials for hospital acquired infection and surgical prophylaxis (**0.1%**)
- 18 patients were prescribed antibacterials for hospital acquired infection and medical prophylaxis (**0.3%**)
- 1 patient was prescribed antibacterials for a hospital acquired infection and an unknown indication (**<0.1%**)
- 6 patients were prescribed antibacterials for surgical prophylaxis and medical prophylaxis (**0.1%**)
- 3 patients were prescribed antibacterials for an unknown indication (**<0.1%**)
- 4591 patients were not prescribed antibacterials (**71.1% - NoABx**)

Indication for antimicrobial prescribing at drug level

The indications recorded for the 2820 antimicrobial prescriptions in the 1905 patients are shown in **Figure 5** (includes antiviral, antifungal & TB agents).

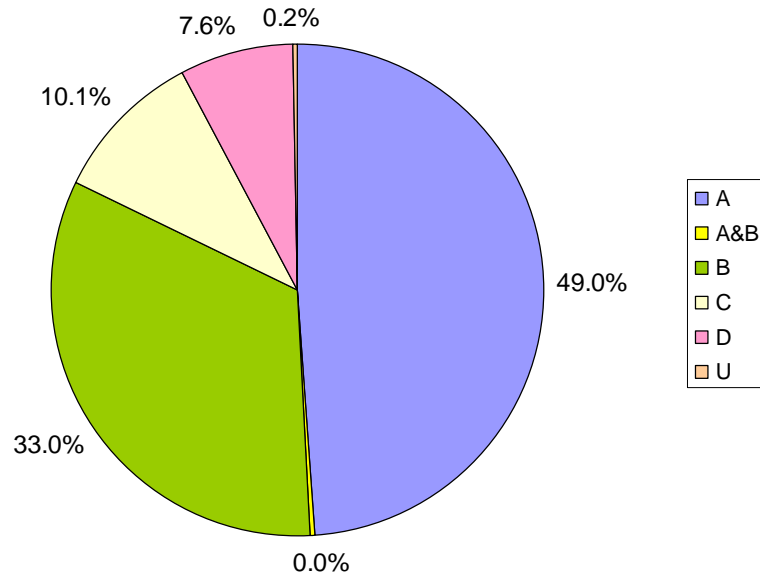


Figure 5: Antimicrobial prescribing by indication (n = 2820)

Figure 6 below shows the clinical indications for prescribing recorded in the 2009 PPS compared to the 2008 PPS: There was no significant change in the proportion of antimicrobials prescribed for community or hospital acquired infections or medical prophylaxis. The only statistically significant difference was a decrease in the proportion of antimicrobials prescribed for surgical prophylaxis (**10.1%** [95% CI, 9.1-11.3%] in the 2009 PPS compared to **12.8%** [11.5, 14.3] in 2008).

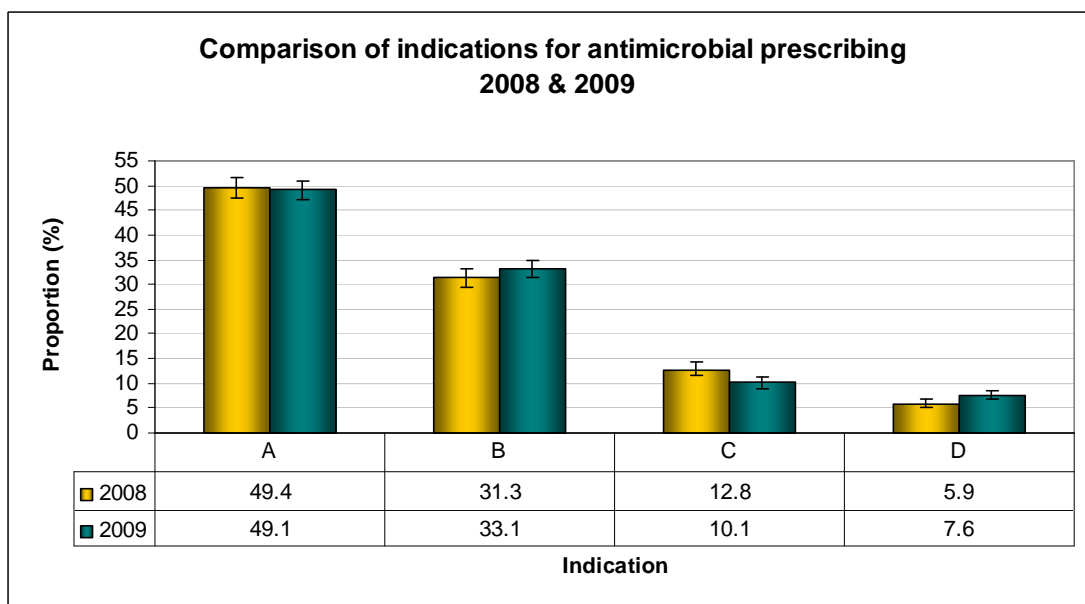


Figure 6: Antimicrobial prescribing by indication 2008 & 2009 PPS

The indication for each of the antibacterials prescribed for the patients in all of the hospitals is shown in **Table 6** in **Appendix B**. Unsurprisingly the hospital with the highest number of antimicrobials prescribed on the day of the PPS was **UHW** (425 antimicrobials were prescribed for 256 patients). The indications for the antimicrobials were: 147 (**34.5%**) for community acquired infections, 167 (**39.2%**) for hospital acquired infections, 27 (**6.4%**) surgical prophylaxis and 84 (**19.8%**) medical prophylaxis.

Reason for prescription recorded in patient notes

The proportion of instances where the reason for an antimicrobial prescription was recorded in the patient notes is shown in **Table 1**. Overall, the reason for a prescription was recorded in **83.5%** of cases; the reason for the prescription was less likely to be recorded in the notes when the antimicrobial was being prescribed as prophylaxis (**69.2%** - both surgical & medical prophylaxis). The figures for individual hospitals are shown in **Table 7** in **Appendix B**.

Table 1: Reason for prescription recorded in the notes

Indication	No	Yes	Unknown	Total	% Yes 2009	% Yes 2008
A	150	1229	4	1383	88.9%	88.4%
B	114	815	3	932	87.4%	89.1%
C	125	161		286	69.2%	61.5%
D	66	148		214	69.2%	72.7%
Unknown	2	1	2	5	40.0%	0%
All indications	457	2354	9	2820	83.5%	83.9%

For the indications A-D the median proportion of 'reason recorded in notes' in the Wales 2009 PPS was **82%** (IQR 78%-87%) similar to the median rate published for the Wales 2008 PPS of **81%** (IQR 70%-89%)

Duration of therapy

In the 2009 PPS the auditors were asked to record the duration of therapy i.e. the number of days that antimicrobials prescribed had been consumed up to and including the day of the PPS.

- For the treatment of infections (Indications A & B1-B5) the number of antibacterials consumed for more than 7 days on the day of the PPS was 402 out of 2213 prescriptions (**18.2%**).
- For all indications (Indications A, B1-B5, C1-C3 and D) the number of antibacterials consumed >7 days was 536 out of 2700 prescriptions (**19.9%**).
- If prescribing for *C. difficile* (Indication B3) alone was analysed the proportion of antibacterials consumed for >10 days was **19.6%**.

DIAGNOSIS GROUPS

The PPS included ten diagnosis groups based on anatomical site:

- Central nervous system (**CNS**)
- Eye (**EYE**)
- Ear, nose, throat, mouth or larynx (**ENT**)
- Respiratory tract (**RESP**)
- Cardiovascular system (**CVS**)
- Gastrointestinal tract including liver and biliary tree (**GI**)
- Skin, soft tissue, bone and joint (**SSTBJ**)
- Urinary tract (**UTI**)
- Genitourinary tract (**GUOB**)
- No clear anatomical site (**Not Defined**)

Note: The code **MIX** has been added in instances where an antimicrobial has been prescribed for more than one diagnosis group e.g. RESP & UTI.

ANTIMICROBIAL INFORMATION

72 different antimicrobials (excluding topical antimicrobials/antiseptics) were prescribed as treatment/prophylaxis in this patient group (see **Table 2** below); comprising 2769 issues to 1905 patients:

Table 2: Antimicrobials included in PPS group

Antimicrobial	ATC Code	No. of Scripts	Antimicrobial	ATC Code	No. of Scripts
Co-amoxiclav	J01CR02	356	Itraconazole	J02AC02	6
Metronidazole	J01XD01	315	Amphotericin	J02AA01	5
Cefuroxime	J01DC02	208	Amikacin	J01GB06	4
Clarithromycin	J01FA09	170	Ethambutol	J04AK02	4
Ciprofloxacin	J01MA02	169	Voriconazole	J02AC03	4
Flucloxacillin	J01CF05	160	Cefaclor	J01DC04	3
Amoxicillin	J01CA04	147	Minocycline	J01AA08	3
Trimethoprim	J01EA01	139	Valganciclovir	J05AB14	3
Piperacillin/Tazobactam	J01CR05	133	Abacavir	J05AF06	2
Vancomycin	J01XA01	106	Caspofungin	J02AX04	2
Meropenem	J01DH02	79	Daptomycin	J01XX09	2
Gentamicin	J01GB03	76	Isoniazid	J04AC01	2
Cefotaxime	J01DD01	67	Moxifloxacin	J01MA14	2
Doxycycline	J01AA02	57	Pyrazinamide	J04AK01	2
Benzylpenicillin	J01CE01	54	Rifinah	J04AM02	2
Teicoplanin	J01X02	44	Streptomycin	J01GA01	2
Cefalexin	J01DB01	42	Atripla	J05AR06	1
Aciclovir	J05AB01	33	Cefixime	J01DD08	1
Fluconazole	J02AC01	32	Chloramphenicol	J01BA01	1
Penicillin V	J01CE02	31	Dapsone	J04BA02	1
Rifampicin	J04AB02	28	Ertapenem	J01DH03	1
Erythromycin	J01FA01	27	Lamivudine	J05AF05	1
Co-trimoxazole	J01EE01	25	Lymecycline	J01AA04	1
Fusidic acid	J01XC01	24	Maraviroc	J05AX09	1
Imipenem/Cilastatin	J01DH51	21	Nevirapine	J05AG01	1
Azithromycin	J01FA10	18	Ofloxacin	J01MA01	1
Ceftriaxone	J01DD04	18	Pivmecillinam	J01CA08	1
Colistin	J01XB01	17	Posaconazole	J02AC04	1
Nitrofurantoin	J01XE01	17	Ribavirin	J05AB04	1
Ceftazidime	J01DD02	16	Rifater	J04AM05	1
Cefradine	J01DB09	15	Rifaximin	A07AA11	1
Clindamycin	J01FF01	14	Tenofovir	J05AF07	1
Tobramycin	J01GB01	14	Tetracycline	J01AA07	1
Linezolid	J01XX08	11	Ticarcillin	J01CR03	1
Oseltamivir	J05AH02	10	Tigecycline	J01AA12	1
Levofloxacin	J01MA12	9	Valaciclovir	J05AB11	1
Total numbers of antimicrobials prescribed					2769

The 10 most commonly prescribed antimicrobials were all antibacterials.

Table 3 shows that the proportion of prescribing of the top 10 antimicrobials for Wales decreased from **70.4%** recorded in the 2008 PPS to **68.7%** in 2009; data for individual hospital prescribing of the Top 10 antimicrobials is shown in **Table 8** in **Appendix B** and ranges from **58.7%** to **88.9%**.

Table 3: Comparison of top 10 antimicrobials for 2008 & 2009 PPS

Antimicrobial	Rank 2009	Proportion Scripts	Antimicrobial	Rank 2008	Proportion Scripts
Co-amoxiclav	1	12.9	Co-amoxiclav	1	12.8%
Metronidazole	2	11.4	Metronidazole	2	12.5%
Cefuroxime	3	7.5	Cefuroxime	3	8.6%
Clarithromycin	4	6.1	Ciprofloxacin	4	8.0%
Ciprofloxacin	5	6.1	Clarithromycin	5	7.2%
Flucloxacillin	6	5.8	Flucloxacillin	6	5.3%
Amoxicillin	7	5.3	Amoxicillin	7	5.2%
Trimethoprim	8	5.0	Trimethoprim	8	4.2%
Piperacillin/Tazobactam	9	4.8	Gentamicin	9	3.3%
Vancomycin	10	3.8	Vancomycin	10	3.3%
Top Ten 2009		68.7%	Top Ten 2008		70.4%

In 2009, co-amoxiclav remained the most commonly prescribed antimicrobial accounting for **12.9%** across Wales. Piperacillin/Tazobactam moved into the Top 10 replacing gentamicin as the ninth most prescribed antimicrobial. Gentamicin prescribing decreased from **3.3-2.7%** and Piperacillin/Tazobactam increased from **3.1-4.8%**.

Table 4 shows prescribing of the top ten antimicrobials categorised by route of administration. Parenteral cefuroxime was the most commonly prescribed antimicrobial accounting for **7.4%** of all prescriptions.

Table 4: Top ten antimicrobials for 2009 PPS by route of administration

Antimicrobial	Route Oral or Parenteral	Rank 2009	Proportion Scripts
Cefuroxime	Parenteral	1	7.4%
Co-amoxiclav	Oral	2	7.0%
Metronidazole	Parenteral	3	6.4%
Co-amoxiclav	Parenteral	4	5.9%
Ciprofloxacin	Oral	5	5.5%
Metronidazole	Oral	6	5.0%
Trimethoprim	Oral	7	4.9%
Piperacillin/Tazobactam	Parenteral	8	4.8%
Clarithromycin	Oral	9	4.8%
Amoxicillin	Oral	10	4.4%
Top Ten 2009			55.9%

Top ten antibacterials by route of administration:

1. **Cefuroxime (parenteral)**: prescribing comprised 205 prescriptions for 20 different diagnoses (see **Figure 7**). Treatment/prophylaxis for skin soft tissue bone & joint infections accounted for **42.9%** of prescriptions; gastrointestinal **25.9%** and respiratory **22.7%**

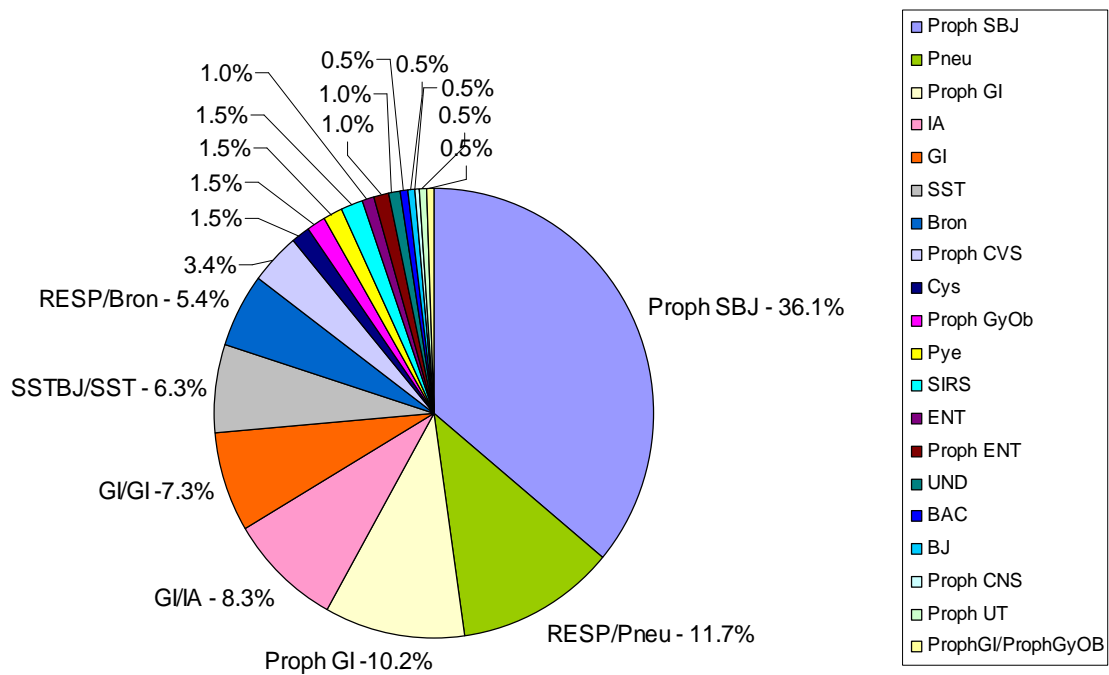


Figure 7: Diagnoses for parenteral cefuroxime prescribing

2. **Co-amoxiclav (oral):** prescribing comprised 97 prescriptions for 21 different diagnoses. Respiratory tract infections accounted for **50.8%** of prescriptions.
3. **Metronidazole (parenteral):** prescribing comprised 177 prescriptions for 21 different diagnoses. Treatment/prophylaxis for GI infections accounted for nearly **50%** of parenteral metronidazole prescribing.
4. **Co-amoxiclav (parenteral):** prescribing comprised 164 prescriptions for 23 different diagnoses. Respiratory tract infections accounted for **43.3%** of prescriptions.
5. **Ciprofloxacin (oral):** prescribing comprised 151 prescriptions for 17 different diagnoses. Treatment/prophylaxis for urinary tract infections accounted for **35.8%** of oral ciprofloxacin prescribing; **25.8%** prescribed for respiratory tract infections & **19.8%** for gastrointestinal infections.
6. **Metronidazole (oral):** prescribing comprised 138 prescriptions for 15 different diagnoses. Treatment/prophylaxis for GI infections accounted for **71%** of oral metronidazole prescribing.
7. **Trimethoprim (oral):** prescribing comprised 135 prescriptions for 6 different diagnoses. Treatment/prophylaxis for urinary tract infections accounted for **95.6%** of oral trimethoprim prescribing.
8. **Piperacillin/Tazobactam (parenteral):** prescribing comprised 133 prescriptions for 16 different diagnoses. Respiratory tract infections accounted for **51.1%** of prescriptions, BAC/SIRS & UND **23.3%**.
9. **Clarithromycin (oral):** prescribing comprised 132 prescriptions for 10 different diagnoses. Respiratory tract infections accounted for **90.2%** of oral clarithromycin prescribing.
10. **Amoxicillin (oral):** prescribing comprised 122 prescriptions for 13 different diagnoses. Respiratory tract infections accounted for **74.6%** of oral amoxicillin prescribing.

Figure 8 shows the number of different antimicrobials and antibacterials prescribed at individual hospital level (excluding topical agents). **Note:** For some hospitals only antibacterial agents were recorded; it is not clear if other antimicrobial agents were also prescribed but omitted from the survey.

- The number of antimicrobials ranged from **49** (UHW) to **3** (St Tydfil's)
- The number of antibacterials ranged from **36** (UHW) to **3**(St Tydfil's)

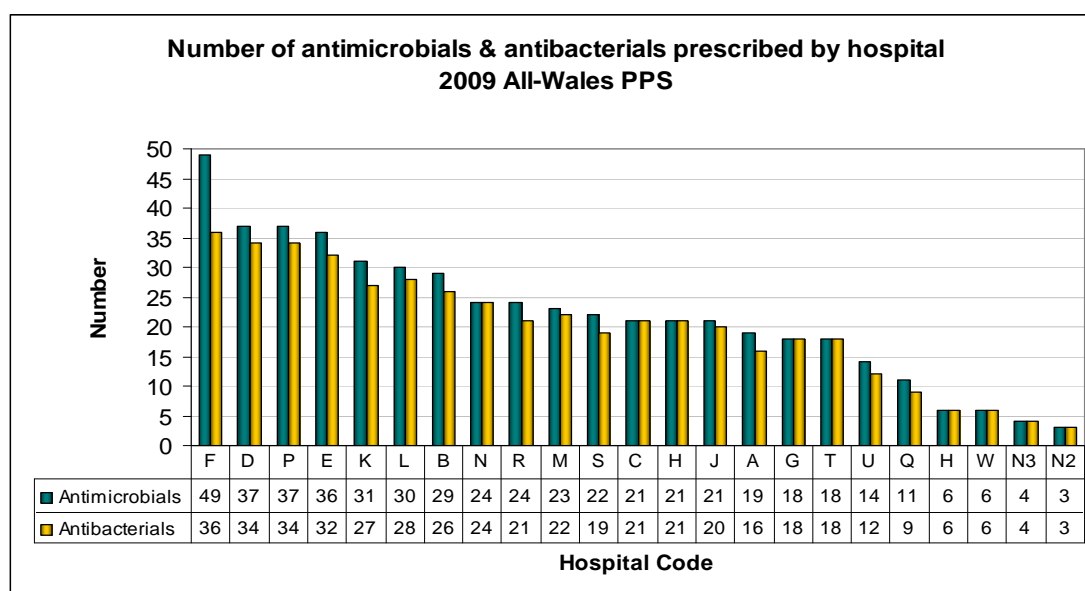


Figure 8: Number of antimicrobials/antibacterials by hospital

Antibacterial Combinations

674 of the 1869 patients (**36.1%**) were prescribed more than one antibacterial; similar to 2008 (**38%**). There were **232** different combinations of antibacterials prescribed in this PPS patient group; the most common combinations were:

- Cefuroxime plus metronidazole (prescribed for 72 patients)
- Co-amoxiclav plus clarithromycin (prescribed for 45 patients)
- Benzylpenicillin plus flucloxacillin (prescribed for 31 patients)
- Co-amoxiclav plus metronidazole (prescribed for 24 patients)

Figure 9 shows the proportion of antibacterials prescribed by indication (**A-D**) at patient level. Excluding the patients with more than one clinical indication, monotherapy was prescribed in **62.4%** of patients with community acquired infections (55.3% in 2008 PPS), compared to **68.2%** of patients with hospital acquired infections (67.4% - 2008 PPS), **77.2 %** surgical prophylaxis (62.1% - 2008 PPS) and **83.1%** for medical prophylaxis (64.5% - 2008 PPS). The figures for individual hospitals are shown in **Table 9** in **Appendix B**.

