



# **National Point Prevalence Survey of Healthcare Associated Infections, Device usage and Antimicrobial use in Long-Term Care Facilities 2017**

## **HALT-3**



## **Wales**

### **HCAI and AMR Programme**

The Healthcare Associated Infection and Antimicrobial Resistance Programme can be accessed via the Public Health Wales website:  
<http://www.publichealthwales.wales.nhs.uk/>

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## Glossary

|                 |   |
|-----------------|---|
| <b>AMR</b>      | Antimicrobial resistance                                      |
| <b>CI</b>       | Confidence intervals  |
| <b>CRI</b>      | Catheter related infection                                    |
| <b>CVS</b>      | Cardiovascular system   |
| <b>ECDC</b>     | European Centre for Disease Prevention and Control            |
| <b>EU</b>       | European Union  |
| <b>GI</b>       | Gastrointestinal infection                                    |
| <b>HAI</b>      | Healthcare associated infection                               |
| <b>HALT</b>     | Healthcare associated infections in long-term care facilities |
| <b>IP&amp;C</b> | Infection prevention and control                              |
| <b>LRT</b>      | Lower respiratory tract                                       |
| <b>LTCF</b>     | Long term care facility                                       |
| <b>MDRO</b>     | Multi-drug resistant organism                                 |
| <b>NHS</b>      | National Health Service                                       |
| <b>PHW</b>      | Public Health Wales   |
| <b>PPS</b>      | Point prevalence survey                                       |
| <b>RTI</b>      | Respiratory tract infection                                   |
| <b>SSI</b>      | Surgical site infection                                       |
| <b>UK</b>       | United Kingdom  |
| <b>UTI</b>      | Urinary tract infection                                       |
| <b>WHO</b>      | World Health Organisation                                     |
| <b>WTE</b>      | Whole time equivalent   |
| <b>WG</b>       | Welsh Government  |

## Executive Summary

|  |
|--|
| <p><b>Survey characteristics and population in Welsh LTCFs 2017</b></p> <ul style="list-style-type: none"> <li>• A total 1050 residents from 30 long-term care facilities (LTCFS) were included in the 2017 HALT survey. The size of participating LTCFs ranged from 15 to 64 available beds (median of 37).</li> <li>• Residents over 85 years of age accounted for 51% of residents and 71% of residents were female.</li> </ul>   |
| <p><b>Risk factors for infection in Wales 2017</b></p> <ul style="list-style-type: none"> <li>• Risk factors collected for each resident included: over 85 in age, non-ambulant, disorientation, incontinence, presence of a urinary / vascular catheter, pressure sores, other wounds or recent surgery</li> <li>• A total of 69.4% were non-ambulant; 69% were disorientated in time and/or space and 73.1% were incontinent of urine and/or faeces. A total of 4.2% of residents had a pressure ulcer.</li> </ul>   |
| <p><b>Characteristics of HAI in Welsh LTCFs 2017</b></p> <ul style="list-style-type: none"> <li>• A total of 63 HAIs were reported with a prevalence of 6%. The prevalence ranged from 0% to 20% within LTCFs. The most common infections reported included RTI (46%), UTI (39.7%) and skin / soft tissue (9.5%). These results were similar to those reported in the 2013 HALT survey.</li> <li>• A total 97% RTI were lower respiratory. The RTI were mainly attributed to females (72.4%) and residents over the age of 85 (31%). Over 93% were prescribed antibiotics for treatment.</li> <li>• Approximately 40% of reported HAI were UTIs. Only 52% were confirmed cases with lack of microbiological evidence of infection for all others identified. Antibiotics were prescribed for confirmed and probable UTIs.</li> <li>• UTIs were attributed mainly to female residents (68%) and to residents over the age of 85 (48%).</li> <li>• A urinary catheter was present in 20% of residents identified with a UTI.</li> <li>• Urine dipsticks were mainly performed on advice of the GP to confirm a suspected UTI.</li> </ul> |
| <p><b>Device usage in LTCFs in Wales 2017</b></p> <ul style="list-style-type: none"> <li>• A total of 79 residents had a urinary catheter in situ giving an overall prevalence of 7.5%.The prevalence ranged from 0% to 23.3% within LTCFs.</li> <li>• Although prevalence has increased since the 2013 survey (5.4%), this was not significant.</li> </ul>  |
| <p><b>Antimicrobial usage in LTCFs in Wales 2017</b></p> <ul style="list-style-type: none"> <li>• A total of 107 residents in LTCFs were prescribed one or more antimicrobials at the time of the survey, giving an overall prevalence of 10.2% (compared with 7.5% in 2013).</li> <li>• A total of 13 different antimicrobials were prescribed during the survey with approximately 59% and 41% prescribed for treatment and medical prophylaxis, respectively.</li> <li>• <b>Antimicrobials for treatment of infection:</b> The most common reason for treatment was for an RTI (lower RTI) (approx. 42%). Amoxicillin was the commonest antimicrobial prescribed (63%). Treatment of UTIs accounted for 23% of all prescriptions. Trimethoprim was the commonest antimicrobial prescribed (60%).</li> <li>• <b>Antimicrobials for prevention of infection:</b> Approximately 97% of antimicrobial prescribed were for the prevention of UTI with trimethoprim the top antimicrobial.</li> </ul>   |
| <p><b>Infection prevention and control practice / antimicrobial policy and guidelines</b></p> <ul style="list-style-type: none"> <li>• In-house IP&amp;C training was only evident for nursing staff.</li> <li>• Hand hygiene sessions were organised at the majority of care homes but audits on staff practices were not evident.</li> <li>• An established programme of surveillance for IP&amp;C was identified in only 43% of LTCFs.</li> <li>• Antimicrobial prescribing guidelines, training and surveillance were not evident in the majority of LTCFs.</li> </ul>   |
| <p><b>Quality improvement priorities recommended</b></p> <ul style="list-style-type: none"> <li>• Implement interventions to reduce the burden of RTIs</li> <li>• Implement multimodal interventions to reduce the burden of UTIs</li> <li>• Review the resources required to prevent infections and antimicrobial resistance with a particular focus on the need to address prevention and management in the community / LTCFs</li> <li>• Provide improved access to up-to-date policies and guidelines that are applicable</li> <li>• Improve support and education within LTCFs around antimicrobial prescribing guidance and IP&amp;C policy and guidelines for the prevention or reduction of infection</li> </ul>  |

## 1. Introduction

Prevention and control of healthcare-associated infections (HAIs) and antimicrobial resistance (AMR) in long-term care facilities (LTCFs) are of high priority for the National Health Service (NHS) and Public Health Wales (PHW). HAIs and AMR are a serious public health risk, particularly in light of Wales' ageing population. There were estimated to be 634,637 people aged 65 years and over living in Wales in 2016<sup>1</sup>. There are approximately 1,081 LTCFs across Wales, which equates to over 25,000 residents who are living full-time in a LTCF<sup>2</sup>.