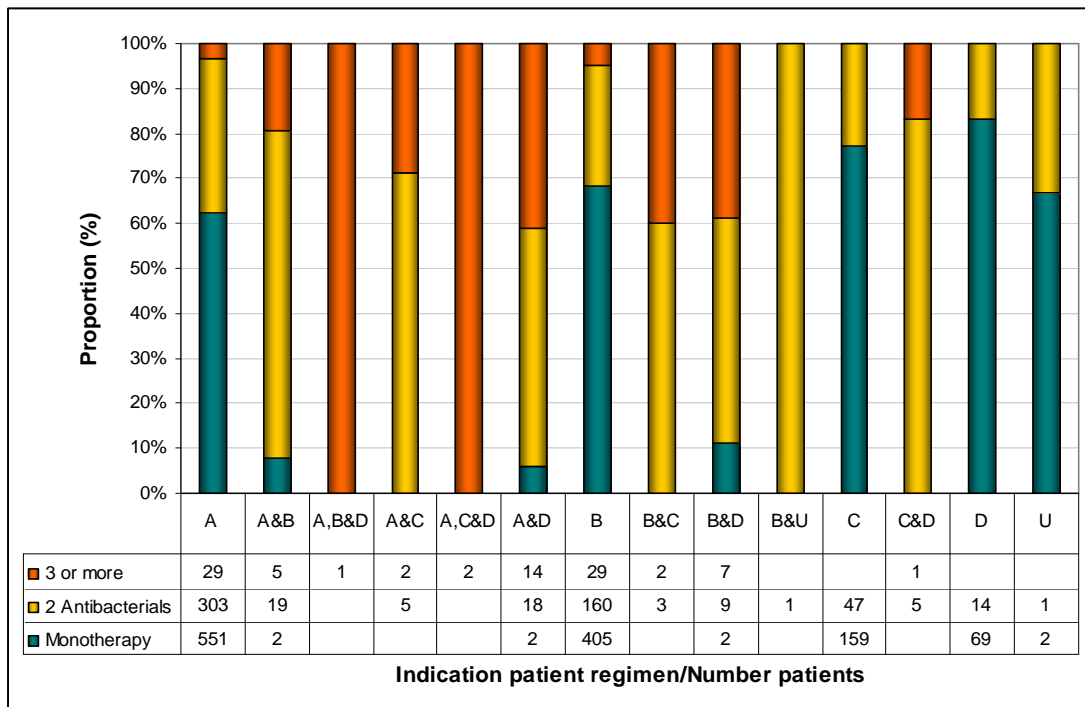


Figure 9: Prescriptions for antibacterial usage by indication – patient level

Excluding patients with more than one clinical indication, **50 patients** were prescribed 3 antibacterials or more (see **Figure 10**). Of these, 16 patients were prescribed triple-therapy for the treatment of respiratory tract infections and 16 for skin and soft tissue, bone & joint infections.

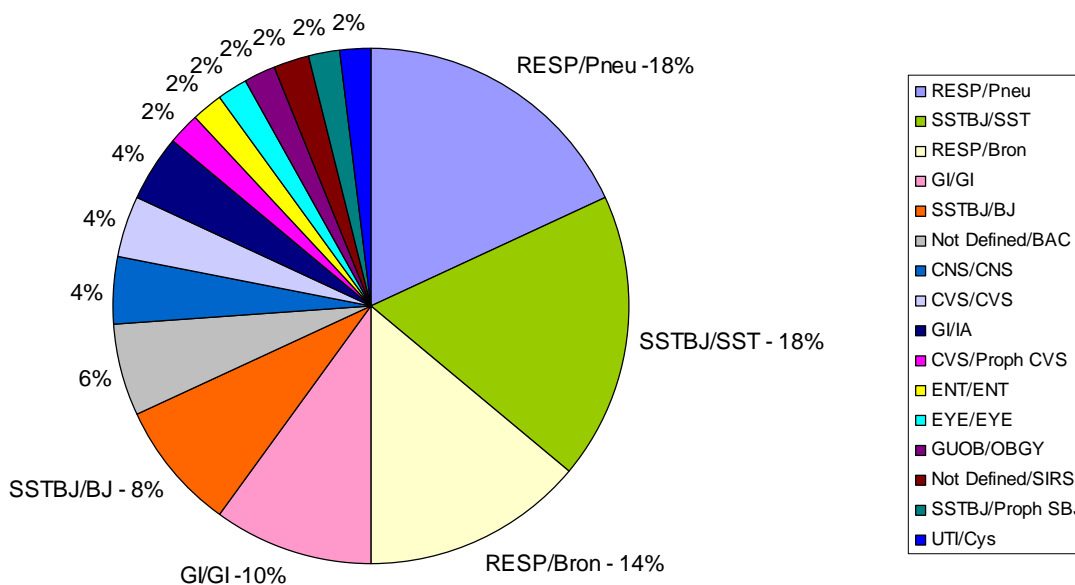


Figure 10: Multi-antibacterial (3 or more) regimens by diagnosis code

COMMUNITY ACQUIRED INFECTIONS (INDICATION A)

Community acquired infections (CAI) were the most common indication requiring an antimicrobial prescription.

- 949 of the 6460 patients surveyed were prescribed antibacterials for CAI (14.7%)
- Of the 1905 patients in the survey that were prescribed antibacterials, 949 (49.9%) were indicated for CAI (Indication A).
- 1385 **antimicrobials** were prescribed for CAI
- 1349 **antibacterials** were prescribed for CAI

Figure 11 shows that the number of antibacterials prescribed by diagnosis group for each hospital/hospital group. 572 of the 1349 (42.4%) antibacterials that were prescribed for indication A were for respiratory tract infections; this figure is comparable to the 44.3% recorded in the 2008 PPS.

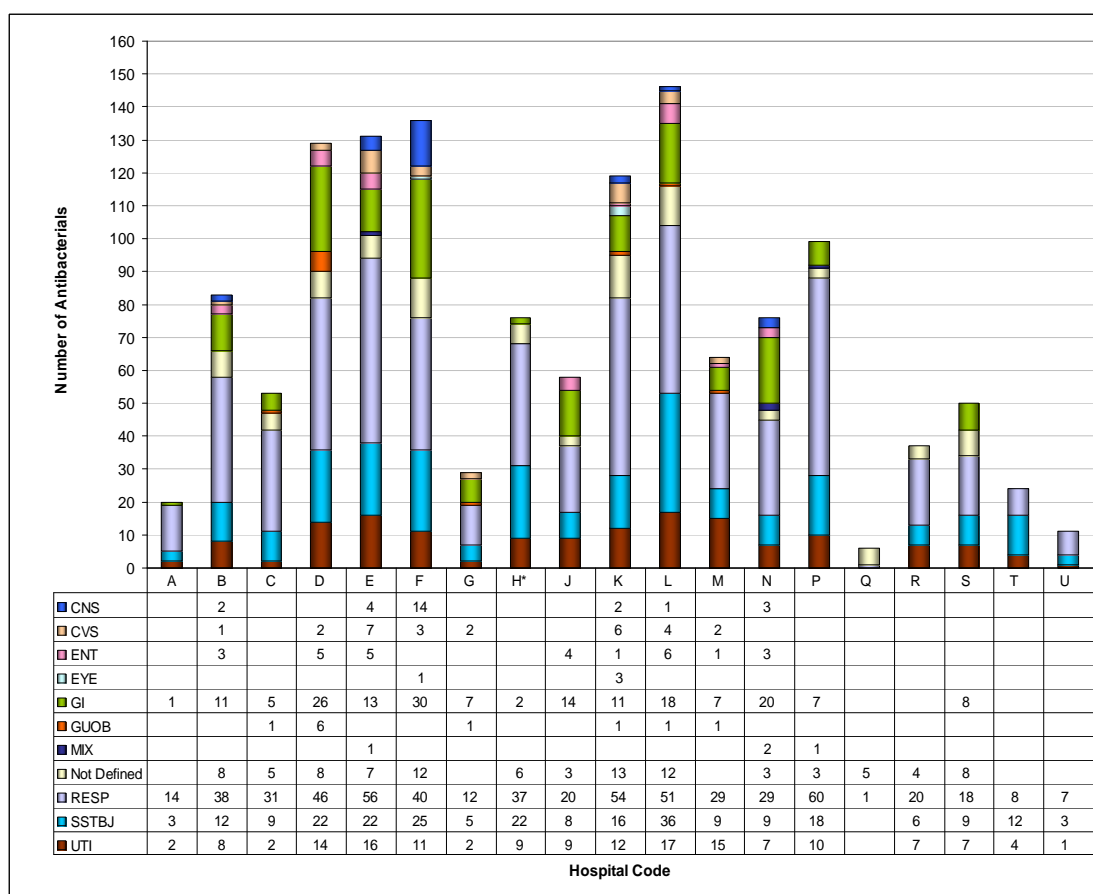


Figure 11: Antibacterials prescribed for indication A by diagnosis group

Figure 12 shows the proportion of antibacterials prescribed by diagnosis group for each hospital/hospital group with for indication A, with generally the highest proportion of antibacterials overall being prescribed for respiratory tract infections (RESP).

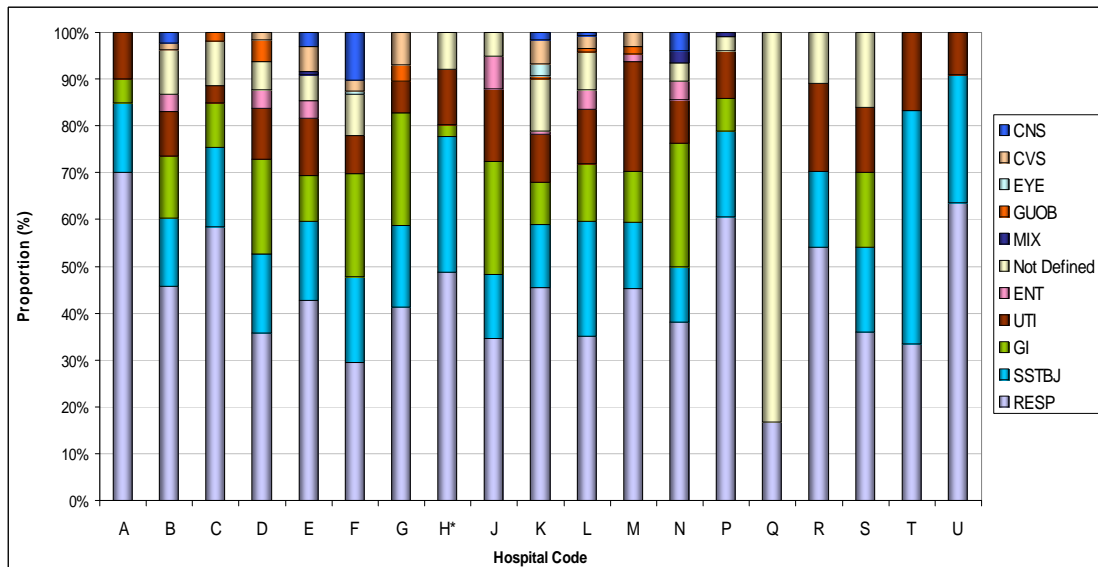


Figure 12: Proportion of antibacterials prescribed by diagnosis group

The most common community acquired infections were (n = 949):

- RTI – 403 diagnoses (**42.5%** compared with **44.2%** in 2008)
- SSTBJ – 165 diagnoses (**17.4%** compared with **13.7%** in 2008)
- UTI – 150 diagnoses (**15.8%** compared with **16.9%** in 2008)
- GI – 122 diagnoses (**12.9%** compared with **11.5%** in 2008)

Table 5 shows the numbers of patients prescribed antibacterials for CAI, the diagnosis group and the number of antibacterials prescribed per patient (the data set excludes patients with multi-diagnoses). The table shows that most UTIs were treated with monotherapy where as other infections were more likely to have combination therapy in varying proportions dependent on site.

Table 5: Numbers of patients prescribed antibacterials for community acquired infections (**A**) by diagnosis group.

Diagnosis Code	Monotherapy	2 Antibacterials	3 or More	Total
CNS	10 (63%)	5 (31%)	1 (6%)	16
CVS	5 (36%)	8 (57%)	1 (7%)	14
ENT	6 (38%)	9 (56%)	1 (6%)	16
EYE			1 (100%)	1
GI	52 (49%)	53 (50%)	1 (1%)	106
GUOB	6 (75%)	1 (12.5%)	1 (12.5%)	8
Not Defined	35 (59%)	23 (39%)	1 (2%)	59
RESP	224 (61%)	132 (36%)	11 (3%)	367
SSTBJ	74 (50%)	67 (45%)	7 (5%)	148
UTI	139 (99%)	2 (1%)		141
Total - 2009 PPS	551 (62.9%)	300 (34.2%)	25 (2.9%)	876
Total - 2008 PPS	398 (56.4%)	271 (38.4%)	37 (5.2%)	706

Note: The proportion of patients prescribed monotherapy for CAI increased from **56.4%** in the 2008 PPS to **62.9%** in 2009.

Community Acquired RTI

The antibacterials prescribed across Wales for the treatment of community acquired respiratory tract infections (CA-RTI) are shown in **Figure 13**.

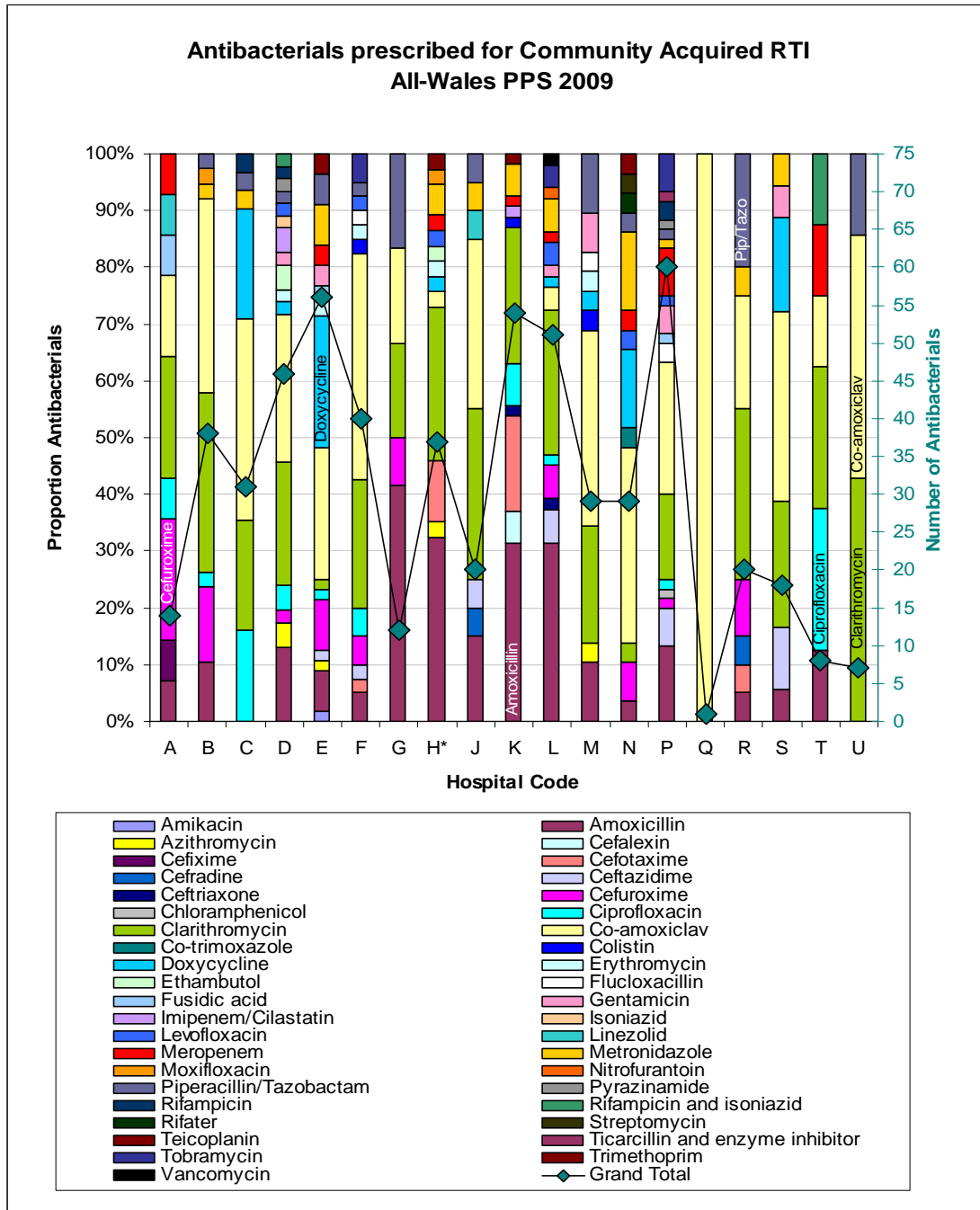


Figure 13: Antibacterials prescribed for CA- RTI

Across Wales the most commonly prescribed antibacterials for CA-RTI were co-amoxiclav **22%** of all prescriptions (**23%** in 2008), clarithromycin **20%** (**26%** in 2008) and amoxicillin **15%** (**14%** in 2008). However there was a lot of regional variation in the choice of agent with ciprofloxacin (hospitals C & T) and cefuroxime (hospitals A & B) prescribing in some hospitals and a notable regional increase in doxycycline prescribing (hospitals C, E, N & S).

Excluding patients with multi-diagnoses, the pattern of prescribing varied widely with **75 different regimens** including monotherapies and combinations being prescribed. For some hospitals e.g. Llandough (P) the wide variation in regimens can be explained by the inclusion of cystic fibrosis (CF) patients in this PPS; this is also likely to be the cases for other major hospitals.

The BTS guidelines for treatment of community acquired pneumonia are:

- Low severity:** Preferred – amoxicillin
Alternative – doxycycline or clarithromycin
- Moderate severity:** Preferred – amoxicillin
Alternative – doxycycline or clarithromycin
- High severity:** Preferred – co-amoxiclav plus clarithromycin
Alternative – benzylpenicillin plus levofloxacin or ciprofloxacin OR
Cefuroxime, or cefotaxime or ceftriaxone plus clarithromycin

Of the 132 patients with a diagnosis of community acquired pneumonia (CAP) prescribing varied widely with **44 different regimens** including monotherapies and combinations being prescribed: **16.7%** of CAP patients were prescribed co-amoxiclav plus clarithromycin, whilst another **54.4%** were prescribed antibacterials in the guidelines, however, some of the antibacterials were prescribed in combinations that were not recommended in the BTS guidance e.g. amoxicillin plus ciprofloxacin, and cefuroxime plus doxycycline.

Dosing regimens for Community Acquired RTI

Co-amoxiclav: Figure 14 shows that **55%** of patients diagnosed with a community acquired respiratory tract infection (CA-RTI) that were prescribed co-amoxiclav were prescribed 0.625g oral co-amoxiclav TDS, and **35%** were prescribed 1.2g parenteral co-amoxiclav TDS.

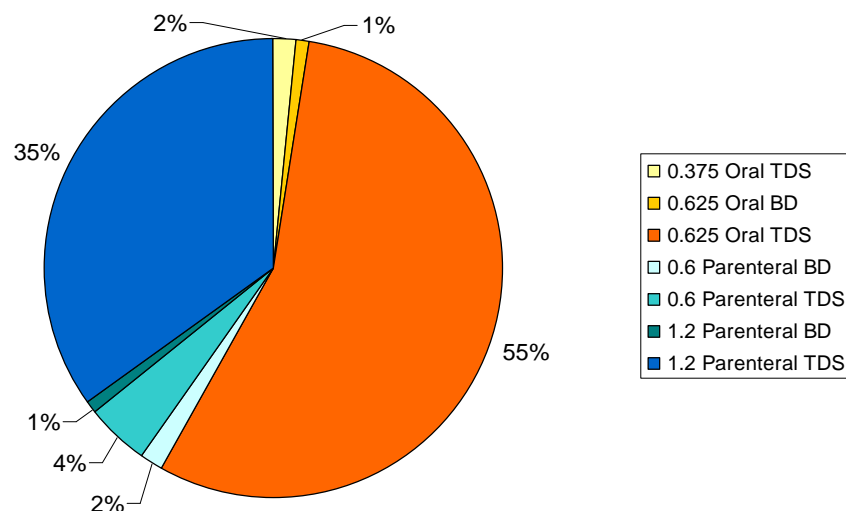


Figure 14: Prescribed dosage for treatment of CA-RTI with co-amoxiclav

Amoxicillin: Figure 15 shows that **72%** of patients with CA-RTI that were prescribed amoxicillin were prescribed 0.5g oral amoxicillin TDS & **13%** were prescribed 1g oral amoxicillin TDS.

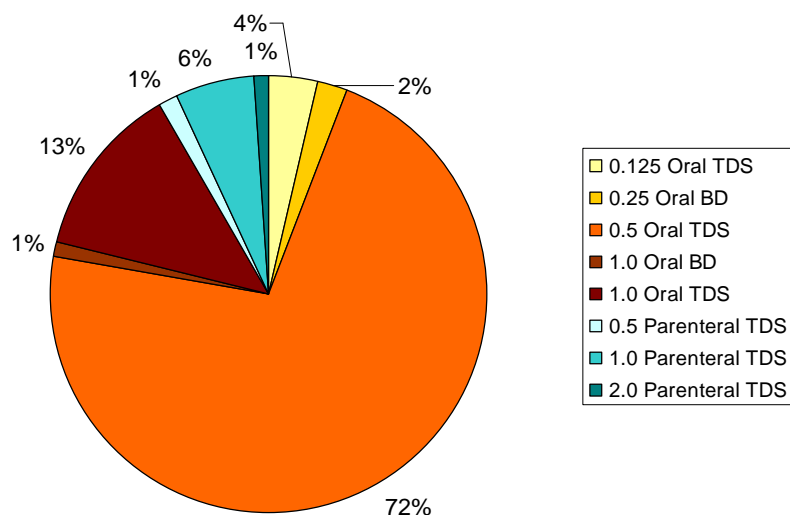


Figure 15: Prescribed dosage for treatment of CA-RTI with amoxicillin

Clarithromycin: Figure 16 shows that **75%** of patients with CA-RTI that were prescribed clarithromycin were prescribed 0.5g oral clarithromycin BD and **16%** were 0.5g parenteral clarithromycin BD.

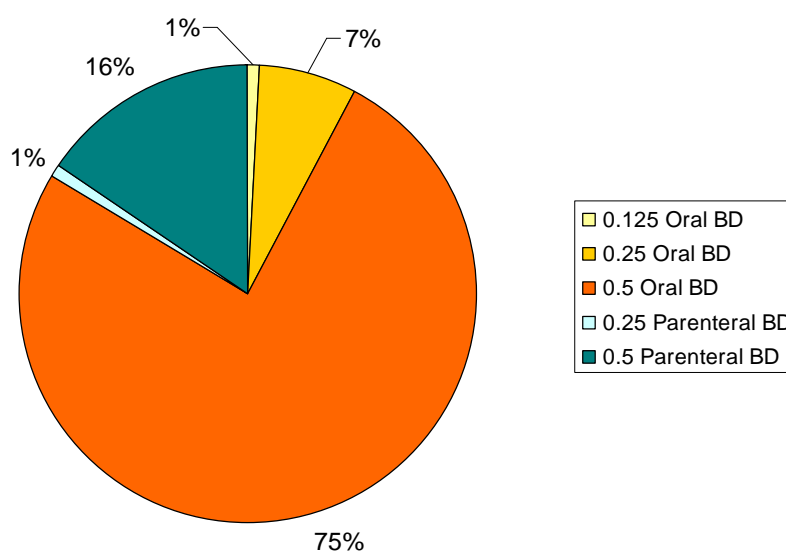


Figure 16: Prescribed dosage for treatment of CA-RTI with clarithromycin

The dosage for co-amoxiclav, amoxicillin, clarithromycin, and doxycycline prescribed for the treatment of CA-RTI at individual hospital level are shown in **Table 10** in **Appendix B**.

Community Acquired UTI

The antibacterials prescribed for the treatment of community acquired urinary tract infections (CA-UTI) are shown in **Figure 17**. The most commonly prescribed antibacterials were trimethoprim (**37%**), ciprofloxacin (**18%**) and co-amoxiclav (**17%**), comprising **72%** of prescriptions for CA-UTI in total.

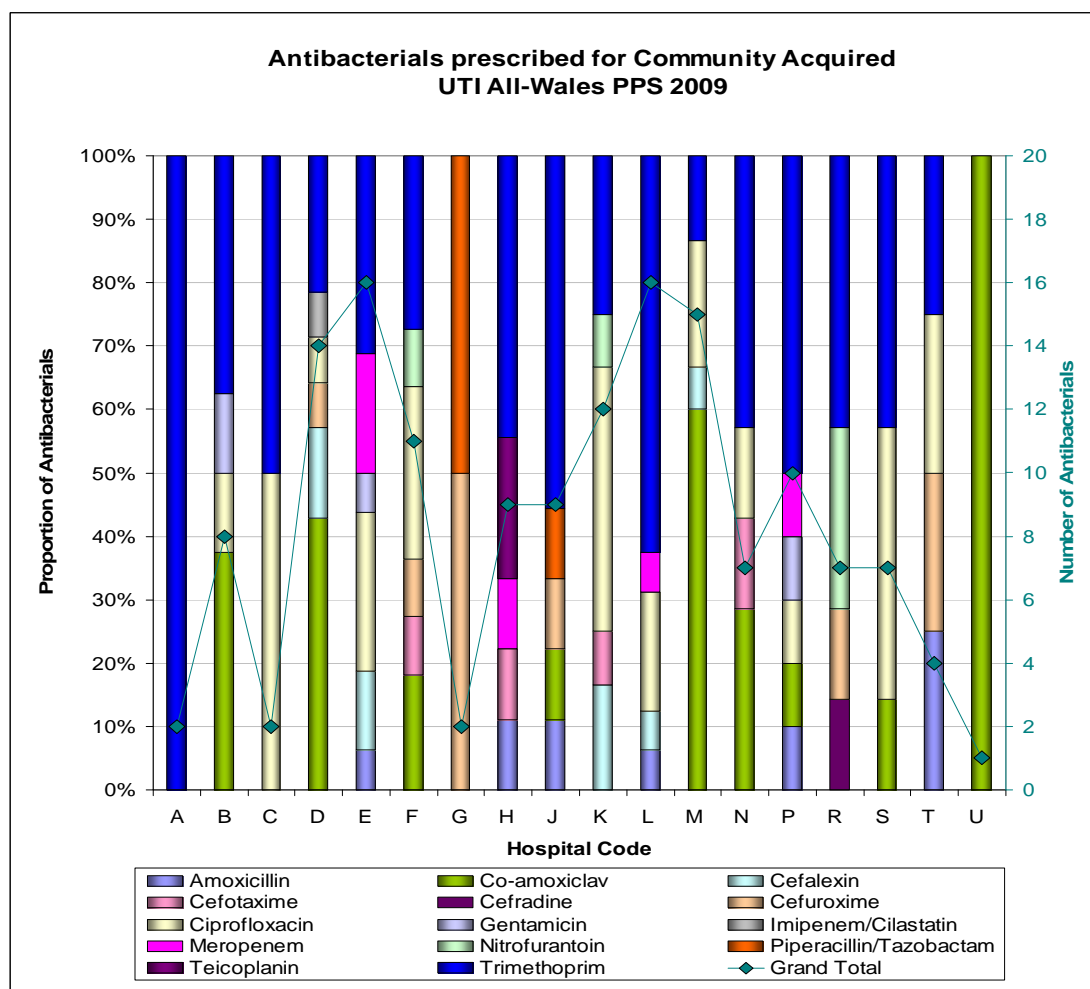


Figure 17: Antibacterials prescribed for CA-UTI

Excluding patients with multi-diagnoses, the pattern of prescribing varied between hospitals with **16 different regimens** including monotherapies and combinations being prescribed; the most common were:

- Trimethoprim monotherapy (53 prescriptions)
- Ciprofloxacin monotherapy (26 prescriptions)
- Co-amoxiclav monotherapy (26 prescriptions)

There was little variation in the dosing regimens for the 3 most commonly prescribed antibacterials:

- Trimethoprim **96%** of prescriptions were for 0.2g oral BD
- Ciprofloxacin **78%** 0.5g oral BD & **11%** were 0.75g oral BD
- Co-amoxiclav **46%** 0.625g oral TDS & **31%** were 1.2g parenteral TDS

Community Acquired SSTBJ Infections

The antibacterials prescribed for the treatment of community acquired skin, soft tissue, bone & joint infections (CA-SSTBJ) are shown in **Figure 18**. Flucloxacillin (**29%**), benzylpenicillin (**13%**), co-amoxiclav (**12%**) and metronidazole (**9%**) were the most commonly prescribed antibacterials, comprising **63%** of prescriptions for community acquired SSTBJ infection in total.

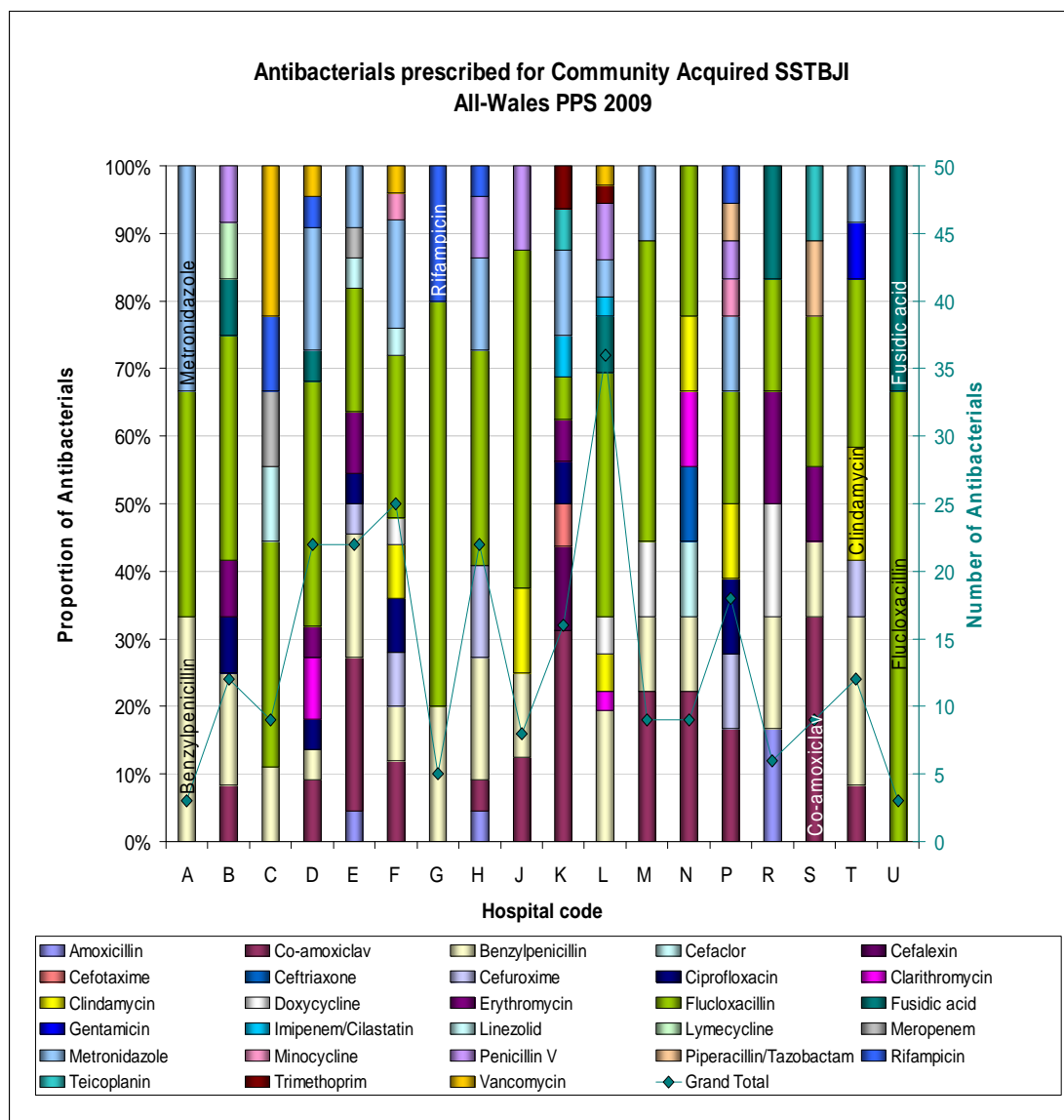


Figure 18: Antibacterials prescribed for CA-SSTBJ

Excluding patients with multi-diagnoses, the pattern of prescribing varied between hospitals with **54 different regimens** including monotherapies and combinations being prescribed. The most common regimens were:

- Benzylpenicillin plus flucloxacillin (24 prescriptions)
- Co-amoxiclav monotherapy (17 prescriptions)
- Flucloxacillin monotherapy (16 prescriptions)

Dosing regimens for Community Acquired SSTBJI

Flucloxacillin: Figure 19 shows the variation in prescribing: **50%** of patients diagnosed with CA-SSTBJI that were prescribed flucloxacillin were prescribed 1.0g parenteral flucloxacillin QDS and **25%** were prescribed 0.5g oral flucloxacillin QDS.

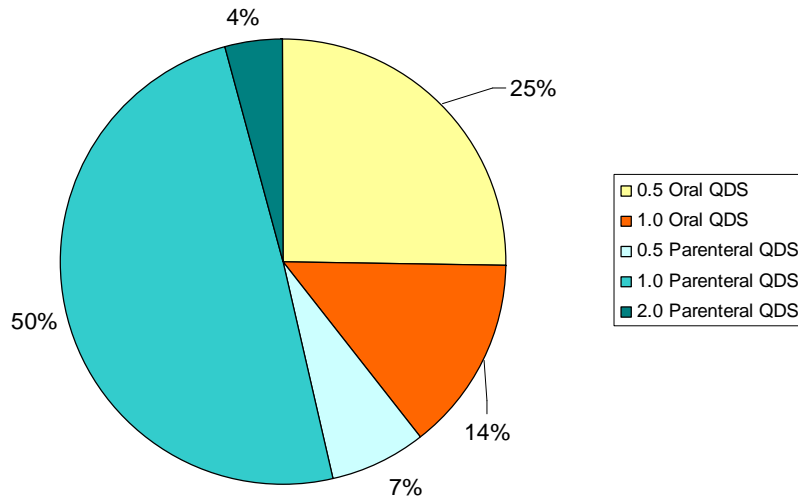


Figure 19: Prescribed dosage for treatment of CA-SSTBJI with flucloxacillin

Co-amoxiclav: Figure 20 shows the variation in prescribing: **49%** of patients diagnosed with a CA-SSTBJI that were prescribed co-amoxiclav were prescribed 0.625g oral co-amoxiclav TDS and **36%** were prescribed 1.2g parenteral co-amoxiclav TDS.

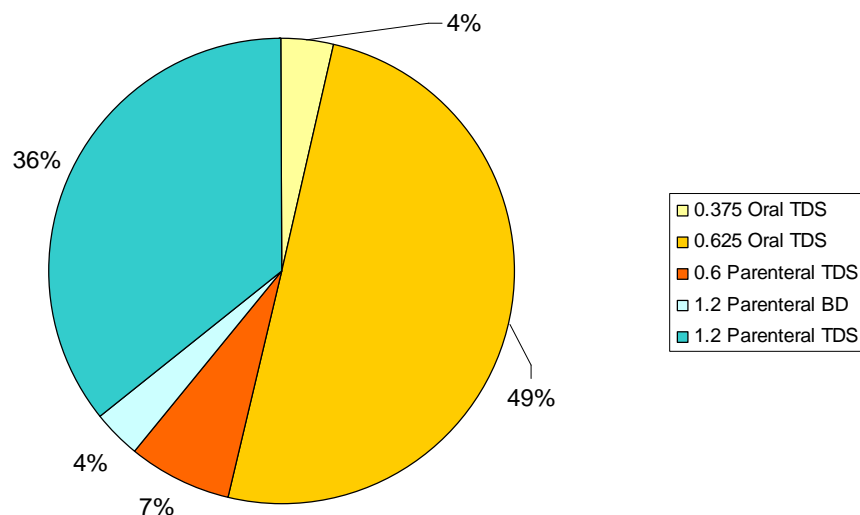


Figure 20: Prescribed dosage for treatment of CA-SSTBJI with co-amoxiclav

HOSPITAL ACQUIRED INFECTIONS (INDICATION B)

Hospital acquired infections (HAI) were the second most common indication requiring an antimicrobial prescription.

- 645 of the 6460 patients surveyed were prescribed antibacterials for HAI (10.0%)
- Of the 1905 patients in the survey that were prescribed antibacterials, 645 (33.8%) were indicated for HAI (**Indication B**).
- 920 **antimicrobials** were prescribed for HAI
- 876 **antibacterials** were prescribed for HAI

Figure 21 shows that the number of antibacterials prescribed by diagnosis group for each hospital. 236 of the 876 antibacterials prescribed in this group were for respiratory tract infections (RESP), 202 were for skin, soft tissue, bone & joint infections (SSTBJ) & 176 were for gastrointestinal infections (GI).

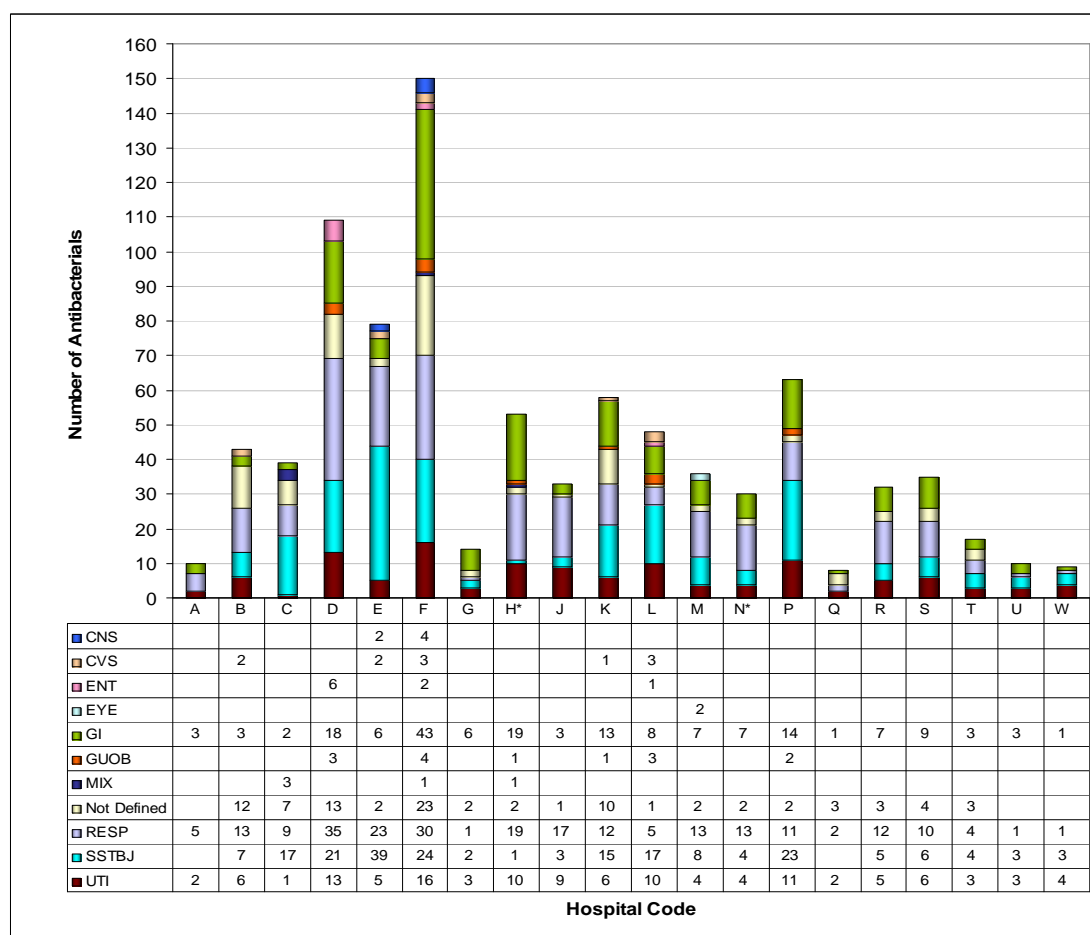


Figure 21: Antibacterials prescribed for indication B by diagnosis group

Figure 22 shows the proportion of antibacterials prescribed by diagnosis group for each hospital/hospital group with for indication B, with generally the highest proportion of antibacterials overall being prescribed for respiratory tract infections (**RESP**).

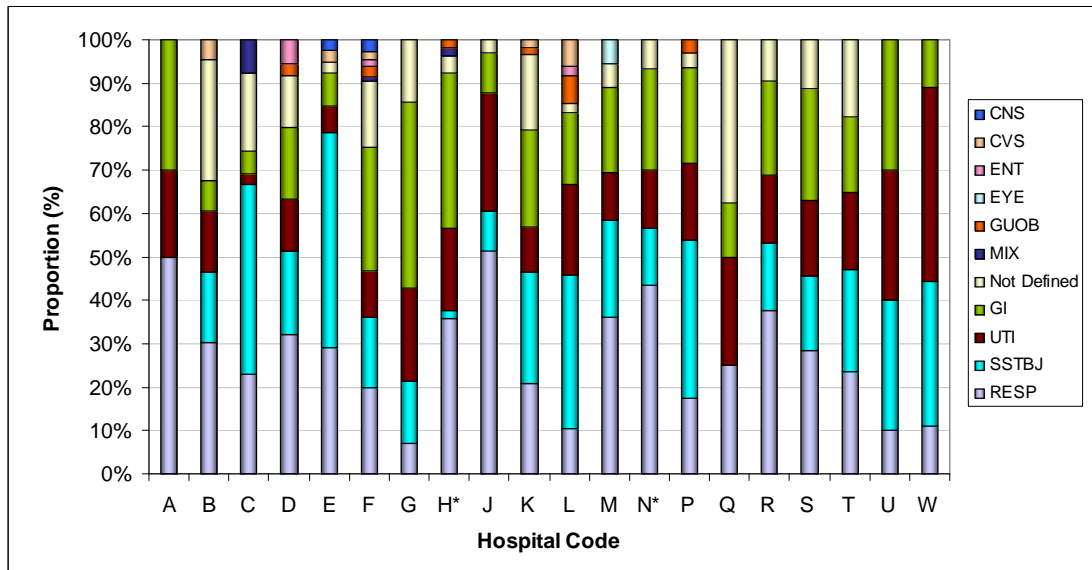


Figure 22: Proportion of antibacterials prescribed by diagnosis group

The most common hospital acquired infections were (n= 645):

- RTI – 180 diagnoses (**27.9%** compared with **25%** in 2008)
- SSTBJ – 146 diagnoses (**22.6%** compared with **22.3%** in 2008)
- GI – 135 diagnoses (**20.9%** compared with **18.2%** in 2008)
- UTI – 122 diagnoses (**18.9%** compared with **20.6%** in 2008)

Table 6 shows the numbers of patients prescribed antibacterials for hospital acquired infections, the diagnosis group and the number of antibacterials prescribed per patient (the data set excludes patients with multi-diagnoses). The table shows that most UTIs were treated with monotherapy where as other infections were more likely to have combination therapy in varying proportions dependent on site.

Table 6: Numbers of patients prescribed antibacterials for hospital acquired infections (**B**) by diagnosis group

Diagnosis Code	Monotherapy	2 Antibacterials	3 or More	Total
CNS		3 (100%)		3
CVS	2 (40%)	2 (40%)	1 (10%)	5
ENT	5 (71%)	2 (29%)		7
EYE		1 (100%)		1
GI	79 (72%)	24 (22%)	6 (6%)	109
GUOB	6 (60%)	4 (40%)		10
Not Defined	26 (53%)	19 (39%)	4 (8%)	49
RESP	100 (68%)	43 (29%)	4 (3%)	147
SSTBJ	81 (64%)	41 (32%)	5 (4%)	127
UTI	111 (98%)	2 (2%)		113
Total – 2009 PPS	410 (72%)	141 (25%)	20 (3%)	571
Total – 2008 PPS	326 (67%)	132 (26%)	26 (5%)	484

Note: The proportion of patients prescribed monotherapy for HAI increased from **67.3%** in the 2008 PPS to **71.8%** in 2009.

The PPS included five sub-indications within hospital acquired infection (**B**):

- **B1** – Post-operative infection
- **B2** – Other intervention related infections
- **B3** – *C. difficile* associated diarrhoea
- **B4** – Other hospital acquired infection
- **B5** – Infection present on admission from another hospital

The diagnosis groups & sub-indications within the hospital acquired infection group are shown in **Table 7**. Sub-indication **B4** was the most common in this PPS group accounting for **43%** of prescribing for hospital acquired infections.

Table 7: Diagnosis group by sub-indication

Diagnosis Group	B1	B2	B3	B4	B5
CNS	2	4			
CVS	2	1		5	3
ENT	6	1		2	
EYE				2	
GI	41	6	107	17	5
GUOB	14				
MIX	4			1	
Not Defined	10	18		61	3
RESP	31	29		164	12
SSTBJ	133	18		41	10
UTI	13	14		84	12
All diagnosis	256	91	107	377	45
All Diagnosis (%)	29.2%	10.4%	12.2%	43.0%	5.1%

- **B1** – **52%** of antibacterials prescribed for post-operative infection were for SSTBJ infections
- **B2** – Nearly one third of antibacterials prescribed for intervention related infections were for respiratory tract infections urinary (**32%**) showing a marked increase in the proportion recorded for 2008 of **12.9%**.
- **B3** – 107 antibacterials were prescribed for the treatment of *C. difficile*. **12.2%** of all antibacterials prescribed for HAI were prescribed for the treatment of *C. difficile*, an increase from the **8.6%** prescribed in 2008.
- **B4** – 164 of the 377 antibacterials prescribed for other HAI were for respiratory tract infections (**43.5%**) and 84 were for UTIs (**22.3%**).
- **B5** – Treatment for respiratory infections, urinary tract infections and SSTBJ infections accounted for **76%** of the antibacterials prescribed for 'infection present on admission from another hospital'.

Note: The antibacterials prescribed for hospital acquired infections are shown in **Table 11** in **Appendix B**. The most commonly prescribed antibacterials for this indication were:

- Metronidazole: 137 prescriptions - **15.6%** (**16.6%** in 2008)
- Co-amoxiclav: 95 prescriptions - **10.8%** (**11.6%** in 2008)
- Vancomycin: 83 prescriptions - **9.5%** (**7.1%** in 2008)
- Piperacillin/Tazobactam: 74 prescriptions - **8.4%** (**4.7%** in 2008)

The choice of antibacterials prescribed for HAI was large, especially for the following:

- **SSTBJ** infections 29 different antibacterials (27 in 2008 PPS)
- **RESP** infections 22 different antibacterials (20 in 2008 PPS)
- **Not Defined** infections 19 different antibacterials (18 in 2008 PPS)

The antibacterials prescribed for the sub-indications B1, B2, B3, B4 & B5 are shown in **Table 12** in **Appendix B**.