For elderly residents living in care homes, the onset of infection represents the most common cause of hospital admission and death. The vulnerable and elderly population are already more susceptible to infection due to chronic health problems and as a consequence their ability to fight infection is reduced<sup>3</sup>. The most frequent endemic infections include urinary tract infections (UTI), respiratory tract infections (RTI) and skin and soft tissue infections<sup>3</sup>. A significant proportion of HAIs are preventable, and therefore can be a valuable marker of quality of resident care<sup>4</sup>. Previous research within care homes has found that antibiotics are often over-prescribed, increasing the development of antibiotic resistant infections in this susceptible group. Point prevalence studies (PPS) in care homes show a high use of antibiotics, especially to treat UTIs<sup>5</sup>. Furthermore, antibiotics are frequently prescribed without the presence of infection.

Healthcare Associated Infections in Long Term Care Facilities (HALT) is a project supported by the European Centre for Disease Prevention and Control (ECDC)<sup>6,7</sup>. The project provides methodology for continued assessment of the prevalence of HAIs, antimicrobial use, infection prevention and control resources and antimicrobial activity in European LTCFs. Since 2010, other than the ECDC PPS in LTCFs across Europe (including Wales), data within the UK remains limited. Results from HALT (2010) estimated that at least 2.6 million HAIs occur each year in LTCFs in Europe<sup>6</sup>. Many LTCFs do not have their own surveillance programmes or feedback mechanisms in place to their general practitioner practices in respect of HAIs, antimicrobial prescribing or AMR.

Care home settings provide the opportunity for spread of infection in a population where vulnerable groups live together in close proximity, sharing care equipment and facilities, increasing the risk of cross contamination. The profile of residents is also changing in relation to healthcare processes. There is an increase in the level of care required for residents, because of earlier discharge from acute care hospitals<sup>3</sup>. For these reasons infection prevention and control is a continuing challenge within the care home setting.

Between October and November 2017, Wales participated in the HALT-3 PPS of HAI, device usage and antimicrobial use. The Welsh Government supported PHW to coordinate the survey. The results from this survey will provide an opportunity for PHW to review the current epidemiology of HAI and antimicrobial prescribing patterns and share findings with the participating LTCFs in Wales. Results from this survey will also inform advice to Welsh Government and Health Boards / Trusts on key priority areas of work around infection reduction, antimicrobial stewardship and quality improvement interventions required to reduce AMR and infections within LTCFs.



## Aims and objectives

To conduct a PPS within a sample of LTCFs in Wales and report findings at a Wales level and with specific reports to LTCFs taking part. Specific objectives of the HALT-3 survey are to:

- Determine the HAI prevalence as well as the type of infections causing the greatest burden of disease within nursing / care homes
- Determine the prevalence of device usage and estimate device related infections
- Measure antimicrobial prescribing and report on types of antimicrobials prescribed
- Evaluate the current support network and surveillance programmes for LTCFs in relation to IP&C and antimicrobial prescribing
- Identify areas for intervention, training and/or additional IP&C support, both at local and all-Wales level to enhance the safety of healthcare for residents in LTCFs and the ageing Welsh population in general
- Contribute to ECDC-EU-wide prevalence survey results for 2016 / 2017

## 2. Methods

### Study design

The HALT-3 PPS was undertaken in Welsh LTCFs across North and South Wales between October 2017 and November 2017. Convenience sampling was used for recruitment of LTCFs to the survey with voluntary participation by LTCFs. The survey protocol in Wales was developed by PHW using the ECDC protocol for PPS for LTCFs<sup>6</sup> with some minor adaptations to antimicrobial data, in line with the all-Wales Primary Care antibiotic guidelines<sup>8</sup>. Members of the HAI / AMR team, PHW, collected the data. Each LTCF surveyed was completed within one day.

Data capture in Wales was via an Excel spreadsheet developed locally to capture ECDC required data fields. Specific data was requested for all residents and further information was required for residents on a course of systemic antimicrobial(s) and/or presenting signs or symptoms of an active HAI on the day of the PPS. In addition, the LTCF manager was requested to complete an institutional questionnaire during the visit. The latter was to measure structure and process indicators of IP&C and antimicrobial prescribing<sup>6</sup>.

Any suspected infections could be confirmed by meeting ECDC case definitions of infections (*Annex 4, ECDC HALT-3 technical document V2.1, pp. 45-50*)<sup>6</sup> or by using the electronic infection checker developed by Baxter (ICNet)<sup>9</sup>, also following ECDC definitions of infections. This allowed for greater consistency on infection data across Wales.

Data was extracted from a number of sources available within each LTCF at the time of the survey. These included nursing and medical notes, observation charts, prescription charts, laboratory reports (microbiology results) and resident care plans. A significant amount of data was collected by verbal communications with LTCF managers and other LTCF staff, and in some cases, residents themselves, with verbal consent, on the day of the survey.

Further details on the study design can be found in the ECDC HALT-3 protocol<sup>6</sup>.

### Training and support

The ECDC HALT-3 team delivered a total of six webinars across Europe during January 2017 and February 2017, to provide support and guidance for participating countries and to familiarise co-coordinators with the updated protocol and associated questionnaires<sup>6</sup>.

In-house training for data collectors was provided by the PHW lead coordinator within HCAI / AMR team by means of a power point presentation and regular meetings during 2017.

## Inclusion and exclusion criteria

### Eligibility criteria for LTCFs

Due to time constraints for conducting the survey across Wales, it was agreed to aim for a minimum of 25 LTCFs with a minimum of 15 residents and maximum of 60 residents per home. This ensured each LTCF could be completed in half a day.

All types of LTCFs were eligible to participate, including:

- General nursing homes
- Residential homes
- Specialised LTCFs
- Mixed LTCFs

LTCFs meeting the criteria above and those who participated in previous HALT surveys (2010/2013) were invited to participate initially. Participating LTCFs were situated within a number of different Health Boards across Wales with approximately 50% split between North and South Wales.

### Eligible residents

All residents who lived full-time (24 hours a day) in the LTCF and were present at 08:00 AM on the day of the survey were included.

## Data collection and management

### Data collection

An information sheet was provided to LTCF Managers outlining HALT-3, its objectives, and what would be expected on the day of the survey and signed consent was obtained prior to the survey. A total of 30 LTCFs were recruited.

Data were collected using a locally designed spreadsheet with built-in drop down menus with all specific data requirements. Data on resident demographics, the presence of intrinsic and extrinsic risk factors, antimicrobial prescriptions and the presence of an infection were collected (as shown below):

*Care home level:*

- General data (ownership, type of rooms, qualified nurse-presence)
- Total number of available and occupied beds,

*Resident level (all):*

- General data (sex, birth year)
- Possible risk factors (urinary catheter, vascular catheter, pressure sores, wounds, incontinence, disorientation, mobility status, surgery in the last 30 days)
- Signs/symptoms of infection, residents on antimicrobials

*Resident level (those on antimicrobials and / or infection signs and symptoms):*

- Length of stay at the care home (less or more than 1 year)
- Admission to hospital in the last 3 months
- Antimicrobial data (name, start date of treatment, daily dosage, administration route, indications, sample taken, microorganism isolated, prescribed by whom)
- Signs and symptoms of infection based on HALT protocol criteria<sup>6</sup> and using an infection checker utilised for the ECDC PPS on HAI, device usage and AMR<sup>9,10</sup>.