Sub-indication B3 (*Clostridium difficile* infection)

81 patients were prescribed antibacterial/antibacterials for the treatment of hospital acquired *C. difficile* infection. Excluding patients with multi-indications (n=73):

- 36 patients were prescribed metronidazole monotherapy (**49%**)
- 24 were prescribed vancomycin monotherapy (**33%**)
- 12 were prescribed metronidazole & vancomycin (**16%**)
- 1 was prescribed metronidazole and rifampicin (**1%**).

Of the 8 patients with multi-indications metronidazole was included in the regimen for 5 patients, vancomycin was included in the regimen for 2 patients and metronidazole plus vancomycin was included in the regimen for 1 patient. **Figure 23** shows the regimens prescribed for all 81 patients.

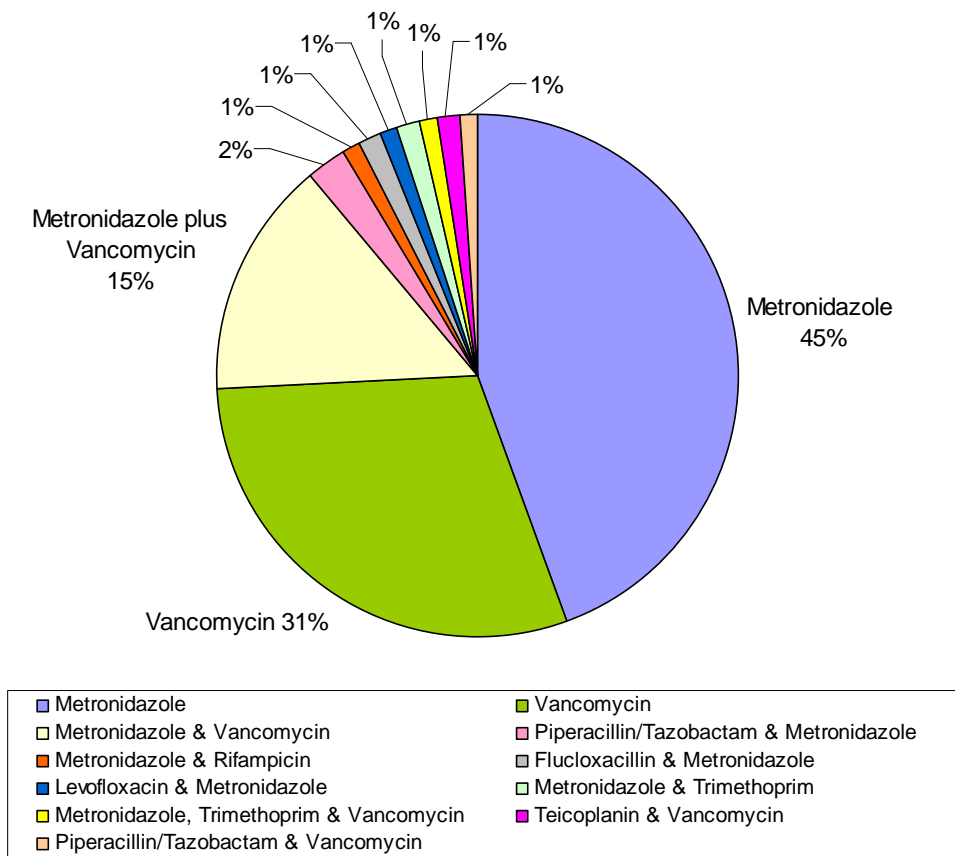


Figure 23: Antibacterial regimens for patients with *C. difficile*

Hospital Acquired RTI

The antibacterials prescribed for the treatment of hospital acquired respiratory tract infections (HA-RTI) are shown in **Figure 24**.

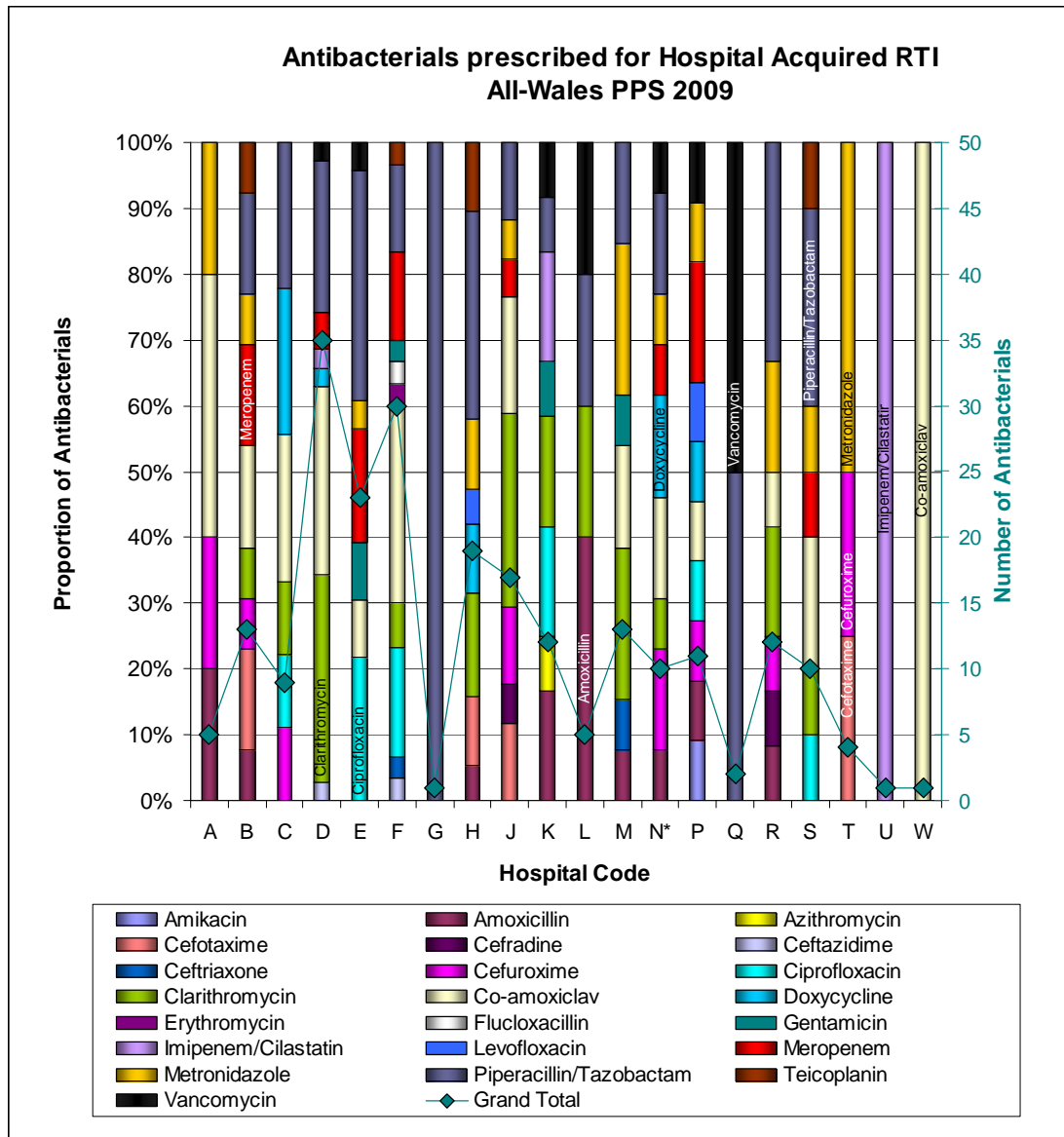


Figure 24: Antibacterials prescribed for HA-RTI

Across Wales the most commonly prescribed antibacterials for HA-RTI were piperacillin/tazobactam **20%** of all prescriptions (**10%** in 2008), clarithromycin **20%** (**26%** in 2008) and amoxicillin **15%** (**14%** in 2008). Excluding patients with multi-diagnoses, the pattern of prescribing varied widely with **36 different regimens** including monotherapies and combinations being prescribed. The most common were (total number = 149 prescriptions):

- **19** prescriptions for piperacillin/tazobactam monotherapy (**22%**)
- **7** meropenem monotherapy (**8%**)
- **5** cefuroxime plus metronidazole (**6%**); ciprofloxacin monotherapy (**6%**)
- **5** co-amoxiclav monotherapy (**6%**); co-amoxiclav plus clarithromycin (**6%**)

Dosing regimens for Hospital Acquired RTI

Piperacillin/tazobactam: Figure 25 shows that **87%** of patients diagnosed with a HA-RTI that were prescribed piperacillin/tazobactam were prescribed 4.5g parenteral pip/tazo TDS, and **11%** 4.5g parenteral pip/tazo BD.

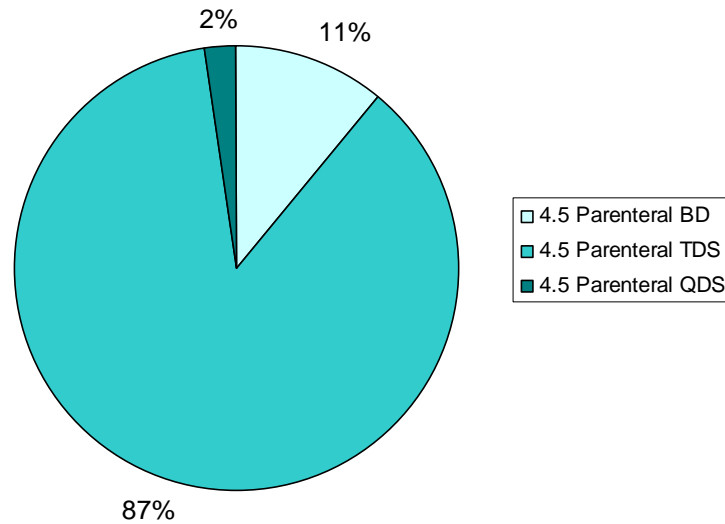


Figure 25: Prescribed dosage for treatment of HA-RTI with pip/tazo

Co-amoxiclav: Figure 26 shows that **53%** of patients diagnosed with a HA-RTI that were prescribed co-amoxiclav were prescribed 0.625g oral co-amoxiclav TDS, and **36%** were prescribed 1.2g parenteral co-amoxiclav TDS. These dosing rates are comparable to those for community acquired RTI.

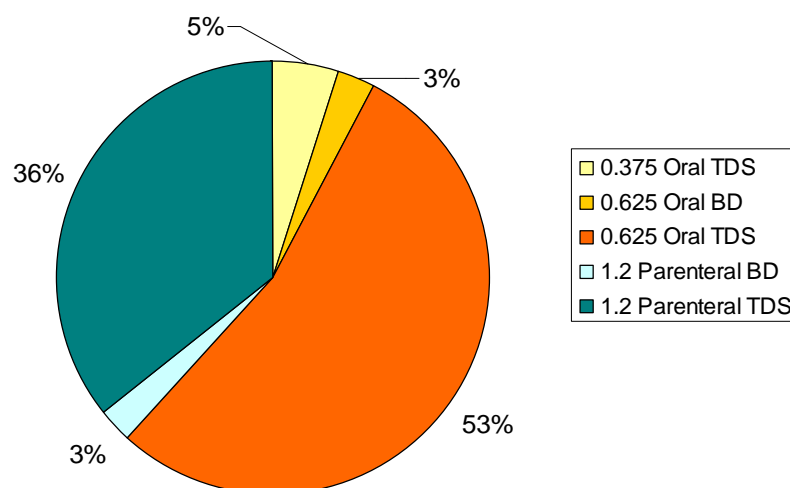


Figure 26: Prescribed dosage for treatment of HA-RTI with co-amoxiclav

The co-amoxiclav dosing prescribed by individual hospitals for the treatment of HA-RTI is shown in **Table 13** in **Appendix B**.

Hospital Acquired SSTBJ Infections

The antibacterials prescribed for the treatment of hospital acquired skin, soft tissue, bone & joint infections (HA-SSTBJ) are shown in **Figure 27**.

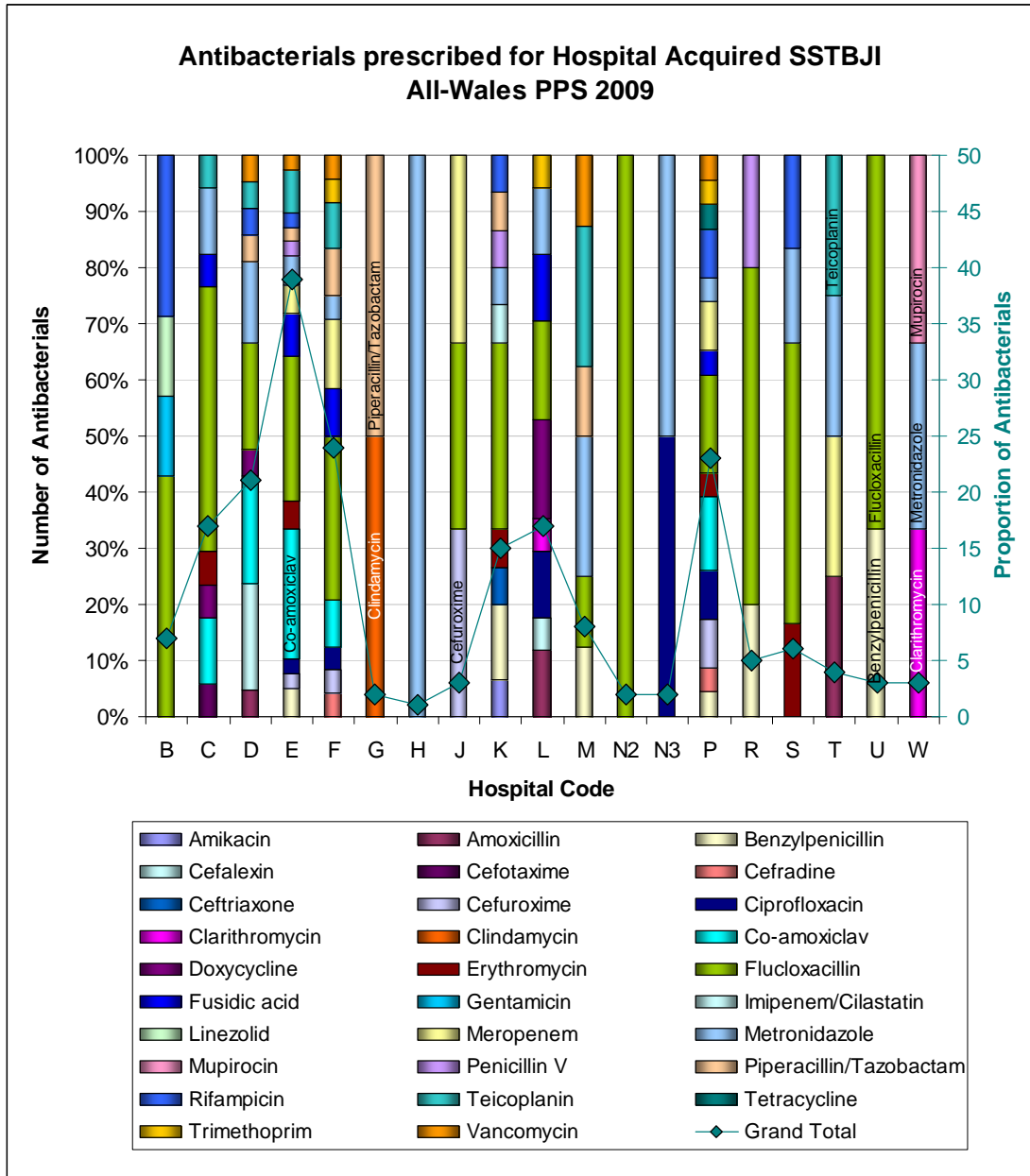


Figure 27: Antibacterials prescribed for HA-SSTBJ

Flucloxacillin (27.7%), co-amoxiclav (9.9%) & metronidazole (9.4%) were the most commonly prescribed antibacterials, comprising 47% of prescriptions for HA-SSTBJ in total. Excluding patients with multi-diagnoses, the pattern of prescribing varied widely with **49 different regimens** including monotherapies and combinations being prescribed (total number = 128 prescriptions):

- Flucloxacillin monotherapy (26 prescriptions)
- Co-amoxiclav monotherapy (14 prescriptions)

Hospital Acquired Urinary Tract Infections

The antibacterials prescribed for the treatment of hospital acquired urinary tract infections (HA-UTI) are shown in **Figure 28**. Trimethoprim (42%), ciprofloxacin (18%) and co-amoxiclav (12%) were the most commonly prescribed antibacterials, comprising 72% of prescriptions for HA-UTI in total.

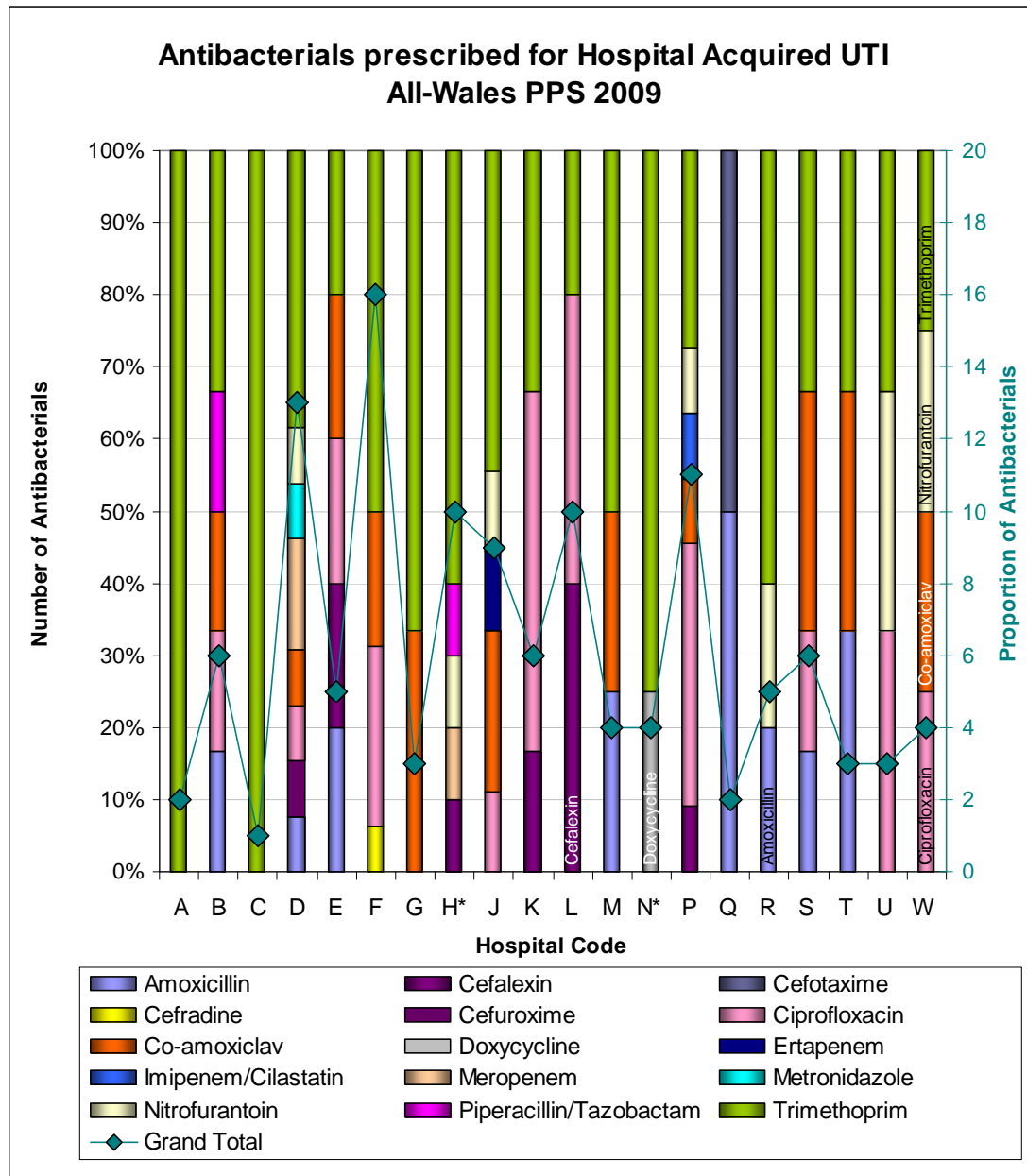


Figure 28: Antibacterials prescribed for HA-UTI

Excluding patients with multi-diagnoses, the pattern of prescribing for HA-UTI showed some variation between hospitals with **14 different regimens** mainly monotherapies but with some combination therapies being prescribed; the most common regimens were (total number = 113 prescriptions):

- Trimethoprim monotherapy (46 prescriptions)
- Ciprofloxacin monotherapy (20 prescriptions)

SURGICAL PROPHYLAXIS (INDICATION C)

The antibacterials prescribed for surgical prophylaxis (C) are show in **Table 8**.

- 226 of the 6460 patients surveyed were prescribed antimicrobial/s for surgical prophylaxis (3.5%)
- Of the 1905 patients in the survey that were prescribed antibacterials, 226 (11.9%) were prescribed surgical prophylaxis (C).
- 22 different antibacterials were prescribed within this group.

Table 8: Antibacterials prescribed by diagnosis group – indication C

Antibacterial	Antibacterial Prophylaxis Diagnosis group									
	CNS	CVS	ENT	GI	GUOB	MIX	RES	SBJ	UTI	Total
Cefuroxime	1	7	2	19	3	1		76	1	110
Co-amoxiclav		1	4	12	17		2	8	3	47
Metronidazole		3	2	24	1	1		1	1	33
Gentamicin								12	10	22
Cefotaxime		2		7					1	10
Flucloxacillin		1						9		10
Ciprofloxacin				4					5	9
Teicoplanin		5						4		9
Colistin				4						4
Tobramycin				4						4
Trimethoprim									4	4
Cefalexin			1	1				1		3
Erythromycin					2			1		3
Phenoxymethylpenicillin				1			2			3
Penicillin V		3								3
Amoxicillin							1			1
Cefradine				1						1
Ceftriaxone				1						1
Clarithromycin								1		1
Clindamycin					1					1
Piperacillin/Tazobactam									1	1
All antibacterials	1	22	9	78	24	2	5	113	26	280

The most commonly prescribed antibacterials for surgical prophylaxis were:

- Cefuroxime (39.3% compared with 35.2% in 2008)
- Co-amoxiclav (16.8% compared with 13.4% in 2008)
- Metronidazole (11.8% compared with 15.5% in 2008)
- 228 of the antibacterials prescribed for surgical prophylaxis were for IV administration (81.4% compared with 83.1% in 2008)
- 113 of the 280 antibacterials prescribed as surgical prophylaxes were for skin, soft tissue bone & joint (See **Figure 29**).