Specific questions on coordination of medical care, infection control structure and provision, antibiotic Policy were also collected.

## Data analysis

Data was managed and analysed using STATA 14.1 and Microsoft Excel 2007 was used to produce tables and charts. The prevalence of HAIs, antimicrobials and devices was reported as the number of patients with one or more HAIs (or antimicrobials or devices) per 100 patients surveyed. Prevalence of individual HAI types, antimicrobial drugs or device types were also reported per 100 patients and 95% Wilson confidence intervals (CIs) were calculated. Data were compared in the latest survey (2017) with the 2013 PPS where applicable.

### 3. Results

#### Survey Characteristics

A total of 1,050 residents from 30 LTCFs were included in the survey. The size of participating LTCFs ranged from 15 to 64 available beds with a median of 37. The total number of LTCFs, beds and residents included in the 2017 HALT-3 PPS are described in Table 1.

**Table 1** Number LTCFs and residents surveyed and total number of single rooms available, October/November 2017

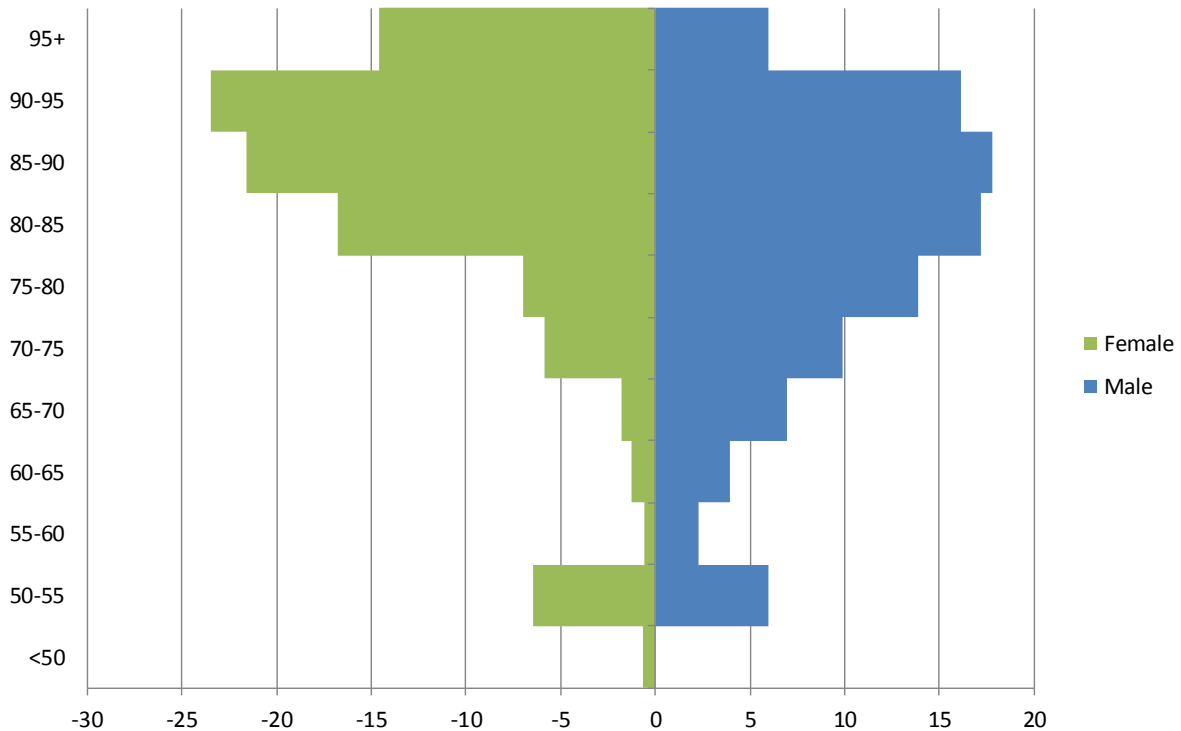
| No. LTCFs | Total Resident rooms | Total single occupancy resident rooms | Total rooms with en-suite facilities | Total Residents |
|-----------|----------------------|---------------------------------------|--------------------------------------|-----------------|
| <b>30</b> | 1121                 | 1093                                  | 851                                  | <b>1,050</b>    |

The overall proportion of single rooms within the LTCFs surveyed was 98%. Of these single rooms 78% provided either en-suite or personal washing facilities within the room.

#### Survey population and risk factors

##### Survey population

From the data supplied on 1,050 residents, 50.6% were over 85 years, ranging from 26 to 104 years, with a median age of 86 years. The proportion of residents aged 85 and over within LTCFs has decreased significantly ( $p < 0.05$ ) compared to 2013. It is important to note that one LTCF surveyed was for younger residents and the age range within this facility was 27-75 years with a median age of 60. This may have contributed to the decrease in residents in the over 85 year's category. A total of 71% of residents were female and accounted for a larger proportion of residents over the age of 85 years. The age and sex distribution of the LTCF resident population for the 2017 survey is shown in Figure 1.

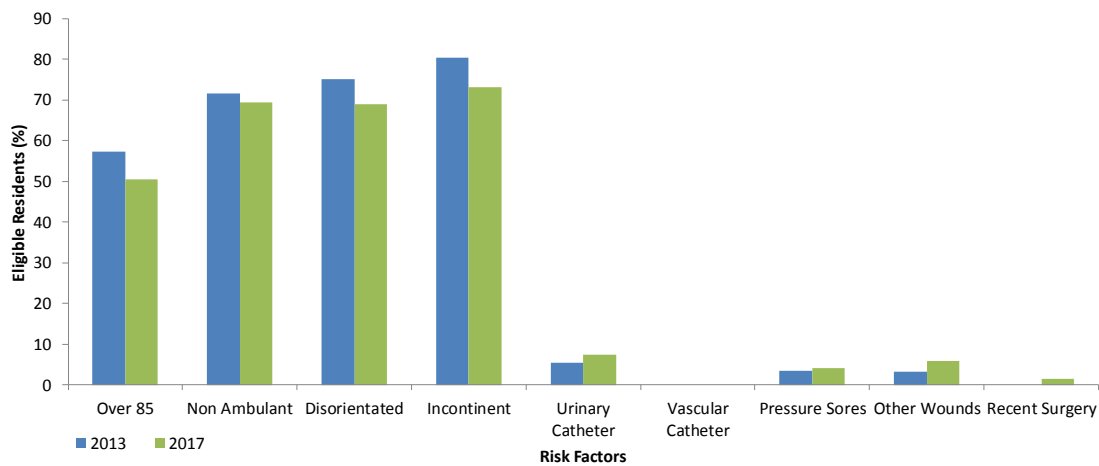


**Figure 1** Population pyramid for the LTCF resident population

## Risk factors

Risk factors collected for each resident included age (over 85 years), non-ambulant, disorientation, incontinence, presence of a urinary / vascular catheter, pressure sores, other wounds or recent surgery. Over 50% of residents were over 85 years in age. A total of 69.4% were non-ambulant; 69% were disorientated in time and/or space and 73.1% were incontinent of urine and/or faeces. A total of 4.2% of eligible residents in the 2017 survey were identified with a pressure ulcer, compared to 3.4% in 2013 survey. A total of 5.8% of eligible residents were identified to have a wound (other) compared to 3.2% in 2013 survey and significantly less having recent surgery ( $p < 0.05$ ). Comparisons should be interpreted with caution due to low numbers.

Figure 2 provides detail on the prevalence of risk factors noted above and comparison with 2013 data. The tabulated data provides additional information on the confidence intervals around the prevalence for each risk factor. The graph allows for easier comparison between 2013 and 2017 data.



| Prevalence of risk factors | Eligible residents (%) |                  |
|----------------------------|------------------------|------------------|
|                            | 2013                   | 2017             |
| Over 85                    | 57.4 (55.4-59.4)       | 50.6 (47.6-53.6) |
| Non Ambulant               | 71.7 (69.8-73.5)       | 69.4 (66.6-72.1) |
| Disorientated              | 75.1 (73.3-76.8)       | 69.0 (66.1-71.7) |
| Incontinent                | 80.4 (78.7-82.0)       | 73.1 (70.4-75.7) |
| Urinary Catheter           | 5.4 (4.5-6.4)          | 7.5 (6.1-9.3)    |
| Vascular Catheter          | 0 (0.0-0.2)            | 0.0 (0-0.4)      |
| Pressure Sores             | 3.4 (2.7-4.2)          | 4.2 (3.1-5.6)    |
| Other Wounds               | 3.2 (2.6-4.0)          | 5.8 (4.6-7.4)    |
| Recent Surgery             | 0 (0-0.2)              | 1.5 (0.9-2.5)    |

**Figure 2** Resident risk factors: comparison between HALT-2 (2013) and HALT-3 (2017) resident data

There were significantly fewer residents who were disorientated or incontinent during the 2017 survey ( $p < 0.05$ ). This may be partly due to only 80% of homes having a qualified nurse present 24 hours a day during the 2017 survey for provision of more specialised care. The latter would be provided in a nursing home as opposed to a care home where such qualified nurses are not present.

# Healthcare associated infections within long-term care facilities (LTCF) in Wales

## Prevalence of HAI in LTCFs 2017



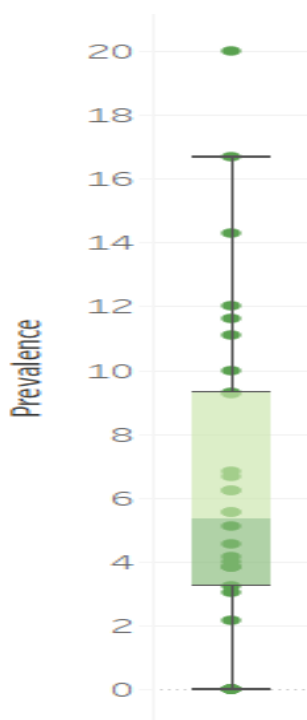
Approximately 1 in 17 residents had a HAI

A total of 63 residents in LTCFs had at least one HAI at the time of the survey. The overall prevalence was 6.0% (95% CI: 4.7-7.6). The HAI prevalence in 2017 was significantly higher ( $p < 0.05$ ) than in 2013 (3.8%) (Table 2)

**Table 2** Prevalence of HAI in 2017 and 2013 (Wales) in LTCFs

| LTCF      | No. residents | No. residents with HAI | HAI prevalence (%)      | 2013 HALT-2: HAI prevalence (%) |
|-----------|---------------|------------------------|-------------------------|---------------------------------|
| All LTCFs | <b>1050</b>   | <b>63</b>              | <b>6.0</b><br>(4.7-7.6) | <b>3.8%</b><br>(3.1-4.6)        |

The prevalence of infection by LTCF ranged from 0% to 20%.



A total of 63 HAIs were reported during the 2017 survey. A box plot is shown in Figure 3, which details the distribution of infection prevalence by LTCF. Each dot represents a LTCF. The upper and lower lines represent data within 1.5 times the inter-quartile range. Any dots outside of the box plot show that a LTCF is an outlier. One LTCF was an outlier.

The median infection prevalence was 5.3% to take into consideration the outlier.

**Figure 3** Distribution of infection prevalence by LTCF in Wales 2017

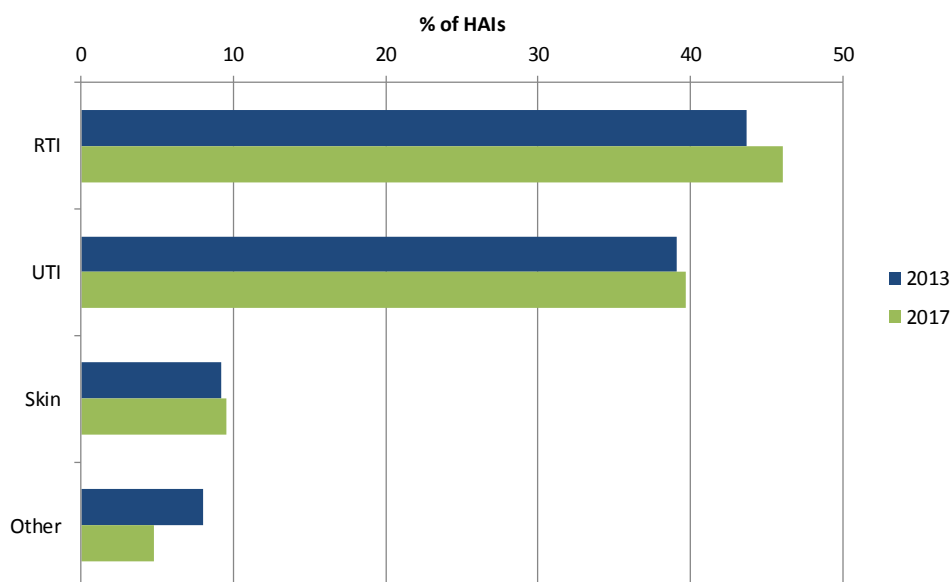


## Characteristics of HAI occurring in LTCFs 2017

The most common HAIs reported in the 2017 survey were respiratory tract infection (RTI) (46.0%), and urinary tract infections (UTI) (39.7%). This was similar to the 2013 survey, where the highest reported HAI type was RTI (43.7%), with UTIs the second highest accounting for 39.1% of infections. There was no significant difference between reported HAIs for RTI and UTI in 2017 compared to 2013 ( $p>0.05$ ). Table 3 details the number, percentage and prevalence of HAI by infection type for 2017. Figure 5 shows the distribution of HAI types in LTCFs in 2017 compared with 2013. All HAIs identified (100%) were attributable to the LTCF in 2017. Comparable data for 2013 is unavailable.