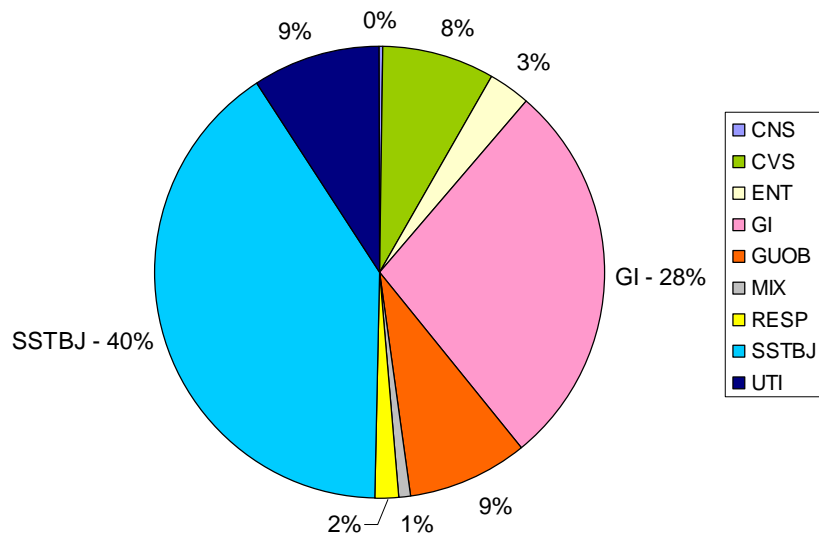


Figure 29: Antibacterials prescribed for indication **C** by diagnosis group

The PPS included three categories within surgical prophylaxis (**C**) based on the number of doses and duration of antibacterial prescribed:

- C1 – Single dose
- C2 – Multi-doses within one day
- C3 – > 1 day

The number of antibacterials prescribed for surgical prophylaxis and the proportion for more than one day duration (**C3 %**) is shown in **Table 9**.

Table 9: Antibacterials prescribed by sub-indication C1, C2 & C3

Antibacterial	C1	C2	C3	C3 % - 2009	C3% - 2008
Amoxicillin			1	100	16.7
Co-amoxiclav	18	10	19	40.4	55.3
Cefalexin	1		2	66.7	66.7
Cefotaxime	2		8	80.0	66.7
Cefradine			1	100	100
Ceftriaxone	1			0	
Cefuroxime	12	68	30	27.3	37.0
Ciprofloxacin	2		7	77.8	77.8
Clarithromycin			1	100	50
Clindamycin		1		0	
Colistin			4	100	
Erythromycin			3	100	100
Flucloxacillin	2	6	2	20.0	90
Gentamicin	21		1	4.5	5.9
Metronidazole	5	2	26	78.8	65.9
Penicillin V			3	100	100
Piperacillin/Tazo			1	100	100
Teicoplanin	1	5	3	33.3	72.7
Tobramycin			4	100	
Trimethoprim			4	100	80.0
Vancomycin			3	100	0
All antibacterials	65	92	123	43.9%	48.2%

The proportion of patients receiving surgical prophylaxis for more than one day decreased from **48.2 %** [42.5, 54.0] in 2008 to **43.9%** [38.2, 49.8] in 2009. Although the reduction in prescribing for more than one day is not statistically significant it hopefully shows movement in the right direction.

Table 10 shows the diagnosis subgroups and the proportion of antibacterials that were prescribed for more than one day duration (**C3**):

- Excluding the subgroups with less than 20 antibacterials prescribed in total (Proph CNS, Proph ENT, and Proph RES & MIX), the proportion of prescribing for more than one day was statistically lower in Proph SBJ - **20.4%** [14.0, 28.7] than any other subgroup.
- Prophylaxis for skin soft tissue bone & joint surgery was mainly prescribed for 24 hours (**C2**) – **62.8%**
- The proportion of prescribing for more than one day was statistically higher in Proph GI - **71.8%** [61.0, 81.6] than the other groups.

Table 10: Diagnosis subgroup by sub- indication C1, C2 & C3

Diagnosis subgroup	Indication C1	Indication C2	Indication C3	Proportion C3 [95% CIs]
Proph CNS		1		0.0 [0.0, 79.3]
Proph CVS	5	6	11	50.0 [30.7, 69.3]
Proph ENT		1	8	88.9 [56.5, 98.0]
Proph GI	17	5	56	71.8 [61.0, 81.6]
Proph GyOb	13	6	5	20.8 [9.2, 40.5]
Proph RES		1	4	80.0 [37.6, 96.4]
Proph SBJ	19	71	23	20.4 [14.0, 28.7]
Proph UT	11	1	14	53.8 [35.5, 71.2]
MIX			2	100 [34.2, 100]
All diagnosis - 2009	65	92	123	43.9% [38.2, 49.8]
All diagnosis - 2008	66	81	137	48.2% [42.5, 54.0]

The diagnosis subgroups & sub-indications at individual hospital level are shown in **Table 14** in **Appendix B**. The top four antibacterials prescribed as surgical prophylaxis (cefuroxime, metronidazole, co-amoxiclav & gentamicin) and the sub-indications are shown in **Table 15** in **Appendix B**.

Overall the proportion of prescribing of the top four antimicrobials for more than one day decreased from **41.2%** [34.8, 47.9] in 2008 to **35.8%** [29.7, 42.5] in 2009.

MEDICAL PROPHYLAXIS (INDICATION D)

The antibacterials prescribed for medical prophylaxis (D) are show in **Table 9**.

- 86 of the 6460 patients surveyed were prescribed antimicrobial/s for medical prophylaxis (1.3%)
- Of the 1905 patients in the survey that were prescribed antibacterials, 86 (4.5%) were prescribed medical prophylaxis (D).
- 23 different antibacterials were prescribed within this group.

Table 11: Antibacterials prescribed by diagnosis group – indication D

Antibacterial	Prophylaxis Diagnosis Group								Total
	Prokinetic	CNS	CVS	GI	RES	SBJ	UT	UND	
Co-trimoxazole					22			1	23
Trimethoprim							21		21
Ciprofloxacin				4	10		2	1	17
Penicillin V				1	9	1		2	13
Azithromycin					12				12
Colistin					10				10
Metronidazole				8					8
Gentamicin					4			1	5
Nitrofurantoin							5		5
Cefalexin							4		4
Cefotaxime				3	1				4
Benzylopenicillin					2			1	3
Doxycycline					1	1		1	3
Erythromycin	1			1	1				3
Vancomycin		1		2					3
Amoxicillin					1			1	2
Co-amoxiclav				1	1				2
Ceftriaxone				2					2
Cefuroxime				2					2
Clarithromycin					2				2
Flucloxacillin			2						2
Meropenem				1	1				2
Piperacillin/Tazobactam				1	1				2
Tobramycin					2				2
Ceftazidime					1				1
Minocycline					1				1
Pivmecillinam							1		1
Rifampicin						1			1
Rifaximine				1					1
All antibacterials	1	1	2	27	82	3	33	8	157

- Co-trimoxazole was the most commonly prescribed antibacterial for this group (14.6%)
- Trimethoprim long term therapy was used solely as prophylaxis for urinary tract infections.
- Penicillin V was largely prescribed as prophylaxis post-splenectomy.
- 52.2% of the antibacterials in this group were prescribed for Proph RES and reflect the large number of cystic fibrosis patients in this group.

SPECIFIC DIAGNOSIS GROUPS

Bacteraemia

Antibacterials that were prescribed for bacteraemia are shown in **Figure 30**.

- 65 of the 6460 patients surveyed were prescribed antibacterials for the treatment of bacteraemia (**1.0%**)
- Of the 65 patients diagnosed with a bacteraemia:
 - 23 (**35.4%**) were classed as community acquired (**Indication A**)
 - 42 (**64.6%**) were classed as hospital acquired (**Indication B**)
- 20 different antibacterials were prescribed within this group.

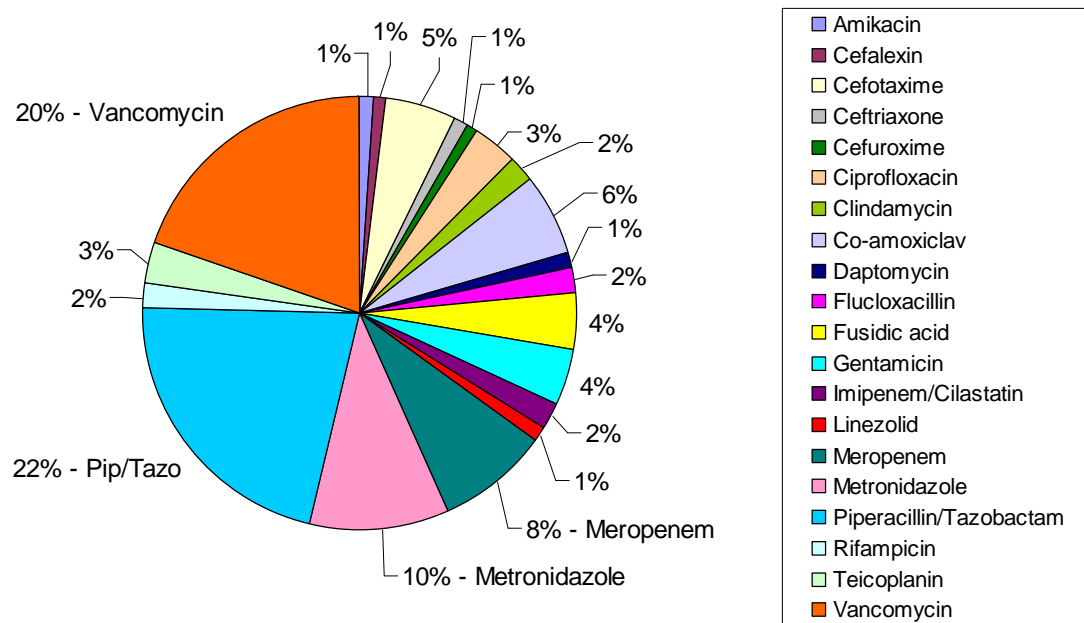


Figure 30: Antibacterials prescribed for bacteraemia (%)

Piperacillin/tazobactam (**22%**), vancomycin (**20%**), metronidazole (**10%**), and meropenem (**8%**) were the most commonly prescribed antibacterials comprising **60%** of prescriptions for bacteraemias (97 antibacterials in total).

Excluding patients with multi-diagnoses, the pattern of prescribing varied widely with **29 different regimens** including monotherapies and combinations being prescribed; the most common were:

- Piperacillin/tazobactam monotherapy (6 prescriptions)
- Vancomycin monotherapy (5 prescriptions)

Pneumonia

Antibacterials that were prescribed for pneumonia are shown in **Figure 31**.

- 237 of the 6460 patients surveyed were prescribed antibacterials for the treatment of pneumonia (**3.7%**)
- Of the 237 patients diagnosed with pneumonia:
 - 134 (**56.5%**) were classed as **Indication A**
 - 103 (**43.5%**) were classed as **Indication B**
- 27 different antibacterials were prescribed within this group

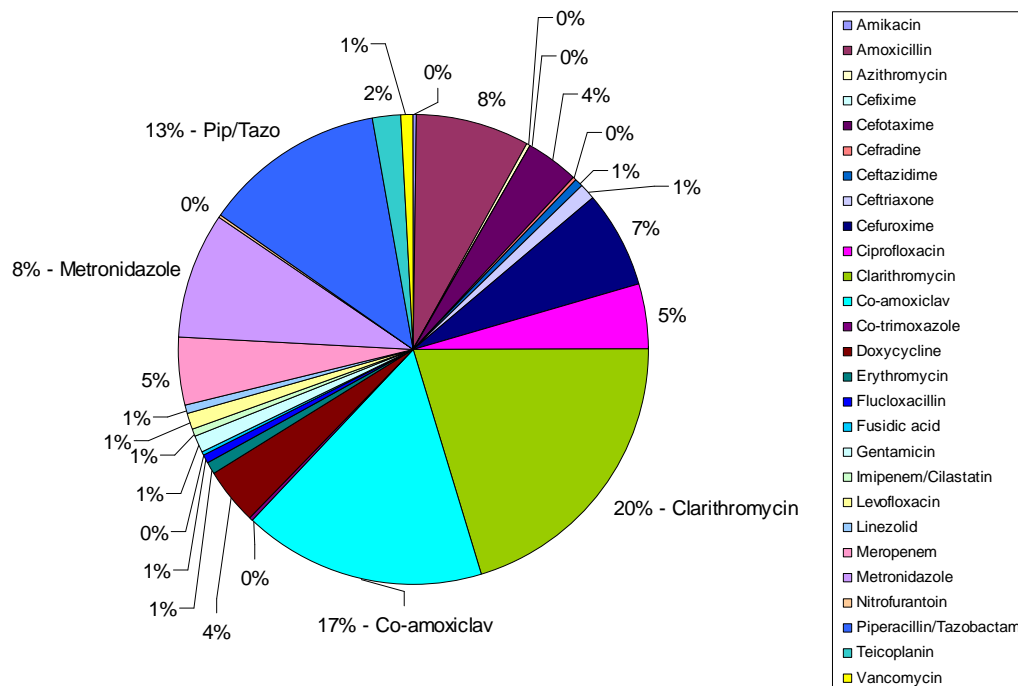


Figure 31: Antibacterials prescribed for pneumonia (%)

Clarithromycin (**20%**), co-amoxiclav (**17%**), and piperacillin/tazobactam (**13%**) were the most commonly prescribed antibacterials for pneumonia, comprising **50%** of prescriptions (366 antibacterials in total).

Excluding patients with multi-diagnoses, the pattern of prescribing varied widely with **29 different regimens** including monotherapies and combinations being prescribed; the most common were:

- Co-amoxiclav plus clarithromycin (27 prescriptions)
- Piperacillin/tazobactam monotherapy (23 prescriptions)
- Amoxicillin plus clarithromycin (12 prescriptions)

Pyelonephritis

Antibacterials that were prescribed for the treatment of pyelonephritis are shown in **Figure 32**.

- 36 of the 6460 patients surveyed were prescribed antibacterials for the treatment of pyelonephritis (**0.6%**)
- Of the 36 patients diagnosed with pyelonephritis:
 - 24 (**66.7%**) were classed as **Indication A**
 - 12 (**33.3%**) were classed as **Indication B**
- 16 different antibacterials were prescribed within this group.

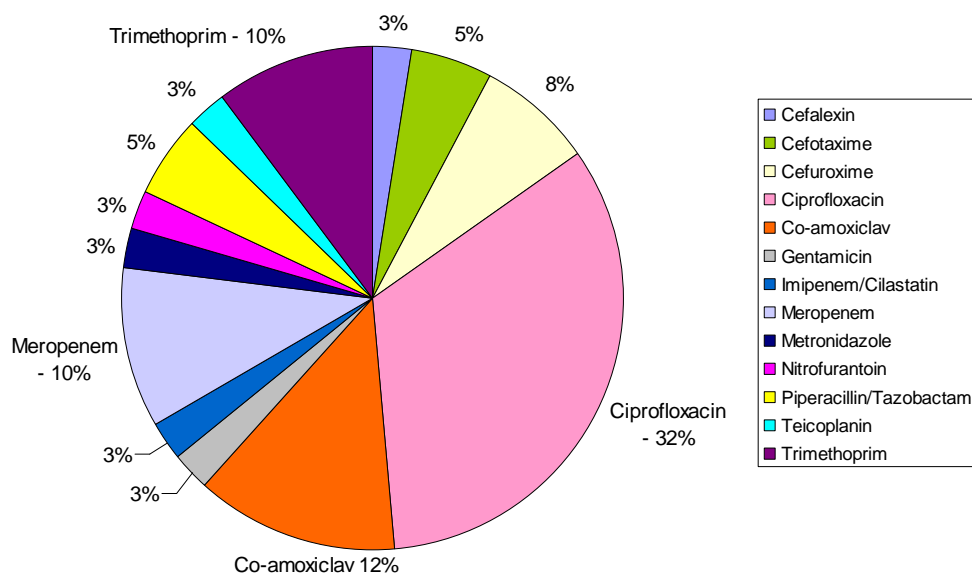


Figure 32: Antibacterials prescribed for pyelonephritis (%)

Ciprofloxacin (**32%**), co-amoxiclav (**12%**), trimethoprim (**10%**), & meropenem (**10%**) were the most commonly prescribed antibacterials, comprising **64%** of prescriptions for pyelonephritis (28 antibacterials in total).

Excluding patients with multi-diagnoses **13 different regimens** predominantly monotherapies were prescribed and the most common were:

- Ciprofloxacin monotherapy (12 prescriptions)
- Co-amoxiclav monotherapy (4 prescriptions)

SIRS

Antibacterials that were prescribed for the treatment of systemic inflammatory response with no clear anatomical site (SIRS) are shown in **Figure 33**.

- 54 of the 6460 patients surveyed were prescribed antimicrobial/s for the treatment of SIRS (**0.8%**)
- Of the 54 patients diagnosed with SIRS:
 - 39 (**56.4%**) were classed as **Indication A**
 - 15 (**28.2%**) were classed as **Indication B**
- 19 different antibacterials were prescribed within this group

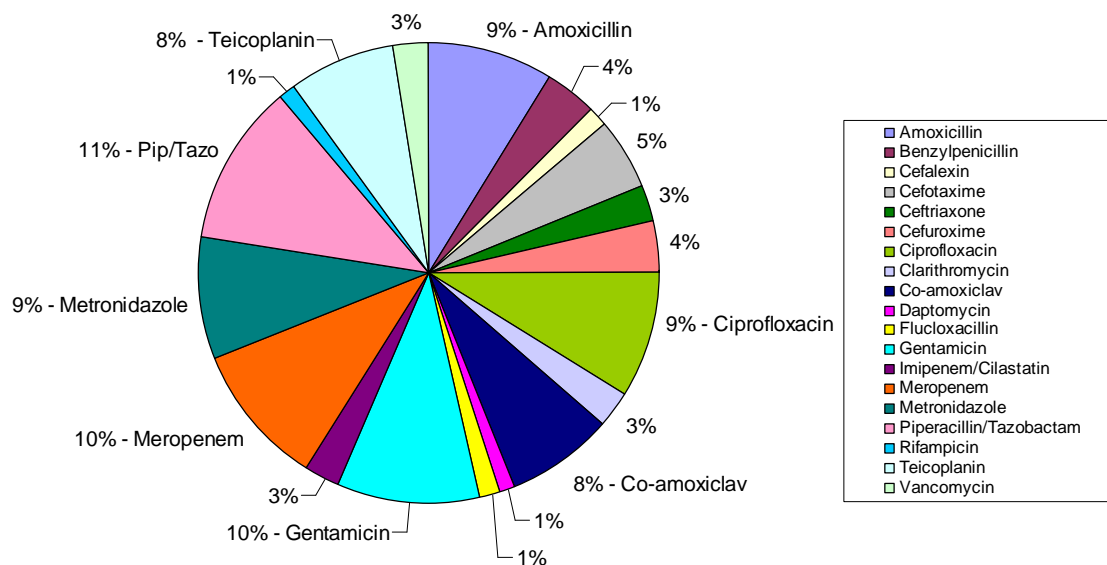


Figure 33: Antibacterials prescribed for SIRS (%)

Piperacillin/tazobactam (**11%**), meropenem (**10%**), gentamicin (**10%**), amoxicillin (**9%**), ciprofloxacin (**9%**), and metronidazole (**9%**) were the most commonly prescribed antibacterials, comprising **58%** of prescriptions for SIRS (80 antibacterials in total).

Excluding patients with multi-diagnoses, the pattern of prescribing for SIRS varied widely with **28 different regimens** including monotherapies and combinations being prescribed; the most common were:

- Ciprofloxacin monotherapy (6 prescriptions)
- Amoxicillin plus cefotaxime (4 prescriptions)

UND

Antibacterials that were prescribed for the treatment of infection from an un-defined site with no systemic inflammation (UND) are shown in **Figure 34**.

- 17 of the 6460 patients surveyed were prescribed antimicrobial/s for the treatment of UND (**0.3%**)
- Of the 17 patients diagnosed with UND:
 - 7 (**41.2%**) were classed as **Indication A**
 - 3 (**17.6%**) were classed as **Indication B**
 - 7 (**41.2%**) were classes as **Indication D**
- 13 different antibacterials were prescribed within this group

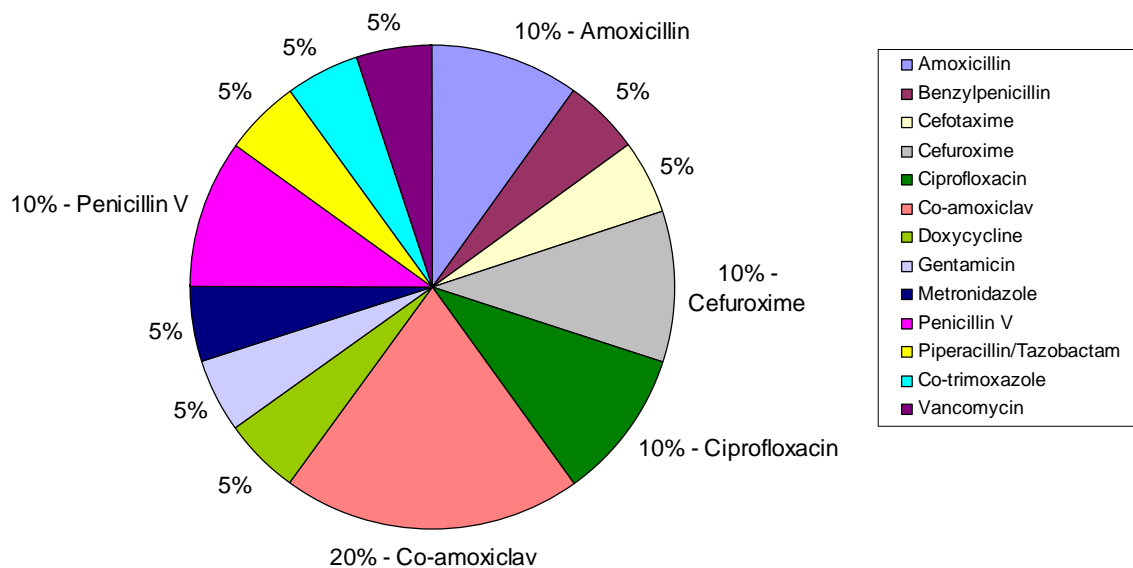


Figure 34: Antibacterials prescribed for UND (%)

The numbers in this group were too small to analyse.

ANTIFUNGALS, ANTIVIRALS & TOPICAL ANTIMICROBIALS

The antifungal, antiviral and topical antimicrobial prescribing recorded in the 2009 PPS are shown in **Table 10**; as previously stated it is unclear if this is a complete record of prescribing for these antimicrobial drug groups or if some hospitals selectively audited systemic antibacterial prescribing only. **42.2%** of prescribing for this group was recorded in UHW.

Table 10: Antifungal, antiviral & topical antimicrobial prescribed by indication and route of administration.