**Table 3** Number and prevalence of HAIs by infection site in LTCFs (Wales 2017)

| Infection site   | No. infections | % of HAIs  | Prevalence (%) | 95% CI           |
|------------------|----------------|------------|----------------|------------------|
| RTI              | 29             | 46.0       | 2.8            | 1.9 – 3.9        |
| UTI              | 25             | 39.7       | 2.4            | 1.6 – 3.5        |
| Skin/soft tissue | 6              | 9.5        | 0.6            | 0.3 – 1.2        |
| Other            | 3              | 4.8        | 0.3            | 0.1 – 0.8        |
| <b>Total</b>     | <b>63</b>      | <b>100</b> | <b>6.0</b>     | <b>4.7 – 7.6</b> |



**Figure 5** Distribution of HAI types in LTCFs for 2017 in comparison to previous survey in 2013.

## Detail on the top two infections within LTCFs in Wales 2017

### Respiratory tract infection (RTI)

A total of 29 out of 63 (46%) reported HAIs were identified as RTI. Almost all of RTIs were related to lower respiratory tract infections (97%) and one related to common cold syndrome/pharyngitis. The infections were mainly attributed to female residents (72.4%). Over 31% of all RTI were in residents over 85 years old and 64.3% had been a resident at the LTCF for longer than 1 year. Over 93% of residents (27 of 29 residents) with RTIs were prescribed antimicrobials for treatment. Only 40% of LTCFs had therapeutic guidelines in place for RTIs.

### Urinary tract infection (UTI)

Approximately 40% (25 out of 63) of reported HAIs were identified as UTI. However, only 52% were recorded as 'confirmed' infections with 48% noted as 'probable' infection following ECDC case definition for UTI. Confirmed UTIs required signs and symptoms of infection present and a urine culture confirmed as positive. Probable UTIs included signs and symptoms present with no urine culture taken, or results were negative or unknown. It is important to note that the data collectors saw only two microbiology reports confirming an infection. Other 'confirmed' reports were recorded in resident notes or confirmed verbally to PHW data collectors (as positive results from the GP). UTIs were attributed mainly to female residents (68%). A total 48% of UTIs were in residents over 85 years of age and 45.8% had been a resident at the LTCF for longer than 1 year. A urinary catheter was present in 5 out of 25 (20%) of residents identified with UTI.

From the institutional questionnaire completed 50% of LTCFs performed urine dipstick routinely for diagnosing a UTI, 43% sometimes and 7% never. Over 50% of LTCFs confirmed that they had therapeutic guidelines in place for UTIs.

### Microbiology results available in LTCFs

Microbiology results were available at the time of survey for only two out of the 63 HAIs identified (3.2%). The microorganisms recorded were *Escherichia coli* (UTI) and *Staphylococcus aureus* (skin infection).

## Prevalence of urinary catheter usage within LTCFs in Wales 2017



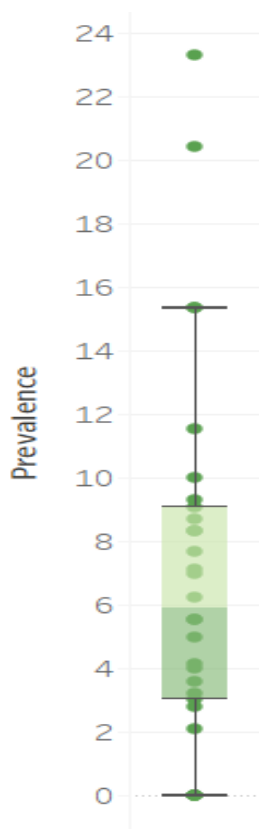
Approximately 1 in 13 residents had a urinary catheter in situ

A total of 79 residents in LTCFs had a urinary catheter in situ at the time of the survey. The overall prevalence was 7.5% (95% CI: 6.1-9.3). There was an increase in the use of urinary catheters compared to 2013 (Table 4) but this was not significant ( $p > 0.05$ ).

**Table 4** Prevalence of urinary catheter within LTCFs in Wales 2017

| No. patients with urinary catheter | 2017<br>(Residents=1050) |         | 2013<br>(Residents=2302) |         |
|------------------------------------|--------------------------|---------|--------------------------|---------|
|                                    | Prevalence (%)           | 95% CI  | Prevalence (%)           | 95% CI  |
| 79                                 | 7.5                      | 6.1-9.3 | 5.4                      | 4.5-6.4 |

The prevalence of urinary catheters ranged from 0% - 23.3% within LTCFs.



A total of 79 patients were reported to have a urinary catheter in place during the 2017 survey. Figure 6 is a box plot, which shows the distribution of urinary catheter prevalence by LTCF. Any dots outside of the box plot show that a LTCF is an outlier when considering the urinary catheter prevalence for the survey. Two LTCFs were outliers.

The median prevalence was 5.9% to take into account outliers.

A urinary catheter was present in 5 out of 25 (20.0%) of residents identified with UTI.

**Figure 6** Distribution of urinary catheter prevalence by LTCF

# Antimicrobial usage in LTCFs in Wales 2017

## Prevalence of antimicrobial prescribing in LTCFs 2017



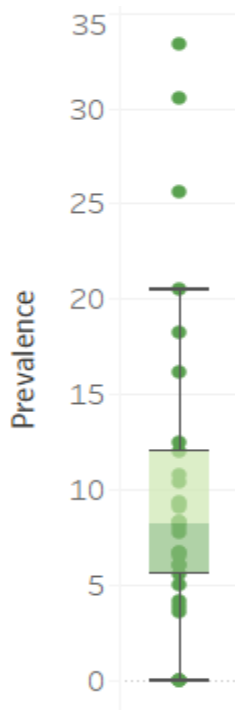
Approximately 1 in 10 residents were taking antimicrobials

A total of 107 residents in LTCFs were prescribed one or more antimicrobials at the time of the survey. The overall prevalence was 10.2% (95% CI: 8.5- 12.2). (Table 5) This was higher than 2013 but not significantly ( $p>0.05$ ).

**Table 5** Prevalence of antimicrobial usage in Wales 2017 in LTCFs

| LTCF type | No. residents | No. residents on AMs | Prevalence (%) | 95% CI     | 2013 HALT-2: AM prevalence (%) |
|-----------|---------------|----------------------|----------------|------------|--------------------------------|
| All LTCFs | 1050          | 107                  | 10.2           | (8.5-12.2) | 7.5 (6.5-8.6)                  |

The prevalence of antimicrobial prescribing by LTCF ranged from 0% to 33.3%.