Antimicrobial	Route	Indication			
		A	B	C	D
Abacavir	Oral				2
Aciclovir	Oral, Parenteral & Topical	10	8		17
Amphotericin	Parenteral	2	1		2
Atripla (combined HIV)	Oral				1
Caspofungin	Parenteral	2			
Chloramphenicol	Oral & Topical	3	6		
Clotrimazole	Topical	1	5		
Dapsone	Oral				1
Fluconazole	Oral & Parenteral	7	19		5
Itraconazole	Oral	1			5
Lamivudine	Oral				1
Maraviroc	Oral				1
Miconazole	Topical				1
Mupirocin	Topical		3		
Nevirapine	Oral				1
Nystatin	Oral & Topical	2	12	4	3
Oseltamivir	Oral	5			5
Posaconazole	Oral				1
Ribavirin	Inhaled	1			
SDD paste	Oral				4
Sofradex	Topical	1			
Tenofovir	Oral				1
Triclosan	Topical		2		
Valaciclovir	Oral				3
Valganciclovir	Oral	1	1		2
Voriconazole	Oral				1
All antifungals, antivirals & topical agents		36	57	4	57

Amazingly these 154 antimicrobials were included in **86 different regimens** and only 28 were monotherapies:

- Fluconazole (6 prescriptions)
- Aciclovir & Chloramphenicol (5 prescriptions each)
- Nystatin (4 prescriptions)
- Clotrimazole (3 prescriptions)
- Oseltamivir (2 prescriptions)
- Miconazole, mupirocin, Sofradex and voriconazole (1 prescription)

APPENDIX A

Wales Point Prevalence Survey 2009

Patient Form (Please fill in one form per patient)

Patient Identifier (Hospital Number)	Survey Number ^b	Age ^c	DOB ^d	Sex	Hospital	Ward

^a Please enter the patients hospital number to allow local linkage to patient records for more detailed audit if required. NB this identifier will not be entered onto the electronic database and is for internal use only.

^b A unique but non-identifiable number for each patient entered in the survey by this hospital; it is suggested that consecutive number are used. This number will be used in the electronic database and will be used in any communications regarding individual data.

Essential Fields								
Drug	Unit Dose ¹	Doses per day ²	Route ³	Diagnosis ⁴		Indication ⁵	Reason in notes (Yes/No)	Day of Therapy ⁶
				Site	Code			
Cefuroxime	1.5g	1	P	SSTBJ	Proph SBJ	C1	No	Stat
1								
2								
3								
4								
5								

¹ Dose per administration in grams: for combination products record the total dose prescribed (e.g. co-amoxiclav 1.2 G; co-trimoxazole 0.96 G).

² Provide fractions of doses if necessary, e.g. every 16h = 1.5 doses per day, every 36h = 0.67 doses per day, every 48h = 0.5 doses per day

³ Parenteral (injections), oral, rectal, inhalation (or **P, O, R, I**)

⁴ Diagnosis – **please enter both diagnosis site and diagnosis code** as shown in grey shaded area of table

⁵ Indication – please enter indication code

⁶ Day of therapy – please enter the day as a numeric e.g. **7**, or '**Stat**' for stat doses, or '**LT**' (Long term) for life long prophylaxis e.g. penicillin for post-splenectomy or nitrofurantoin prophylaxis against recurrent UTI

APPENDIX B

Table 1: Ward Information

Survey	Hospital Code	Ward	Specialty	Patient Number	No. AMx	No. ABx	% ABx
19/11/2009	A	ICU	Intensive Care	3	3	3	100
19/11/2009	A	Iorwerth	Medicine	24	5	5	20.8
19/11/2009	A	Llewelyn	Surgery	16	4	4	25.0
27/11/2009	A	Meurig	Medicine	12	5	4	33.3
19/11/2009	A	Owain Glyndwr	Surgery	32	3	3	9.4
19/11/2009	A	Rheidol	Medicine	16	8	7	43.8
17/11/2009	B	2	Medicine	28	14	14	50.0
17/11/2009	B	4	Medicine	29	3	3	10.3
17/11/2009	B	5	Medicine	26	9	9	34.6
17/11/2009	B	6	Medicine	27	11	11	40.7
17/11/2009	B	7	Surgery	28	9	9	32.1
17/11/2009	B	8	Surgery	28	7	7	25.0
17/11/2009	B	9	Surgery	14	2	2	14.3
17/11/2009	B	10	Surgery	29	14	14	48.3
17/11/2009	B	16	Medicine	15	3	3	20.0
17/11/2009	B	18	Medicine	25	2	2	8.0
17/11/2009	B	CDU	Medicine & Surgery	28	10	10	35.7
17/11/2009	B	Children	Medicine & Surgery	12	4	4	33.3
17/11/2009	B	ITU	Intensive Care	11	8	8	72.7
17/11/2009	B	SCBU	Intensive Care	6	3	3	50.0
17/11/2009	B	W11	Surgery	16	1	1	6.3
01/12/2009	C	Fifteen	Medicine	28	11	11	39.3
01/12/2009	C	One	Surgery	24	11	11	45.8
01/12/2009	C	Sixteen	Medicine	15	6	6	40.0
01/12/2009	C	Three	Surgery	25	7	7	28.0
01/12/2009	C	W19	Medicine	28	10	10	35.7
01/12/2009	C	W2	Surgery	26	15	15	57.7
01/12/2009	C	W20	Medicine	28	9	9	32.1
01/12/2009	C	W4	Surgery	19	3	3	15.8
26/11/2009	D	B3 E/W	Medicine	22	6	6	27.3
26/11/2009	D	B4	Surgery	18	4	4	22.2
26/11/2009	D	B5	Surgery	19	1	1	5.3
26/11/2009	D	B6 E/W	Medicine	25	4	4	16.0
26/11/2009	D	B6 North	Medicine	11	4	3	27.3
26/11/2009	D	B7	Surgery	28	7	7	25.0
26/11/2009	D	C4 E	Medicine	28	11	11	39.3
26/11/2009	D	C4 W	Medicine	25	6	6	24.0
26/11/2009	D	C5 E	Surgery	31	9	9	29.0
26/11/2009	D	C5 W	Surgery	29	8	8	27.6
26/11/2009	D	C6 E	Medicine	32	10	11	34.4
26/11/2009	D	C6 W	Medicine	30	13	11	36.7
26/11/2009	D	C7 E	Surgery	26	8	8	30.8
26/11/2009	D	C7 W	Surgery	30	3	3	10.0
26/11/2009	D	CCU	Medicine	5	0	0	0.0
26/11/2009	D	D1 W	Medicine	24	6	6	25.0
26/11/2009	D	D2 E	Medicine	21	6	6	28.6
26/11/2009	D	D2 W	Surgery	28	13	13	46.4
26/11/2009	D	D3 E	Medicine	30	4	2	6.7
26/11/2009	D	D3 W	Medicine	12	3	5	41.7
26/11/2009	D	D4 E	Medicine	23	6	6	26.1
26/11/2009	D	D4 W	Medicine	26	8	8	30.8
26/11/2009	D	D5 E ext (SAU)	Surgery	11	5	5	45.5
26/11/2009	D	D5 W	Surgery	27	9	9	33.3
26/11/2009	D	D6 E	Paediatrics	11	2	2	18.2
26/11/2009	D	D6 W	Paediatrics	14	3	3	21.4
26/11/2009	D	D7 East	Surgery	20	2	2	10.0
26/11/2009	D	D7 W	Paediatrics	14	4	4	28.6
26/11/2009	D	Eye	Medicine & Surgery	7	0	0	0.0
26/11/2009	D	HDU	Intensive Care	5	3	3	60.0
26/11/2009	D	ICU	Intensive Care	9	8	8	88.9
26/11/2009	D	MAU	Medicine	11	2	2	18.2
26/11/2009	D	OSU	Surgery	33	10	10	30.3
26/11/2009	D	SCBU	Intensive Care	19	5	5	26.3

Survey	Hospital Code	Ward	Specialty	Patient Number	No. AMx	No. ABx	% ABx
26/11/2009	D	SSU	Medicine	9	1	1	11.1
16/11/2009	E	A	Surgery	18	4	4	22.2
16/11/2009	E	Anglesey	Surgery	18	4	4	22.2
16/11/2009	E	B	Surgery	26	3	3	11.5
20/11/2009	E	C	Surgery	28	8	8	28.6
17/11/2009	E	Cardigan	Medicine	23	12	12	52.2
18/11/2009	E	CCU	Medicine	8	0	0	0.0
18/11/2009	E	CHDU	Surgery/ICU	4	3	3	75.0
18/11/2009	E	CITU	Surgery/ICU	6	4	4	66.7
12/01/1900	E	Clydach	Surgery	11	4	4	36.4
18/11/2009	E	Cyril Evans	Surgery	25	3	3	12.0
19/11/2009	E	D	Surgery	19	5	5	26.3
16/11/2009	E	Dyfed	Surgery	10	1	1	10.0
17/11/2009	E	E	Surgery	23	12	11	47.8
19/11/2009	E	F	Medicine	24	4	4	16.7
19/11/2009	E	G	Surgery	20	6	6	30.0
17/11/2009	E	Gower	Medicine	26	5	5	19.2
20/11/2009	E	H	Surgery	27	8	8	29.6
16/11/2009	E	ITU North	Intensive Care	5	2	2	40.0
19/11/2009	E	ITU South	Intensive Care	5	5	5	100
16/11/2009	E	ITU-E	Intensive Care	4	3	3	75.0
16/11/2009	E	ITU-S (HDU)	Intensive Care	6	3	3	50.0
16/11/2009	E	J	Surgery	17	2	2	11.8
20/11/2009	E	M	Surgery	24	5	5	20.8
16/11/2009	E	MAU	Medicine	17	4	4	23.5
20/11/2009	E	Oakwood	Medicine	27	9	9	33.3
16/11/2009	E	Pembroke	Surgery	15	9	9	60.0
20/11/2009	E	Powys	Surgery	7	1	1	14.3
16/11/2009	E	PSMU	Surgery	3	2	2	66.7
16/11/2009	E	R	Medicine	28	7	7	25.0
18/11/2009	E	S	Medicine	27	8	8	29.6
18/11/2009	E	T	Medicine	28	12	12	42.9
17/11/2009	E	Tempest	Surgery	1	1	1	100
16/11/2009	E	Ty-Olwen	Medicine	8	1	1	12.5
16/11/2009	E	V	Medicine	27	8	8	29.6
19/11/2009	E	W	Surgery	23	4	4	17.4
17/12/2009	F	A1L	Medicine & Surgery	20	6	6	30.0
17/12/2009	F	A1M	Medicine	38	10	10	26.3
17/12/2009	F	A2	Surgery	38	15	14	36.8
17/12/2009	F	A3 HDU	Intensive Care	13	5	5	38.5
17/12/2009	F	A3L	Medicine	26	8	8	30.8
17/12/2009	F	A3N & B3S	Intensive Care	13	7	7	53.8
17/12/2009	F	A4	Surgery	38	9	9	23.7
17/12/2009	F	A5S	Surgery	19	10	8	42.1
17/12/2009	F	A6	Surgery	38	11	11	28.9
17/12/2009	F	A7	Medicine	33	13	9	27.3
17/12/2009	F	B1	Surgery	38	1	1	2.6
17/12/2009	F	B2N	Surgery	19	5	5	26.3
17/12/2009	F	B4 Neuro	Surgery	35	8	8	22.9
17/12/2009	F	B4H	Medicine	25	15	15	60.0
17/12/2009	F	B5	Medicine & Surgery	33	14	14	42.4
17/12/2009	F	B6N	Medicine	18	4	4	22.2
17/12/2009	F	B7	Medicine	38	12	12	31.6
17/12/2009	F	C1M	Medicine	35	3	3	8.6
17/12/2009	F	C2	Medicine & Surgery	38	16	13	34.2
17/12/2009	F	C4 Thoracic	Medicine & Surgery	9	3	4	44.4
17/12/2009	F	C4N	Medicine	18	3	3	16.7
17/12/2009	F	C4R	Medicine	7	4	3	42.9
17/12/2009	F	C5	Medicine & Surgery	35	8	8	22.9
17/12/2009	F	C6	Medicine	38	11	10	26.3
17/12/2009	F	C7 South	Medicine & Surgery	19	3	5	26.3
17/12/2009	F	C7N	Medicine	17	5	3	17.6
17/12/2009	F	CCU	Medicine	7	1	1	14.3
17/12/2009	F	Heulwen	Paediatrics	9	4	4	44.4
17/12/2009	F	ITU C	Intensive Care	7	4	4	57.1
17/12/2009	F	Land	Paediatrics	22	12	9	40.9

Survey	Hospital Code	Ward	Specialty	Patient Number	No. AMx	No. ABx	% ABx
17/12/2009	F	Ocean	Paediatrics	18	4	4	22.2
17/12/2009	F	Ocean	Paediatrics	18	4	4	22.2
17/12/2009	F	PICU	Intensive Care	7	5	5	71.4
17/12/2009	F	SCBU	Intensive Care	19	7	7	36.8
17/12/2009	F	Sky	Paediatrics	6	5	5	83.3
17/12/2009	F	TCTU	Medicine	3	3	2	66.7
17/12/2009	F	YPU	Surgery	7	2	2	28.6
26/11/2009	G	3	Surgery	22	6	6	27.3
26/11/2009	G	4	Surgery	27	9	9	33.3
26/11/2009	G	7	Medicine	29	8	8	27.6
26/11/2009	G	11	Medicine	21	1	1	4.8
26/11/2009	G	12	Medicine	26	4	4	15.4
26/11/2009	G	ACDU	Medicine	14	6	6	42.9
26/11/2009	G	CCU	Medicine	11	3	3	27.3
26/11/2009	G	One	Surgery	29	7	7	24.1
19/11/2009	H	ACU/CCU	Medicine	23	2	2	8.7
19/11/2009	H	Alyn	Medicine	4	0	0	0.0
19/11/2009	H	Bedwen	Medicine	27	2	2	7.4
19/11/2009	H	Bonney	Surgery	21	5	5	23.8
19/11/2009	H	Cunliffe	Medicine	25	9	9	36.0
19/11/2009	H	Erddig	Medicine	25	19	19	76.0
19/11/2009	H	Evington	Medicine	26	8	8	30.8
19/11/2009	H	Glyndwr	Surgery	7	1	1	14.3
19/11/2009	H	Gwenfro	Medicine	7	2	2	28.6
19/11/2009	H	ITU	Intensive Care	3	2	2	66.7
19/11/2009	H	Lister	Surgery	15	2	2	13.3
19/11/2009	H	Llyn-Y-Groes	Adult Mental Health	29	0	0	0.0
19/11/2009	H	Mason	Medicine	26	12	12	46.2
19/11/2009	H	MAU	Medicine	23	8	8	34.8
19/11/2009	H	MH DU	Medicine	2	2	2	100
19/11/2009	H	Morris	Medicine	26	10	10	38.5
19/11/2009	H	Onnen	Medicine	21	2	2	9.5
19/11/2009	H	Pantomime	Surgery	18	6	6	33.3
19/11/2009	H	Prince of Wales	Surgery	22	3	3	13.6
19/11/2009	H	SAU	Surgery	9	0	0	0.0
19/11/2009	H	SHDU	Surgery	3	2	2	66.7
19/11/2009	H2	Gladstone	Community Hospital	18	3	3	16.7
19/11/2009	J	CCU	Medicine	10	1	1	10.0
19/11/2009	J	CDU	Medicine	10	4	4	40.0
19/11/2009	J	Ceri	Surgery	16	4	4	25.0
19/11/2009	J	Cleddau	Surgery	28	7	7	25.0
19/11/2009	J	Derwen	Surgery	21	10	10	47.6
19/11/2009	J	Dewi	Medicine	20	7	7	35.0
19/11/2009	J	Gwenllian	Medicine	20	1	1	5.0
19/11/2009	J	HDU	Intensive Care	6	3	3	50.0
19/11/2009	J	ICU	Intensive Care	5	4	3	60.0
19/11/2009	J	Merlin	Surgery	19	3	3	15.8
19/11/2009	J	Padarn	Medicine	21	6	6	28.6
19/11/2009	J	Preseli	Surgery	16	6	6	37.5
19/11/2009	J	SSU	Medicine	10	3	3	30.0
19/11/2009	J	Steffan	Medicine	19	4	4	21.1
19/11/2009	J	Teifi Left	Surgery	15	7	7	46.7
19/11/2009	J	Teifi Right	Surgery	16	2	2	12.5
19/11/2009	J	Towy	Medicine	20	4	4	20.0
17/11/2009	K	Alaw	Medicine	18	8	8	44.4
17/11/2009	K	Aran	Surgery	28	7	7	25.0
18/11/2009	K	CCU	Medicine	5	1	1	20.0
18/11/2009	K	CDS	Medicine	4	0	0	0.0
18/11/2009	K	Cybi	Intensive Care	8	6	6	75.0
18/11/2009	K	Dewi	Medicine	14	3	3	21.4
18/11/2009	K	Dulas	Surgery	20	13	13	65.0
18/11/2009	K	Enlli	Surgery	16	16	16	100
17/11/2009	K	Ffrancon	Surgery	13	2	2	15.4
18/11/2009	K	Glaslyn	Medicine	29	11	10	34.5
18/11/2009	K	Glyder	Medicine	18	6	6	33.3
18/11/2009	K	Gogarth	Medicine	30	9	9	30.0

Survey	Hospital Code	Ward	Specialty	Patient Number	No. AMx	No. ABx	% ABx
17/11/2009	K	HDU	Surgery	2	2	2	100
18/11/2009	K	Hebog	Medicine	30	13	13	43.3
18/11/2009	K	Llifan	Medicine	20	1	1	5.0
18/11/2009	K	Minffordd	Medicine	5	2	2	40.0
17/11/2009	K	Moelwyn	Medicine	30	23	23	76.7
17/11/2009	K	Ogwen	Surgery	28	9	9	32.1
18/11/2009	K	Prysor	Medicine	16	3	3	18.8
18/11/2009	K	SCBU	Medicine	4	3	3	75.0
17/11/2009	K	Tegid	Surgery	30	11	11	36.7
17/11/2009	K	Tryfan	Medicine	24	9	9	37.5
17/11/2009	K	Tudno	Surgery	22	1	1	4.5
19/11/2009	L	ABH Ward 6	Surgery	11	4	4	36.4
19/11/2009	L	ABH Ward 8	Surgery	20	2	2	10.0
19/11/2009	L	AMU	Medicine	28	7	6	21.4
19/11/2009	L	Brynmor	Medicine	4	1	1	25.0
19/11/2009	L	CCU	Medicine	4	2	2	50.0
19/11/2009	L	Dinas F	Medicine	12	0	0	0.0
19/11/2009	L	Dinas M	Medicine	9	0	0	0.0
19/11/2009	L	Enfys	Medicine	17	10	9	52.9
19/11/2009	L	ITU	Intensive Care	8	6	6	75.0
19/11/2009	L	SCBU	Intensive Care	4	2	2	50.0
19/11/2009	L	Tegid F	Medicine	8	0	0	0.0
19/11/2009	L	Tegid M	Medicine	5	0	0	0.0
19/11/2009	L	Ward 1	Medicine	30	12	12	40.0
19/11/2009	L	Ward 10	Surgery	15	4	4	26.7
19/11/2009	L	Ward 11	Medicine	29	9	9	31.0
19/11/2009	L	Ward 12	Medicine	30	15	15	50.0
19/11/2009	L	Ward 14	Medicine	27	13	13	48.1
19/11/2009	L	Ward 17	Medicine	19	4	4	21.1
19/11/2009	L	Ward 18	Medicine	8	4	4	50.0
19/11/2009	L	Ward 19	Surgery	18	7	7	38.9
19/11/2009	L	Ward 2	Medicine	29	8	8	27.6
19/11/2009	L	Ward 20 / SCBU	Medicine	12	1	1	8.3
19/11/2009	L	Ward 21	Medicine & Surgery	4	0	0	0.0
19/11/2009	L	Ward 22	Medicine	14	2	2	14.3
19/11/2009	L	Ward 3	Surgery	28	12	12	42.9
19/11/2009	L	Ward 4	Surgery	24	6	5	20.8
19/11/2009	L	Ward 5	Surgery	28	9	9	32.1
19/11/2009	L	Ward 6	Surgery	27	13	13	48.1
19/11/2009	L	Ward 7	Surgery	21	11	11	52.4
19/11/2009	L	Ward 9	Medicine	28	7	7	25.0
20/11/2009	M	2/1	Surgery	9	4	4	44.4
20/11/2009	M	3/1	Surgery	19	1	1	5.3
20/11/2009	M	4/1	Medicine	32	14	14	43.8
20/11/2009	M	3/2	Surgery	23	4	4	17.4
20/11/2009	M	4/2	Medicine	32	5	5	15.6
20/11/2009	M	2/3	Paediatrics	13	1	1	7.7
20/11/2009	M	3/3	Surgery	31	5	5	16.1
20/11/2009	M	4/3	Medicine	31	4	4	12.9
20/11/2009	M	2/4	Medicine	22	4	4	18.2
20/11/2009	M	3/4	Surgery	33	14	13	39.4
20/11/2009	M	4/4	Medicine	32	12	12	37.5
20/11/2009	M	CCU	Medicine	5	0	0	0.0
20/11/2009	M	EAU 0/2	Medicine & Surgery	27	7	7	25.9
20/11/2009	M	Glan Usk	Surgery	5	1	1	20.0
20/11/2009	M	ITU	Intensive Care	4	4	4	100
20/11/2009	M	NNU	Intensive Care	8	2	2	25.0
24/11/2009	N	1	Surgery	20	5	5	25.0
19/11/2009	N	2	Surgery	19	12	12	63.2
19/11/2009	N	3	Surgery	30	10	10	33.3
19/11/2009	N	4	Surgery	29	6	6	20.7
19/11/2009	N	6	Surgery	25	4	4	16.0
19/11/2009	N	9	Medicine	30	5	5	16.7
19/11/2009	N	10	Medicine	30	15	15	50.0
19/11/2009	N	19	Medicine	24	7	7	29.2
19/11/2009	N	20	Medicine	16	7	7	43.8