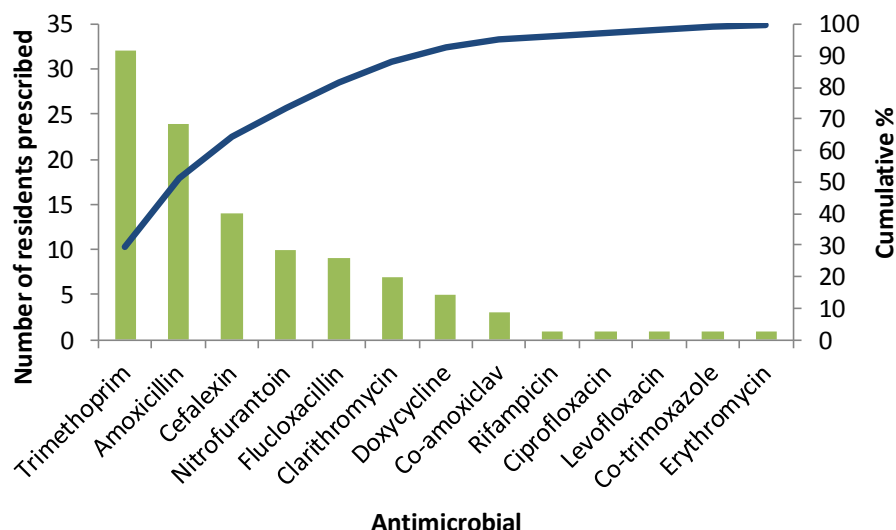


A total of 107 residents within LTCFs in Wales (2017) were prescribed one or more antimicrobials during the survey. Figure 7 is a box plot, which shows the distribution of antimicrobial prevalence by LTCF. Any dots outside of the box plot show that a LTCF is an outlier when considering the antimicrobial prevalence for the survey. Three LTCFs were outliers.

The median antimicrobial prevalence was 8.2% to take into consideration outliers.

**Figure 7** Distribution of antimicrobial prevalence by LTCF

A total of 109 antimicrobials were prescribed at the time of the survey with 98% residents receiving one antimicrobial. A direct comparison cannot be made between the 2017 and 2013 data, as there were differences in the number of antimicrobials that could be recorded between both surveys. Details of the prescribed antimicrobials (including treatment and prophylaxis) is noted in Figure 8. The most commonly prescribed antimicrobial was trimethoprim (29.4%) followed by amoxicillin (22.0%) and cefalexin (12.8%). Trimethoprim and amoxicillin accounted for approximately 51% of all antimicrobials prescribed.



**Figure 8** Number and cumulative percentage of antimicrobials prescribed for the treatment and prophylaxis of infection

## Characteristics of antimicrobials prescribed in LTCFs in Wales 2017

A total of 13 different antimicrobials were prescribed during the 2017 HALT-3 survey in Wales. The number and percentage of prescriptions by indication is described in Table 6. Approximately 59% of antibiotics prescribed were for the treatment of infections and 41% for medical prophylaxis.

### Antimicrobials for treatment in LTCFs 2017

A total of 64 antimicrobials were prescribed for the treatment of infection in LTCFs in Wales. The most common reason for treatment of infection was for RTI accounting for approximately 42% of antimicrobials being prescribed. RTI included lower respiratory tract infections (97%), bronchitis, common cold and pharyngitis (1%).

Treatment of UTI with antimicrobials accounted for approximately 23% of all prescriptions. Table 6 provides detail of the antimicrobials prescribed for treatment of RTI, UTI and skin infections.

**Table 6** *Most frequently prescribed therapeutic antimicrobials in relation to respiratory tract, urinary tract and skin and soft tissue infection, for LTCFs in Wales 2017*

| <b>Residents on antimicrobial therapy for RTI</b>            | <b>Therapeutic number (%)</b> |
|--|-------------------------------|
| Amoxicillin  | 17 (63.0)                     |
| Clarithromycin   | 6 (22.2)                      |
| Doxycycline  | 3 (11.1)                      |
| Co-amoxiclav   | 1 (3.7)                       |
| <b>Residents on antimicrobial therapy for UTI</b>            | <b>Therapeutic %</b>          |
| Trimethoprim   | 15 (60.0)                     |
| Amoxicillin  | 4 (16.0)                      |
| Nitrofurantoin   | 3 (12.0)                      |
| Cefalexin  | 2 (8.0)                       |
| Ciprofloxacin  | 1 (4.0)                       |
| <b>Residents on antimicrobial therapy for skin infection</b> | <b>Therapeutic %</b>          |
| Flucloxacillin   | 5 (62.5)                      |
| Clarithromycin   | 1 (12.5)                      |
| Amoxicillin  | 1 (12.5)                      |
| Doxycycline  | 1 (12.5)                      |

Amoxicillin was the commonest antimicrobial prescribed for the treatment of RTIs. Trimethoprim was the commonest antimicrobial prescribed for a UTI.

## Antimicrobials for prevention of infection

### Medical prophylaxis

Approximately 41.3% of antimicrobials were prescribed for medical prophylaxis. Table 7 identifies the top three antimicrobials prescribed for medical prophylaxis, which equates to 80% of total prophylactic antibiotics prescribed. Of the 36 top three prophylactic antibiotics prescribed, 35 (97.2%) were for UTI prevention. In the 2013 HALT-2 survey in Wales, 35.7% of total antimicrobials prescribed was for prophylactic use with 90.8% of total prophylactic antimicrobials prescribed for UTI prevention. Trimethoprim was the commonest antimicrobial prescribed for prophylaxis (37.8%). Data for the top three prophylactic antibiotics prescribed in HALT-2 (2013) is unavailable and therefore it is not possible to compare with data in Table 7.

**Table 7** Top 3 antimicrobials for medical prophylaxis in LTCFs

| Antimicrobial  | Number | %    |
|----------------|--------|------|
| Trimethoprim   | 17     | 37.8 |
| Cefalexin      | 12     | 26.7 |
| Nitrofurantoin | 7      | 15.6 |
| Total of top 3 | 36     | 80.0 |

## Use of antimicrobials associated with an increased risk of *Clostridium difficile* infection in LTCFs in Wales

A total of 6 broad spectrum antimicrobials associated with an increased risk of *Clostridium difficile* infection were prescribed during the 2017 HALT-3 survey of LTCFs in Wales. The antimicrobials prescribed (number and percentage) are described in Table 8.

No residents were identified with *Clostridium difficile* infection during the HALT-3 survey, compared to 1 resident in the 2013 survey. Data were based on a small sample size, however recommendations can be made. Antibiotics should only be prescribed when there is available clinical evidence of bacterial infection<sup>11</sup>. Restricted broad spectrum antibiotics should only be used when indicated by the residents' clinical condition in conjunction with causative organisms. The HALT-3 survey identified only two microbiology results available out of 64 infections being treated with antibiotics. Conclusions drawn include recommending that simple guidelines on indications for using broad-spectrum antibiotics should be available<sup>11</sup>. Only 3 LTCFs (10%) had antimicrobial guidelines available. Only 3 LTCFs (10%) had a system in place to remind staff of the importance of microbiological samples to inform the best antimicrobial choice. No system was in place requiring permission from a designated person for prescribing restricted antimicrobials not included within the formulary, and a therapeutic formulary was only available in 2 (6.7%) of the LTCFs.

**Table 8** Distribution of broad spectrum antimicrobials associated with an increased risk of *C. difficile* in LTCFs in Wales (2017)

| Antimicrobial group                                  | Antimicrobial | No. of antimicrobials | % of antimicrobials |
|--|---------------|-----------------------|---------------------|
| Penicillins, combinations inc. B-lactamase inhibitor | Co-amoxiclav  | 3                     | 2.8                 |
| Fluoroquinolones                                     | Ciprofloxacin | 1                     | 0.9                 |
|  | Levofloxacin  | 1                     | 0.9                 |
|  | Fleroxacin    | 0                     | 0                   |
|  | Moxifloxacin  | 0                     | 0                   |
| Cephalosporins (1st gen)                             | Cefalexin     | 14                    | 12.8                |
| Total  |               | 19                    | 17.4                |

NB: There were no antimicrobials prescribed under the antimicrobial groups Lincosamides, Cephalosporins (2nd gen) and Cephalosporins (3rd gen)

## Institutional Questionnaire

### Medical and Nursing Care and co-ordination

Each participating LTCF provided information on medical and nursing care coordination via the 'Institutional Questionnaire'<sup>6</sup>.

A total 80% of participating LTCFs reported 24 hour presence of a qualified nurse. Medical resident care was provided by residents' personal General Practitioner (GP) or group practices for 29 out of 30 (96.7%) LTCFs. Not all physicians or nursing staff could consult medical / clinical records of all residents in the facility. Table 9 provides a summary of responses provided.

**Table 9** Medical and nursing care coordination within LTCFs (n=30)

| Medical Care coordination  | Number (%)                                   |
|--|--|
| Medical resident care, including antimicrobial prescribing is provided by: <ul style="list-style-type: none"> <li>Personal GP or group practice only</li> <li>Both personal GP/group practice and medical doctor employed by facility</li> </ul>   | 29 (96.7)<br>1 (3.3)                         |
| Medical activities coordinated by coordinating medical physician: <ul style="list-style-type: none"> <li>No internal or external coordination of medical activity</li> <li>Yes- physician inside facility</li> <li>Yes- physician outside the facility</li> <li>Yes- physician both inside and outside the facility</li> </ul> | 11 (36.7)<br>1 (3.3)<br>17 (56.7)<br>1 (3.3) |
| The physician can consult medical/clinical records of all residents in the facility  | 21 (70.0)                                    |
| The nursing staff can consult medical/clinical records of all residents in the facility  | 24 (80.0)                                    |

*NB: ECDC definition of a 'coordinating medical physician' is a medical doctor in charge of the coordination of medical activities and standardization of practices/policies in the facility*

### Infection Prevention and Control Practice

For the purpose of HALT-3 the definition of an IP&C practitioner was a registered nurse or medical practitioner with allocated time to support the reduction of HAIs.

A total 26 of 30 LTCFs (86.7%) had a dedicated IP&C practitioner with responsibility for IP&C activities, surveillance and training. Only 6 out of 30 LTCFs (20.0%) participated in regular IP&C committee meetings. All LTCFs noted that they provided IP&C training for nursing staff with only 13.3% providing IP&C training for GPs and medical staff. Further details of IP&C activities and LTCF participation is shown in Table 10. Of interest, 28 out of 30 (93.3%) LTCFs offered their residents annual influenza immunization, the majority had written protocols for the management of relevant devices. There was a lack of surveillance conducted in the homes.



**Table 10** Description of infection prevention and control activities in participating LTCFs (n=30)

| <b>Infection Prevention and Control Activities</b>   | <b>Number (%)</b> |
|--|-------------------|
| Infection prevention training of nursing staff   | 30 (100.0)        |
| Infection prevention training of GPs and medical staff   | 4 (13.3)          |
| Development of care protocols  | 21 (70.0)         |
| Register for residents colonised/infected with a multi-drug resistant organism                       | 8 (26.7)          |
| Designated person responsible for management and reporting of outbreaks                              | 26 (86.7)         |
| Feedback on IP&C surveillance results to the nursing / medical staff                                 | 12 (40.0)         |
| Supervision of disinfection and sterilization of medical and care material                           | 12 (40.0)         |
| Decision on isolation & additional precautions for residents colonized with resistant microorganisms | 17 (56.6)         |
| Offer of annual immunization for flu to all residents  | 28 (93.3)         |
| Organization, control, feedback on hand hygiene in LTCF  | 22 (73.3)         |
| <b>Written protocols within LTFC</b>   |                   |
| MRSA management  | 28 (93.3)         |
| Hand hygiene   | 30 (100.0)        |
| Management of urinary catheters  | 26 (86.7)         |
| Management of venous catheters/lines   | 9 (30.0)          |
| Management of enteral feeding  | 24 (80.0)         |
| <b>Programme of surveillance for HAI established</b>   |                   |
| Yes  | 13 (43.3)         |
| No   | 17 (56.7)         |
| Hand hygiene training session organised in last 12 months  |                   |
| Yes  | 24 (80.0)         |
| No   | 6 (20.0)          |

## Antimicrobial Policy

Each participating LTCF provided information on antimicrobial prescribing, policy, surveillance and feedback via the 'Institutional Questionnaire'<sup>6</sup> Table 11 provides a summary of responses provided. Highlighted areas identify the lowest response (3% or less) received. In general, antimicrobial prescribing guidelines, training and surveillance were not evident at the majority of the LTCFs surveyed.