Survey	Hospital Code	Ward	Specialty	Patient Number	No. AMx	No. ABx	% ABx
19/11/2009	N	31	Paediatrics	16	4	4	25.0
19/11/2009	N	32	Paediatrics	8	0	0	0.0
19/11/2009	N	34 - Admissions	Medicine	24	5	5	20.8
19/11/2009	N	CCU	Medicine	5	2	2	40.0
19/11/2009	N	Intensive Care	Intensive Care	4	4	4	100
19/11/2009	N	SCBU	Intensive Care	6	0	0	0.0
19/11/2009	N	Surgical Admissions	Medicine	1	1	1	100
19/11/2009	N2	Cwmdare	Medicine	12	0	0	0.0
19/11/2009	N2	Cyfartha	Medicine	24	0	0	0.0
19/11/2009	N2	Dowlais	Medicine	9	1	1	11.1
19/11/2009	N2	Glyndwr	Medicine	24	2	2	8.3
19/11/2009	N2	Morlais	Medicine	11	0	0	0.0
19/11/2009	N2	Penderyn	Medicine	21	2	2	9.5
18/11/2009	N3	Aman	Medicine	31	3	3	9.7
24/11/2009	P	Anwen	Medicine & Surgery	12	2	2	16.7
24/11/2009	P	Charles Radcliffe	Surgery	24	9	9	37.5
24/11/2009	P	Cystic Fibrosis	Medicine	6	6	6	100
24/11/2009	P	Delyth	Surgery	13	5	5	38.5
24/11/2009	P	E5	Medicine	26	8	8	30.8
24/11/2009	P	E6	Medicine	30	7	7	23.3
24/11/2009	P	E8	Medicine	30	4	4	13.3
24/11/2009	P	East 2	Medicine	33	11	11	33.3
24/11/2009	P	East 7	Medicine	30	6	6	20.0
24/11/2009	P	East One	Medicine	12	6	5	41.7
24/11/2009	P	Gwenwyn	Medicine	6	2	2	33.3
24/11/2009	P	ICU/HDU	Intensive Care	4	2	2	50.0
24/11/2009	P	MAU	Medicine	11	4	4	36.4
24/11/2009	P	W1	Medicine	28	13	13	46.4
24/11/2009	P	W2	Surgery	30	5	5	16.7
24/11/2009	P	W3	Surgery	23	13	13	56.5
24/11/2009	P	W4	Medicine	28	17	17	60.7
24/11/2009	P	W5	Surgery	25	7	7	28.0
24/11/2009	P	West 6	Medicine	32	12	12	37.5
09/12/2009	Q	ASU	Medicine	12	5	5	41.7
09/12/2009	Q	First Floor	Medicine	11	3	3	27.3
09/12/2009	Q	PMW	Medicine	14	2	2	14.3
26/11/2009	R	1	Surgery	24	6	6	25.0
26/11/2009	R	3	Medicine	33	14	14	42.4
26/11/2009	R	4	Medicine	25	9	9	36.0
26/11/2009	R	5	Surgery	26	6	6	23.1
26/11/2009	R	6	Surgery	29	7	7	24.1
26/11/2009	R	9	Medicine	29	7	7	24.1
26/11/2009	R	CCU	Medicine	4	0	0	0.0
26/11/2009	R	CDU	Medicine	10	4	3	30.0
26/11/2009	R	ITU	Intensive Care	5	4	4	80.0
26/11/2009	R	Short Stay Unit	Medicine	15	9	7	46.7
26/11/2009	R	Ty Bryngwyn	Medicine	5	0	0	0.0
16/11/2009	S	2	Surgery	25	2	2	8.0
17/11/2009	S	3	Medicine	10	4	4	40.0
16/11/2009	S	6	Medicine	30	7	7	23.3
16/11/2009	S	7	Medicine	30	3	3	10.0
16/11/2009	S	8	Medicine	32	11	11	34.4
16/11/2009	S	9	Medicine	25	6	6	24.0
16/11/2009	S	10	Medicine	28	10	10	35.7
18/11/2009	S	11/12	Medicine	40	10	10	25.0
17/11/2009	S	4A	Surgery	35	6	6	17.1
16/11/2009	S	4B	Surgery	25	6	6	24.0
16/11/2009	S	CCU	Medicine	7	1	1	14.3
17/11/2009	S	HDU	Intensive Care	3	2	2	66.7
17/11/2009	S	ITU	Intensive Care	2	2	2	100
18/11/2009	T	A	Surgery	12	1	1	8.3
18/11/2009	T	B2	Surgery	15	7	7	46.7
18/11/2009	T	C	Medicine	32	9	9	28.1
18/11/2009	T	CCU	Intensive Care	3	2	2	66.7
18/11/2009	T	D - Medicine	Medicine	24	5	5	20.8
18/11/2009	T	D - Cardiology	Medicine	16	4	4	25.0

Survey	Hospital Code	Ward	Specialty	Patient Number	No. AMx	No. ABx	% ABx
18/11/2009	T	E	Medicine	32	8	7	21.9
18/11/2009	T	HDU	Intensive Care	3	1	1	33.3
18/11/2009	T	MAW	Medicine	17	3	3	17.6
19/11/2009	U	Bedwas	Medicine	12	3	3	25.0
19/11/2009	U	Nantgarw	Medicine	11	5	5	45.5
19/11/2009	U	Nantgarw Extension	Medicine	22	6	6	27.3
19/11/2009	U	Sengheydd	Medicine	31	4	4	12.9
17/12/2009	W	Elizabeth	Medicine	30	7	4	13.3
18/12/2009	W	ORU	Medicine	30	6	4	13.3
2009	Z	All-Wards	All-Specialties	6460	1905	1869	28.9

Key Table 1: No. AMx – number of antimicrobials prescribed; **No. ABx** - number of antibacterials; **%ABx** – proportion of antibacterials prescribed.

Table 2: Gender of patients prescribed antimicrobials

Code	Hospital	Female	% Female	Male	% Male	Total
A	Bronglais Hospital	11	39.3	17	60.7	28
B	Princess of Wales Hospital	47	47.0	53	53.0	100
C	Royal Glamorgan Hospital	37	51.4	34	47.2	72
D	Royal Gwent Hospital	119	61.3	75	38.7	194
E	Morrison Hospital	66	38.4	106	61.6	172
F	University Hospital of Wales	119	46.5	137	53.5	256
G	Withybush Hospital	24	54.5	20	45.5	44
H	Wrexham Maelor Hospital	52	53.6	45	46.4	97
H2	Deeside Community Hospital	1	33.3	2	66.7	3
J	West Wales General Hospital	38	50.0	38	50.0	76
K	Ysbyty Gwynedd	81	50.9	78	49.1	159
L	Ysbyty Glan Clwyd	90	52.6	81	47.4	171
M	Nevill Hall Hospital	47	57.3	35	42.7	82
N	Prince Charles Hospital	52	59.8	35	40.2	87
N2	St Tydfil's Hospital	3	60.0	2	40.0	5
N3	Aberdare Hospital	1	33.3	2	66.7	3
P	Llandough Hospital	87	62.6	52	37.4	139
Q	Velindre Hospital	7	70.0	3	30.0	10
R	Prince Philip Hospital	41	62.1	25	37.9	66
S	Singleton Hospital	41	58.6	29	41.4	70
T	Neath Port Talbot Hospital	26	65.0	14	35.0	40
U	Caerphilly Miners Hospital	13	72.2	5	27.8	18
W	West Wing	7	53.8	6	46.2	13
Z	All-Hospitals	1010	53%	894	47%	1904

Note: The gender of one patient was recorded as unknown (total n=1905).

Table 3: Age groups of patients prescribed antimicrobials

Hospital Code	0-1	2-14	15-29	30-44	45-59	60-74	75+	Unknown	Total
A				3	3	7	15		28
B	5	1	3	3	16	31	41		100
C			1	2	9	22	38		72
D	8	3	15	16	21	52	79		194
E	4	10	5	15	23	55	60		172
F	17	19	19	27	44	47	82	1	256
G				4	3	11	26		44
H			2	5	5	21	64		97
H2					1		2		3
J			4	4	7	20	41		76
K	3	4	6	6	19	40	81		159
L	7	2	9	9	28	54	62		171
M	2	1	6	10	8	20	35		82
N	2	2	1	8	13	26	35		87
N2				1		2	2		5
N3			1	1			1		3
P			8	10	21	28	72		139
Q					1	7	2		10
R			1	2	5	25	33		66
S			1	8	11	20	30		70
T				1	5	13	21		40
U					1	2	15		18
W					1	1	11		13
Z - Numbers	48	42	82	135	245	504	848	1	1905
Z - Proportions	2.5%	2.2%	4.3%	7.1%	12.9%	26.5%	44.5%	0.05%	

Note: Across Wales 44.5% of all patients prescribed antimicrobials were age 75 years and above.

Hospital Codes: **A** - Bronglais; **B** - Princess of Wales; **C** - Royal Glamorgan; **D** - Royal Gwent; **E** - Morriston; **F** - University Hospital of Wales; **G** - Withybush; **H** - Wrexham Maelor ; **H2** - Deeside Community; (**H*** - Wrexham Maelor & Deeside Community hospitals); **J** - West Wales General; **K** - Ysbyty Gwynedd; **L** - Ysbyty Glan Clwyd; **M** - Nevill Hall; **N** - Prince Charles; **N2** - St Tydfil's; **N3** - Aberdare; (**N*** - Prince Charles, St Tydfil's & Aberdare hospitals); **P** - Llandough; **Q** - Velindre; **R** - Prince Philip; **S** - Singleton; **T** - Neath Port Talbot; **U** - Caerphilly Miners; **W** - West Wing; **Z** - All Hospitals.

Table 4: Proportion of Oral/Parenteral prescribing by specialty

Hospital	Medicine		Med/Surgery		ITU		Paediatrics		Surgery	
	O (%)	P (%)	O (%)	P (%)	O (%)	P (%)	O (%)	P (%)	O (%)	P (%)
A	58.6	41.4			60.0	40.0			87.5	12.5
B	56.9	43.1	58.8	41.2	4.3	95.7	50.0	50.0	27.7	72.3
C	62.7	37.3							62.7	37.3
D	63.8	36.2	70.0	30.0	7.1	92.9			51.4	48.6
E	48.6	51.4			34.6	65.4			40.0	60.0
F	70.3	29.7	62.7	37.3	15.7	84.3	31.1	68.9	47.9	52.1
G	62.1	37.9							29.4	70.6
H*	55.5	44.5							9.7	90.3
J	62.5	37.5			10.0	90.0			43.4	56.6
K	57.3	42.7			0.0	100			30.3	69.7
L	63.4	36.6			16.7	83.3	25.0	75.0	53.8	46.2
M	63.0	37.0	41.7	58.3	0.0	100	100	0.0	54.1	45.9
N*	59.0	41.0			0.0	100	0.0	100	46.2	53.8
P	65.5	34.5	66.7	33.3	50.0	50.0			50.9	49.1
Q	23.5	76.5								
R	68.3	31.7			16.7	83.3			34.5	65.5
S	68.4	31.6			25.0	75.0			35.3	64.7
T	26.8	73.2			0.0	100			44.4	55.6
U	65.4	34.6								
W	100	0.0								
Z	61.0%	39.0%	60.2%	39.8%	14.6%	85.4%	30.4%	69.6%	43.7%	56.3%

Key table 4: **O** - oral; **P** - parenteral;

Table 5: Indication for antimicrobial prescription at patient level

Hospital Code	Indication (Proportion %)													
	A	A/B	A/B/D	A/C	A/C/D	A/D	B	B/C	B/D	B/U	C	C/D	D	U
A	50.0						25.0				25.0			
B	54.0	1.0				3.0	29.0				8.0		4.0	1.0
C	52.8			1.4			37.5				2.8		4.2	1.4
D	45.9	1.0		0.5		0.5	39.7				10.3		1.5	
E	49.4	1.2			1.2	1.7	32.6		0.6	0.6	9.9	1.7	1.2	
F	31.3	2.0				3.9	39.8		3.1		8.6		11.3	
G	45.5	2.3				2.3	22.7				22.7	2.3	2.3	
H*	48.0	1.0		1.0			40.0				9.0		1.0	
J	47.4	1.3		1.3		1.3	31.6	2.6			9.2	2.6	2.6	
K	50.9	1.9	0.6	0.6		0.6	20.8	1.3	1.9		15.1		6.3	
L	57.9	2.3				0.6	20.5				11.1		7.6	
M	52.4	2.4					29.3				9.8		6.1	
N*	60.0					2.1	22.1	1.1			13.7		1.1	
P	41.0	1.4		0.7		5.0	30.2		2.9		11.5		6.5	0.7
Q	40.0						60.0							
R	37.9			1.5		4.5	34.8				13.6		7.6	
S	52.9	1.4					35.7		1.4		7.1		1.4	
T	42.5					2.5	32.5				22.5		0.0	
U	44.4	5.6					38.9				5.6		5.6	
W							92.3						7.7	
Z	46.8	1.4	0.1	0.4	0.1	1.8	32.2	0.3	0.9	0.1	10.8	0.3	4.8	0.2

Key Table 5: Indication **A** – community acquired infection; **B** – hospital acquired infection; **C** – surgical prophylaxis; **D** – medical prophylaxis; **U** – unknown indications

Key to Hospital Codes: **A** - Bronglais; **B** - Princess of Wales; **C** - Royal Glamorgan; **D** - Royal Gwent; **E** - Morriston; **F** - University Hospital of Wales; **G** - Wilybush; **H*** - Wrexham Maelor and Deeside Community Hospital; **J** - West Wales General; **K** - Ysbyty Gwynedd; **L** - Ysbyty Glan Clwyd; **M** - Nevill Hall; **N*** - Prince Charles, St Tydfil's and Aberdare hospitals; **P** - Llandough; **Q** - Velindre; **R** - Prince Philip; **S** - Singleton; **T** - Neath Port Talbot; **U** - Caerphilly Miners; **W** - West Wing; **Z** - All Hospitals.

Note: For the majority of hospitals across Wales patients with community acquired infections (indication A) were the predominant group for which an antimicrobial/s was prescribed. However for UHW (**F**), Velindre (**Q**) and West Wing (**W**) patients with hospital acquired infection (Indication B) were the predominant group.

Table 6: Indication for antimicrobial prescription at drug level

2009 PPS data							
Hosp Code	A	B	C	D	U & Mix	Total	Patients
A	24	11	8			43	28
B	85	44	13	8	1	151	100
C	53	39	5	3	2	102	72
D	131	112	24	5		272	194
E	135	82	33	11	1	262	172
F	147	167	27	84		425	256
G	29	14	17	3		63	44
H*	76	53	10	2		141	100
J	58	35	15	5		113	76
K	121	61	33	23		238	159
L	148	51	21	17		237	171
M	65	38	8	7		118	82
N*	76	30	16	3		125	95
P	100	63	20	28	1	212	139
Q	8	9	0			17	10
R	40	34	16	9		99	66
S	50	43	7	3	1	104	70
T	24	18	10	1		53	40
U	13	11	2	1		27	18
W		17	0	1		18	13
All-Hospitals	1383	932	285	214	5	2820	1905
Proportion %	49%	33%	10.1%	7.6%	0.2%		
2008 PPS data							
Hosp Code	A	B	C	D	Unknown	Total	Patients
A						N/A	N/A
B	9	21	4	3		37	26
C	130	60	53	5		248	170
D		7		5		12	10
E	8	21				29	21
F	186	201	55	68	2	512	315
G	45	5	11	1		62	49
H	44	15	2	3	3	67	47
J	85	38	10	2		135	91
K	99	67	19	7	6	198	133
L						N/A	N/A
M*	84	31	20			135	98
N*	106	25	37	5	1	174	115
P	124	73	28	23		248	166
Q	8	10		1		19	13
R	48	27	20	2		97	62
S	39	29	14	3		85	56
T	29	29	6			64	45
U	16	5	3	1		25	22
W		22		1		23	21
All-Hospitals	1103	700	286	132	12	2233	1503
Proportion %	49.4%	31.3%	12.8%	5.9%	0.5%		

Key Table 6: Indication **A** – community acquired infection; **B** – hospital acquired infection; **C** – surgical prophylaxis; **D** – medical prophylaxis; **U&Mix** – unknown and mixed indications; **N/A** – not applicable.

K Key to Hospital Codes: **A** - Bronglais; **B** - Princess of Wales; **C** - Royal Glamorgan; **D** - Royal Gwent; **E** - Morriston; **F** - University Hospital of Wales; **G** - Wwithybush; **H*** - Wrexham Maelor and Deeside Community Hospital; **J** - West Wales General; **K** - Ysbyty Gwynedd; **L** - Ysbyty Glan Clwyd; **M** - Nevill Hall; **N*** - Prince Charles, St Tydfil's and Aberdare hospitals; **P** - Llandough; **Q** - Velindre; **R** - Prince Philip; **S** - Singleton; **T** - Neath Port Talbot; **U** - Caerphilly Miners; **W** - West Wing.

Note: Bronglais hospital (**A**) and Ysbyty Glan Clwyd (**L**) did not take part in the 2008 PPS.

Table 7: Reason for antimicrobial prescription recoded in patient notes

Hospital Code	Indication A			Indication B			Indication C		Indication D		Indication Unknown			All Indications A-D & Unk.		
	Yes	No	Unk.	Yes	No	Unk.	Yes	No	Yes	No	Yes	No	Unk.	Yes	No	Unk.
A	23	1		5	6		1	7						29	14	
B	77	8		43	1		8	5	5	3		1		133	18	
C	40	13		24	15			5	3				2	67	33	2
D	119	12		96	15	1	9	15	4	1				228	43	1
E	125	10		73	7	2	18	15	6	5	1			223	37	2
F	141	6		148	19		15	12	54	30				358	67	
G	23	6		13	1		14	3		3				50	13	
H*	65	11		46	7		1	9	1	1				115	32	
J	52	6		31	4		10	5	5	5				98	15	
K	87	34		55	6		17	16	17	6				176	62	
L	138	10		48	3		10	12	13	4				209	29	
M	60	5		35	3		8	0	3	4				106	12	
N*	65	10	1	24	6		10	6	2	1				108	27	1
P	97	3		58	5		20		25	3		1		200	12	
Q	2	6		9										11	6	
R	38	2		29	5		8	8	4	5				79	20	
S	45	5		42	1		6	1	3					96	7	
T	20	1	3	15	3		4	6	1	1				40	10	3
U	12	1		7	4		2		1					22	5	
W				14	3				1					15	3	
Z	1229	150	4	815	114	3	161	125	148	66	1	2	2	2354	457	9
Proportion	89%	11%	0.3	87%	12%	0.3%	56%	44%	69%	31%	20%	40%	40%	88.9%	10.8%	0.3%

Key Table 7: Indication **A** – community acquired infection; **B** – hospital acquired infection; **C** – surgical prophylaxis; **D** – medical prophylaxis; **Unk.** – Unknown

Key to Hospital Codes: **A** - Bronglais; **B** - Princess of Wales; **C** - Royal Glamorgan; **D** - Royal Gwent; **E** - Morriston; **F** - University Hospital of Wales; **G** - Worthybush; **H*** - Wrexham Maelor and Deeside Community Hospital; **J** - West Wales General; **K** - Ysbyty Gwynedd; **L** - Ysbyty Glan Clwyd; **M** - Nevill Hall; **N*** - Prince Charles, St Tydfil's and Aberdare hospitals; **P** - Llandough; **Q** - Velindre; **R** - Prince Philip; **S** - Singleton; **T** - Neath Port Talbot; **U** - Caerphilly Miners; **W** - West Wing; **Z** - All Hospitals.

Table 8: Top 10 prescribing

Hospital	No of prescriptions of top ten antibacterials												Sum	Top 10 %
	AUG	MET	CXM	CLA	CIP	FLU	AMO	TRI	PIP	VAN				
A	5	4	4	3	3	1	2	7	1	7	1	30	71.4	
B	22	15	12	15	8	7	7	6	10	5	107	70.9		
C	17	11	3	8	11	14	2	3	5	4	78	76.5		
D	64	34	11	24	12	13	9	8	14	13	202	74.3		
E	42	23	20	1	14	16	8	7	12	6	149	58.7		
F	43	43	28	12	37	16	7	16	15	29	246	61.2		
G	5	9	6	2	2	8	5	2	5	2	46	73.0		
H	8	23	7	13	1	7	17	10	9	3	98	69.5		
J	15	16	14	11	3	6	5	11	7		88	79.3		
K	11	30	19	18	21	10	24	6	7	10	156	66.1		
L	7	18	16	16	17	20	27	16	11	11	159	66.8		
M	30	10	1	9	5	7	6	6	9	3	86	73.5		
N*	20	20	17	6	6	5	4	9	5	4	96	76.8		
P	29	22	22	11	12	11	12	14	2	4	139	65.6		
Q	2	1			1		1		1	4	10	58.8		
R	7	12	12	8	1	5	5	7	10	4	71	72.4		
S	17	14	7	7	10	5	2	5	7	1	75	74.3		
T	5	6	9	2	3	5	4	2	2	1	39	75.0		
U	5	2		3	1	4		2	1	2	20	76.9		
W	2	2		1	1			2			8	88.9		
All Hospitals	356	315	208	170	169	160	147	139	133	106	1903	68.7		

Key table 8: **AUG** - co-amoxiclav; **MET** - metronidazole; **CXM** - cefuroxime; **CLA** - clarithromycin; **CIP** - ciprofloxacin; **FLU** - flucloxacillin; **AMO** - amoxicillin; **TRI** - trimethoprim; **PIP** - piperacillin/tazobactam; **VAN** - vancomycin.

Table 9: Number of antibacterials prescribed per patient by indication

Hospital Code	Indication	Number of AB scripts			Proportion of AB scripts		
		1	2	3+	1	2	3+
A	A	7	5	1	53.8	38.4	7.7
	B	3	2	1	75	25	
	C	6	1		100		
A – Total patients	A-C	16	8	2	61.5%	30.8%	7.7%
B	A	31	21	2	57.4	38.9	3.7
	B	17	12	1	56.7	40.0	3.3
	C	3	5		37.5	62.5	
	D	3	3		50.5	50.5	
	Unknown	1			100		
B – Total patients	A-D & Unknown	55	41	3	55.6%	41.4%	3.0%
C	A	24	14	1	61.5	35.9	2.6
	B	17	8	2	63.0	29.6	7.4
	C	1	1		50.0	50.0	
	D	3			100		
	Unknown		1			100	
C – Total patients	A-D & Unknown	45	24	3	62.5%	33.3%	4.2%
D	A	55	22	4	67.9	27.2	4.9
	B	17	4		81.0	19.0	
	C	2	1		66.7	33.3	
D – Total patients	A-C	74	27	4	70.5%	25.7%	3.8%
E	A	52	33	5	57.8	36.7	5.5
	B	38	15	4	66.7	26.3	70.1
	C	14	6		70.0	30.0	
	D	2	1		66.7	33.3	
	Unknown		1			100	
E – Total patients	A-D & Unknown	106	56	9	62.0%	32.7%	5.3%
F	A	40	41	8	44.9	46.1	9.0
	B	62	31	8	61.4	30.7	7.9
	C	17	5		77.3	22.7	
	D	21	6	1	75.0	21.4	3.6
F – Total patients	A-D	140	83	17	58.3%	34.6%	7.1%
G	A	13	8		61.9	38.1	
	B	7	3		70.0	30.0	
	C	5	5	1	45.5	45.5	9.1
	D	1	1		50.0	50.0	
G – Total patients	A-D	26	17	1	59.1%	38.6%	2.3%
H	A	27	15	5	57.4	31.9	10.6
	B	28	9	2	71.8	23.1	5.1
	C	9	1		90.0	10.0	
	D	1			100		
H – Total patients	A-D	65	25	7	67.0%	25.8%	7.2%
H2	A	1		1	50.0		50.0
	B	1			100		
H2 – Total patients	A&B	2		1	66.7%		33.3%
J	A	19	18	2	48.7	46.2	5.1
	B	19	6		76.0	24.0	
	C	4	3	1	50.0	37.5	12.5
	D	1	2		33.3	66.7	
J – Total patients	A-D	43	29	3	57.3%	38.7%	4.0%
K	A	55	27	3	64.7	31.8	3.5
	B	23	7	8	60.5	18.4	21.1
	C	18	7		72.0	28.0	
	D	7	3		70.0	30.0	
K – Total patients	A-D	103	44	11	65.2%	27.8%	7.0%
L	A	62	34	6	60.8	33.3	5.9
	B	25	9		73.5	26.5	
	C	18	1		94.7	5.3	
	D	11	3		78.6	21.4	
L – Total patients	A-D	116	47	6	68.6%	27.8%	3.6%

Hospital	Indication	Number of scripts			Proportion of scripts		
		1	2	3+	1	2	3+
	A	28	14	3	62.2	31.1	6.7
	B	14	7	2	60.9	30.4	8.7
	C	8			100		
	D	3	2		60.0	40.0	
M – Total patients	A-D	53	23	5	65.4%	28.4%	6.2%
N	A	40	18		69.0	31.0	
	B	9	5		64.3	35.7	
	C	11	3		78.6	21.4	
	D		1			100	
N – Total patients	A-D	60	27		69.0%	31.0%	
N2	B	3	1		75	25	
N2 – Total patients	B	3	1		75.0%	25.0%	
N3	B	1	2		33.3	66.7	
N3 – Total patients	B	1	2		33.3%	66.7%	
P	A	37	21	6	57.8	32.8	9.4
	B	31	11	2	70.5	25.0	4.5
	C	13	3		81.3	18.7	
	D	9	1	2	75.0	8.3	16.7
	Unknown	1			100		
P – Total patients	A-D & Unknown	91	36	10	66.4%	26.3%	7.3%
Q	A	2	2		50.0	50.0	
	B	4	2		66.7	33.3	
Q – Total patients	A&B	6	10		60.0%	40.0%	
R	A	16	11		59.3	40.7	
	B	14	9		60.9	39.1	
	C	4	6		40.0	60.0	
	D	3			100		
R – Total patients	A-D	37	26		58.7%	41.3%	
S	A	26	11	1	68.4	28.9	2.6
	B	19	3	3	76.0	12.0	12.0
	C	3	2		60.0	40.0	
	D	1	1		50.0	50.0	
S – Total patients	A-D	49	17	4	70.0%	24.3%	5.7%
T	A	12	4	1	70.6	23.5	5.9
	B	7	5		58.3	41.7	
	C	8	1		88.9	11.1	
	D		1			100	
T – Total patients	A-D	27	11	1	69.2%	28.2%	2.6%
U	A	5	3		62.5	37.5	
	B	6	2		75.0	25.0	
	C		1			100	
	D	1			100		
U – Total patients	A-D	12	6		66.7%	33.3%	
W	B	6	1		85.7	14.3	
	D	1			100		
W – Total patients	B&D	7	1		87.5%	12.5%	
Z - All patients	All A-D & Unknown	1192	585	92	63.8%	31.3%	4.9%

Key table 9: A – community acquired infection; B – hospital acquired infection; C – surgical prophylaxis; D – medical prophylaxis; 1 – monotherapy; 2 – two antibacterials prescribed per patient; 3+ - three or more antibacterials prescribed per patient.

Key to Hospital Codes: A - Bronglais; B - Princess of Wales; C - Royal Glamorgan; D - Royal Gwent; E - Morriston; F - University Hospital of Wales; G - Wyllybush; H* - Wrexham Maelor and Deeside Community Hospital; J - West Wales General; K - Ysbyty Gwynedd; L - Ysbyty Glan Clwyd; M - Nevill Hall; N* - Prince Charles, St Tydfil's and Aberdare hospitals; P - Llandough; Q - Velindre; R - Prince Philip; S - Singleton; T - Neath Port Talbot; U - Caerphilly Miners; W - West Wing; Z - All Hospitals.

Note: Antifungals & antivirals are not included in the data set.

Table 10: Dosing regimens for treatment of CA-RTI

Hospital Code	Route:	Oral				Parenteral	
	Dose	0.375g	0.625g	0.625g	0.6g	0.6g	1.2g
	Dose per day	3	2	3	2	3	3
A	Co-amoxiclav	2					
B	Co-amoxiclav			7	1	1	3
C	Co-amoxiclav			8			3
D	Co-amoxiclav			5		2	5
E	Co-amoxiclav			5			2
F	Co-amoxiclav		1	9	1		3
G	Co-amoxiclav			1			1
H	Co-amoxiclav						1
J	Co-amoxiclav			3			3
L	Co-amoxiclav			1			
M	Co-amoxiclav			5			5
N	Co-amoxiclav			6		1	3
P	Co-amoxiclav			9			5
Q	Co-amoxiclav					1	
R	Co-amoxiclav			1			3
S	Co-amoxiclav			4			2
T	Co-amoxiclav			1			
U	Co-amoxiclav						3 (1 = BD)
All Hospitals	Co-amoxiclav	2	1	65	2	5	42
Hospital Code	Route:	Oral				Parenteral	
	Dose	0.125g	0.25g	0.5g	1g	0.5g	1g
	Dose per day	3	3	3	3	3	3
A	Amoxicillin		1				
B	Amoxicillin			4			
D	Amoxicillin			5	1		
E	Amoxicillin	1		3			
F	Amoxicillin	1		1			
G	Amoxicillin			1	4		
H	Amoxicillin			9		1	2 (1 =2g)
J	Amoxicillin			3			
K	Amoxicillin			7	6		4
L	Amoxicillin	1		15			
M	Amoxicillin			2	1		
N	Amoxicillin			1			
P	Amoxicillin			8			
R	Amoxicillin			1			
S	Amoxicillin		1				
T	Amoxicillin			1			
All Hospitals	Amoxicillin	3	2	61	12	1	6
Hospital	Route:	Oral				Parenteral	
	Dose	0.125g	0.25g	0.5g		0.25g	0.5g
	Dose per day	2	2	3		2	2
A	Clarithromycin			2		1	
B	Clarithromycin	1		7			4
C	Clarithromycin			6			
D	Clarithromycin			9			1
E	Clarithromycin			1			
F	Clarithromycin		1	7			1
G	Clarithromycin			2			
H	Clarithromycin			8			2
J	Clarithromycin			5			1
K	Clarithromycin			9			4
L	Clarithromycin		5	6			1
M	Clarithromycin			5			1
N	Clarithromycin			1			
P	Clarithromycin		1	7			1
R	Clarithromycin			6			
S	Clarithromycin		1	3			
T	Clarithromycin			1			1
U	Clarithromycin			2			1
All Hospitals	Clarithromycin	1	8	87		1	18

Hospital Code	Route	Oral		Parenteral
	Dose	0.1	0.1	0.1
	Dose per day	1	2	1
C	Doxycycline	5	1	
D	Doxycycline	1		
E	Doxycycline	10	2	1
H	Doxycycline	1		
L	Doxycycline	1		
M	Doxycycline	1		
N	Doxycycline	3	1	
S	Doxycycline	3		
All Hospitals	Doxycycline	25	4	1

Key Table 10: A - Bronglais; B - Princess of Wales; C - Royal Glamorgan; D - Royal Gwent; E - Morriston; F - University Hospital of Wales; G - Wwithybush; H - Wrexham Maelor; J - West Wales General; K - Ysbyty Gwynedd; L - Ysbyty Glan Clwyd; M - Nevill Hall; N - Prince Charles; P - Llandough; Q - Velindre; R - Prince Philip; S - Singleton; T - Neath Port Talbot; U - Caerphilly Miners.

Table 11: Antibacterials prescribed for hospital acquired infection

Antibacterials	CNS	CVS	ENT	EYE	GI	GUOB	MIX	N.D.	RESP	SSTBJ	UTI	Total
Metronidazole			2		87	4		8	16	19	1	137
Co-amoxiclav		1	1		5	5	1	8	39	20	15	95
Vancomycin		3		1	48		1	18	7	5		83
Piperacillin/Tazo		1			4			13	47	7	2	74
Flucloxacillin			1			1	1	2	1	56		62
Trimethoprim										3	51	54
Ciprofloxacin			1		4			3	15	7	22	52
Meropenem					5		2	8	17	9	3	44
Clarithromycin									33	2		35
Amoxicillin					1				11	4	8	24
Gentamicin	2	4	2		4			5	5	1		23
Cefuroxime					5			2	10	5	1	23
Teicoplanin	1		1					3	5	10		20
Cefotaxime	2				3			6	7	1	1	20
Cefalexin		1			1	1				5	8	16
Doxycycline									8	5	1	14
Fusidic acid	1							4		9		14
Rifampicin		1			1			3		8		13
Benzyloxyphenoxymethyl penicillin					1			3		8		12
Imipenem/Cilastatin					3			2	4	1	1	11
Cefradine						3			2	2	1	8
Erythromycin									1	6		7
Nitrofurantoin											7	7
Penicillin V			1							3		4
Ceftriaxone				1					2	1		4
Linezolid					2			1		1		4
Amikacin								1	1	1		3
Clindamycin								2		1		3
Ceftazidime									2			2
Levofloxacin									2			2
Azithromycin									1			1
Cefaclor					1							1
Ertapenem											1	1
Mupirocin										1		1
Tetracycline										1		1
Co-trimoxazole					1							1
Grand Total	6	11	9	2	176	14	5	92	236	202	123	876

Key Table 11: CNS - Central nervous system; CVS - Cardiovascular system; ENT - Ear, nose, throat, mouth or larynx; EYE - Eye; GI - Gastrointestinal tract including liver and biliary tree; GUOB - Genitourinary tract; MIX - more than one diagnosis; N.D. - No clear anatomical site (Not Defined); RESP - Respiratory tract; SSTBJ - Skin, soft tissue, bone and joint; UTI - Urinary tract

Table 12: Antibacterials by indication B1-B5

Antibacterials	B1	B2	B3	B4	B5	Total
Metronidazole	34	4	62	32	5	137
Co-amoxiclav	38	3		45	9	95
Vancomycin	10	7	44	20	2	83
Piperacillin/Tazobactam	11	15		46	2	74
Flucloxacillin	37	7		14	4	62
Trimethoprim	7	5		40	2	54
Ciprofloxacin	13	8		29	2	52
Meropenem	17	11		15	1	44
Clarithromycin	10	1		21	3	35
Amoxicillin	6			15	3	24
Cefuroxime	9			14		23
Gentamicin	3	4		14	2	23
Cefotaxime	1	6		11	2	20
Teicoplanin	9	2		8	1	20
Cefalexin	7	1		6	2	16
Doxycycline	3	3		8		14
Fusidic acid	9	1		3	1	14
Rifampicin	6	2	1	3	1	13
Benzympenicillin	4	1		5	2	12
Imipenem/Cilastatin	5	1		5		11
Cefradine	7			1		8
Erythromycin	4	1		2		7
Nitrofurantoin		1		6		7
Ceftriaxone		1		3		4
Linezolid	1	3				4
Penicillin V	2	1		1		4
Amikacin		1		2		3
Clindamycin		1		2		3
Ceftazidime				1	1	2
Levofloxacin				2		2
Azithromycin				1		1
Cefaclor	1					1
Ertapenem				1		1
Mupirocin				1		1
Tetracycline	1					1
Co-trimoxazole	1					1
Grand Total	256	91	107	377	45	876

Key Table 12: B1 – Post-operative infection; B2 – Other intervention related infections; B3 – *C. difficile* associated diarrhoea; B4 – Other hospital acquired infection; B5 – Infection present on admission from another hospital

Table 13: Dosing regimens for treatment of HA-RTI

Hospital Code	Route Dose per day	Oral			Parenteral	
		0.375g	0.625g	0.625g	1.2g	1.2g
A	Co-amoxiclav	3	2	3	2	3
B	Co-amoxiclav	1				1
C	Co-amoxiclav			2		
D	Co-amoxiclav	1		4		5
E	Co-amoxiclav			1		1
F	Co-amoxiclav		1	5		3
J	Co-amoxiclav			2		1
M	Co-amoxiclav				1	1
N	Co-amoxiclav					2
P	Co-amoxiclav			1		
R	Co-amoxiclav			1		
S	Co-amoxiclav			2		
W	Co-amoxiclav			1		
All Hospitals	Co-amoxiclav	2	1	21	1	14

Table 14: Surgical prophylaxis by diagnosis code and duration of treatment C1, C2 & C3

Hospital Code	Diagnosis Code	Indication	Total Number Prescriptions	Number C3	Proportion C3 > 1 day
A	Proph GI	C3	4		100
	Proph GyOb	C3	1		100
	Proph UT	C3	3		100
A Total			8	8	100%
B	Proph GI	C2	2		
		C3	9		81.8
	Proph SBJ	C2	1		
		C3	1		50.0
B Total		13	10	76.9%	
C	Proph CVS	C1	2		
	Proph GI	C1	2		
	Proph SBJ	C2	1		
C Total		5	0	0.0%	
D	Proph ENT	C3	3		100
		C1	3		
		C1	1		
	Proph GyOb	C2	1		
		C1	4		
		C2	6		
	Proph SBJ	C3	3		23.1
		C1	2		
		C3	1		33.3
D Total		24	7	29.2%	
E	Proph CNS	C2	1		
		C2	5		
	Proph CVS	C3	1		16.7
		C2	1		
	Proph ENT	C3	8		100
		C1	1		
	Proph RES	C3	1		50.0
		C1	1		
	Proph SBJ	C2	2		
		C3	5		62.5
C3		3		100	
E Total		29	18	62.1%	
F	Proph CVS	C1	1		
		C3	7		87.5
	Proph GI	C1	2		
		C3	5		71.4
	Proph RES	C3	1		100
	Proph SBJ	C2	7		
	Proph UT	C1	3		
C2		1			
F Total		27	13	48.1%	
G	Proph CVS	C1	2		
		C1	1		
	Proph GyOb	C1	1		
		C2	1		
	Proph SBJ	C1	6		
		C2	5		
C3		1		8.3	
G Total		17	1	5.9%	

Hospital Code	Diagnosis Code	Indication	Total Number Prescriptions	Number C3	Proportion C3 > 1 day
H	Proph GyOb	C1	4		
	Proph SBJ	C2	2		
		C3	2		50.0
	Proph UT	C1	2		
H Total		10	2	20%	
J	Proph CVS	C3	1		100
	Proph ENT	C3	2		100
	Proph GI	C2	1		
		C3	5		83.3
	Proph RES	C3	2		100
	Proph SBJ	C3	1		100
	Proph UT	C3	3		100
J Total		15	14	93.3%	
K	Proph ENT	C3	1		100
	Proph GI	C1	3		
		C3	10		76.9
	Proph SBJ	C2	16		
	Proph UT	C1	3		
K Total		33	11	33.3%	
L	Proph CVS	C2	1		
	Proph GI	C1	5		
	Proph GyOb	C1	4		
		C2	1		
		C3	1		16.7
	Proph SBJ	C1	1		
		C2	5		
	Proph UT	C3	1		14.3
C3		2		100	
L Total		21	4	19%	
M	Proph GI	C3	3		100
	Proph GyOb	C2	1		
		C3	3		75.0
	Proph SBJ	C3	1		100
M Total		8	7	87.5%	
N	Proph GI	C3	4		100
	Proph GyOb	C2	2		
	Proph SBJ	C2	7		
		C3	2		22.2
	Proph UT	C3	1		100
N Total		16	7	43.8%	
P	Proph GI	C3	2		100
	Proph GyOb	C1	3		
	Proph SBJ	C2	12		
		C3	2		11.8
	Proph UT	C1	1		
P Total		20	4	20%	
R	Proph CVS	C3	2		100
	Proph GI	C3	4		100
	Proph SBJ	C1	6		
		C2	2		
		C3	1		11.1
	Proph UT	C3	1		100
R Total		16	8	50%	

Hospital Code	Diagnosis Code	Indication	Total Number Prescriptions	Number C3	Proportion C3 > 1 day
S	Proph ENT	C3	2		100
	Proph GI	C1	1		
		C3	2		66.6
	MIX	C3	2		100
S Total			7	6	85.7%
T	Proph SBJ	C1	1		
		C2	5		
		C3	3		33.3
T Total			9	3	33.3%
U	Proph GI	C2	2		
U Total			2	0	0.0%
Total	All diagnosis		280	123	43.9%

Table 15: Surgical prophylaxis by antibacterial, hospital & duration of treatment C1, C2 & C3

Antibacterial	Hospital Code	C1	C2	C3	Total Scripts	% C3 2009 PPS	% C3 2008 PPS	
Cefuroxime	B		2	1	3	33.3		
	C	1	1		2	0	0	
	D	1	6		7	0	37.5	
	E		5	2	7	28.6		
	F		6	5	11	45.5	76.5	
	G		1	1	2	50.0	14.3	
	H		2	2	4	50.0		
	J		1	4	5	80.0	66.7	
	K	1	16	1	18	5.6	40.0	
	L	6	6	1	13	7.7		
	M			1	1	100	28.6	
	N			5	3	8	37.5	0
	P			10	3	13	7.7	0
	R	1	2	3	6	50.0	28.6	
	S	1		3	4	75.0	66.7	
	T	1	5		6	0	100	
Cefuroxime Total		12	68	30	110	27.3%	37.0%	
Co-amoxiclav	A			1	1	100		
	B			1	1	100		
	D	4	1	3	8	37.5	66.7	
	E	1	4	5	10	50.0		
	F	2	1	1	4	25.0	80.0	
	G	2			2	0	50.0	
	H	4			4	0		
	J			1	1	100		
	K	1		1	2	50.0	10033	
	L	1		1	2	50.0		
	M		1	5	6	83.3	0	
	N		2		2	0	20.0	
	P	3			3	0	60.0	
	U		1		1	0	0	
Co-amoxiclav Total		18	10	19	47	40.4%	55.3%	

Note: Table 15 continues on next page

Antibacterial	Hospital Code	C1	C2	C3	Total Scripts	% C3 2009 PPS	% C3 2008 PPS
Gentamicin	D	4		1	5	20.0	0
	F	2			2	0	0
	G	5			5	0	
	H	2			2	0	0
	K	3			3	0	0
	P	1			1	0	0
	R	4			4	0	0
Gentamicin Total		21		1	22	4.5%	5.9%
Metronidazole	A			1	1	100	
	B		1	5	6	83.3	
	C	2			2	0	0
	E			1	1	100	
	F			1	1	100	100
	G	1			1	0	100
	J			3	3	100	100
	K	1		5	6	83.3	66.7
	L	1			1	0	
	N			2	2	100	80.0
	P			1	1	100	0
	R			3	3	100	50.0
	S			3	3	100	66.7
	T			1	1	100	
	U		1		1	0	
Metronidazole Total		5	2	26	33	78.8%	65.9%
Grand Total		56	80	76	212	35.8 %	41.2 %

Key to Hospital Codes: A - Bronglais; B - Princess of Wales; C - Royal Glamorgan; D - Royal Gwent; E - Morriston; F - University Hospital of Wales; G - Wwithybush; H - Wrexham Maelor ; J - West Wales General; K - Ysbyty Gwynedd; L - Ysbyty Glan Clwyd; M - Nevill Hall; N - Prince Charles; P - Llandough; Q - Velindre; R - Prince Philip; S - Singleton; T - Neath Port Talbot; U - Caerphilly Miners.

GLOSSARY

Indications

A	Community Acquired Infection
B	Hospital Acquired Infection <ul style="list-style-type: none">▪ B1 – Post-operative infection▪ B2 – Other intervention related infections▪ B3 – <i>C. difficile</i> associated diarrhoea▪ B4 – Other hospital acquired infection▪ B5 – Infection present on admission from another hospital
C	Surgical Prophylaxis <ul style="list-style-type: none">▪ C1 – Single dose▪ C2 – 1 day▪ C3 – > 1 day
D	Medical Prophylaxis

Diagnosis Groups

CNS	Central nervous system
CVS	Cardiovascular system
EYE	Eye
ENT	Ear, nose, throat, mouth or larynx
GI	Gastrointestinal tract including liver and biliary tree
GUOB	Genitourinary tract
N.D.	No clear anatomical site
Not Defined	No clear anatomical site
RESP	Respiratory tract
SSTBJ	Skin, soft tissue, bone and joint
UTI	Urinary tract
MIX	More than one diagnosis group e.g. RESP & UTI.

Diagnosis Codes

CNS/CNS	Infections of the Central Nervous System
CNS/Proph CNS	Prophylactic use for CNS
CVS/CVS	Cardiovascular infections: endocarditis, vascular graft
CVS/Proph CVS	Cardiac or vascular surgery, endocarditis prophylaxis
EYE/EYE	Endophthalmitis
EYE/Proph Eye	Prophylaxis for eye operations
ENT/ENT	Infections of ear, mouth, nose, throat or larynx
ENT/Proph ENT	Prophylaxis for Ear, Nose or Throat (surgery or medical)
GI/GI	GI infections (salmonellosis, antibiotic associated diarrhoea)
GI/IA	Intra-abdominal sepsis including hepatobiliary
GI/Proph GI	Surgery of the GI tract, liver or biliary tree, GI prophylaxis in Neutropenic patients or hepatic failure
GUOB/GUM	Prostatitis, epididymo-orchitis, STD in men
GUOB/OBGY	Obstetric or gynaecological infections, STD in women
GUOB/Proph GyOb	Prophylaxis for obstetric or gynaecological surgery
Not Defined/BAC	Bacteraemia (not endocarditis) with no clear anatomical site
Not Defined/SIRS	Systemic inflammatory response with no clear anatomic site
Not Defined/UND	Completely un-defined site with no systemic inflammation

RESP/Bron	Acute bronchitis, exacerbations of chronic bronchitis, COPD or COAD, and any other respiratory tract infections other than pneumonia
RESP/Pneu	Pneumonia
RESP/Proph RES	Pulmonary surgery, prophylaxis for respiratory pathogens
SSTBJ/SST	Cellulitis, wound, deep soft tissue not involving bone
SSTBJ/BJ	Septic arthritis (including prosthetic joint), osteomyelitis
SSTBJ/Proph SBJ	Prophylaxis for plastic or orthopaedic surgery (bone or joint)
UTI/Cys	Lower UTI
UTI/Pye	Upper UTI
UTI/Proph UT	Prophylaxis for urological surgery, recurrent UTI

General Acronyms

ATC	Anatomical Therapeutic Chemical (ATC) classification
BD	Twice a day
CA	Community Acquired
CAI	Community Acquired Infection
CAP	Community Acquired Pneumonia
CDAD	Clostridium difficile-associated disease
CF	Cystic Fibrosis
CI	Confidence Interval (95% CI)
HA	Hospital Acquired
HAI	Hospital Acquired Infection
ICU	Intensive Care Unit
O	Oral
OD	Once a day
P	Parenteral
PPS	Point Prevalence Survey
QDS	Four times a day
Med	Medicine
RTI	Respiratory Tract Infection
SCBU	Special Care Baby Unit
SSBJI	Skin, Soft issue, Bone & Joint Infections
T	Topical
TDS	Three times a day
UTI	Urinary Tract Infection

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