**Table 11** Description of antimicrobial policy in participating LTCFs in Wales (n=30)

| Antimicrobial policy activities  | Number (%) |
|--|------------|
| LTCF has 'restrictive' list of antimicrobials to be prescribed:  | 2 (6.7)    |
| • Carbapenems  | 0          |
| • 3 <sup>rd</sup> generation cephalosporins  | 0          |
| • Fluoroquinolones   | 0          |
| • Vancomycin   | 0          |
| • Mupirocin  | 0          |
| • Glycopeptides  | 0          |
| • Broad-spectrum antibiotics   | 1          |
| • Intravenously administered antibiotics   | 1          |
| Antimicrobial committee  | 0 (0.0)    |
| Annual regular training on appropriate antimicrobial prescribing   | 0 (0.0)    |
| Written guidelines for appropriate antimicrobial use (good practice)   | 3 (10.0)   |
| Data available on annual antimicrobial consumption by antimicrobial class  | 1 (3.3)    |
| System to remind staff of importance of microbiological samples to inform the best antimicrobial choice                                    | 3 (10.0)   |
| Local antimicrobial resistance profile summaries available in LTCF or in local GP surgeries  | 3 (10.0)   |
| A system that requires permission from a designated person(s) for prescribing of restricted antimicrobial, not included in local formulary | 0 (0.0)    |
| Advice from pharmacist for antimicrobials not included in the formulary  | 6 (20.0)   |
| A therapeutic formulary, comprising a list of antibiotics  | 2 (6.7)    |
| Feedback to the local GP on antimicrobial consumption in the facility  | 1 (3.3)    |
| Written therapeutic guidelines available in LTCF on respiratory tract infections   | 12 (40.0)  |
| Written therapeutic guidelines available in LTCF on urinary tract infections   | 16 (53.3)  |
| Written therapeutic guidelines available in LTCF on wound and soft tissue infections   | 15 (50.0)  |
| Programme for surveillance of antimicrobial consumption and feedback in place in LTCF  | 4 (13.3)   |
| Programme for surveillance of resistant microorganisms in place in LTCF ( <i>annual report for MRSA, Clostridium difficile, etc</i> )      | 8 (26.7)   |

## 4. Discussion

The aims and objectives of the 2017 HALT survey in Wales were set out below:

- Determine the HAI prevalence as well as the type of infections causing the greatest burden of disease within nursing / care homes
- Determine the prevalence of device usage and estimate device related infections
- Measure antimicrobial prescribing and report on types of antimicrobials prescribed
- Evaluate the current support network and surveillance programmes for LTCFs in relation to IP&C and antimicrobial prescribing
- Identify areas for intervention, training and/or additional IP&C support, both at local and all-Wales level to enhance the safety of healthcare for residents in LTCFs and the ageing Welsh population in general
- Contribute to ECDC-EU-wide prevalence survey results for 2016 / 2017

The findings of the 2017 HALT-3 survey indicate a HAI prevalence of 6%, showing a burden equivalent to one in every seventeen residents with an infection associated with a care home setting. The prevalence of antimicrobial prescribing was 10.2%, equivalent to one in every ten residents being prescribed antimicrobials. RTI was the highest reported infection accounting for 46% of reported infections. UTI was the second highest reported accounting for approximately 40% of reported infections and skin / soft tissue accounted for almost 10% of infections. Approximately 7.5% of residents had a urinary catheter in situ during the 2017 survey.

Where data was equivalent, HALT-3 results (2017) were compared with HALT-2 survey results (2013). The HAI prevalence in 2017 was higher (6.0%) than in 2013 (3.8%). The prevalence of antimicrobial prescribing in LTCFs has increased since 2011 (7.9% 2011 compared with 10.2% 2017), however not significantly. The infection types and their ranking was similar in both the 2013 and 2017 survey. The percentage of residents with a urinary catheter in situ has increased since 2011 (5.4%, 2011 compared with 7.5% 2017) although not significantly.

Direct comparison of data between both surveys should be treated with caution. The number of residents in the 2017 survey was less than half (1,050) when compared to residents surveyed in 2013 (2,302). In addition to a smaller sample size, two LTCFs within the 2017 survey were outliers for both HAI and AMR prevalence. The combination of sample size and outliers would certainly skew the prevalence reported. The median HAI and AMR prevalence is considered a better representation of the Wales data for the 2017 survey. The median HAI prevalence was 5.4% and AMR prevalence was 9.1%. The timing of the 2013 and 2017 survey differed. The 2017 PPS was conducted during the autumn/winter months of October and November, compared with April / May in 2013. The potential season-related increase in HAIs during the winter period should be considered, particularly relating to respiratory illness<sup>12</sup>.

## The prevalence of HAIs within LTCFs in Wales

A total 46% of HAIs were identified as RTI during the 2017 survey with the majority noted as lower respiratory tract. Over 93% were prescribed antibiotic treatment for the infections. Similar findings were noted during the Wales ECDC PPS, where pneumonia was the most common HAI with two-thirds community onset<sup>10</sup>. There is a need to prioritise interventions to reduce lower RTI in care homes. For example, oral care has been associated with good evidence of benefit<sup>13</sup>. In addition care homes should be aware and follow guidelines to reduce influenza and influenza-like illnesses to reduce respiratory infection burden<sup>14, 15</sup>. Over 90% of the LTCFs surveyed offered annual influenza vaccines to residents. Staff vaccination rates was not gathered during this survey.

Although almost 40% of infections were identified as UTI only half were 'confirmed' infections with fifty percent 'probable' by definition. Confirmed UTIs required signs and symptoms of infection present and urine culture confirmed as positive (e.g. acute confusion / deteriorating in cognitive function, fever, pain / tenderness alongside a dipstick). 'Probable' infections include signs and symptoms with negative cultures or where a culture may not have been taken. Within the survey the majority of confirmed infections were either recorded in the notes or confirmed verbally by the LTCF manager. The lack of positive microbiology did not however prevent the prescribing of antibiotics. Interestingly dipsticks were only performed when a UTI was suspected. This was on recommendation from local GP practices. There was not a strong association between the presence of a urinary catheter and a UTI (20% rate). Many of the UTIs noted were attributed to females and in residents over the age of 85. This concurs with results from the Welsh ECDC PPS (2017)<sup>10</sup>. In the same report two thirds of UTIs were associated with the community and *Escherichia coli* as the commonest microorganism<sup>10</sup>. There is more urgency to reduce the burden of UTI now due to the increasing antimicrobial resistance being seen in urinary isolates. There is a requirement to implement multimodal interventions to reduce the burden of infection, especially with focus in the community and prescribing within primary care. Interventional work will continue in Wales. Prevention standards known as the 'UTI-9' is currently been developed in Wales. The standards include prevention, diagnosis, treatment and monitoring strategies such as hydration initiatives, urine sampling and appropriate prescribing of antimicrobials. The standard will provide appropriate information for use within the community.

## The prevalence of antimicrobial prescribing in LTCFs in Wales

Approximately 59% of antimicrobials prescribed were for the treatment of infections (mainly lower RTI and UTI) and over 40% as medical prophylaxis. The latter has increased since the 2013 survey by over 6%. Amoxicillin was the most common antibiotic prescribed for the treatment of an RTI. Trimethoprim was the commonest antibiotic prescribed for the treatment of and prevention of UTIs. There is evidence to suggest that the use of trimethoprim increases bacterial

resistance and Public Health England have produced infection guidelines to switch from trimethoprim to nitrofurantoin as empiric treatment for UTI<sup>16, 17</sup>. Similar guidelines have been proposed in Wales and will be available in the future. In addition, long term prescribing of such prophylactic antibiotics become ineffective against infection prevention and leads to build-up of resistance. Beech (2016) has introduced a patient centred approach to improve the management of UTIs in the care home environment (To dip or nit to dip). The aims of this community project include providing accurate diagnosis of UTIs, decreasing inappropriate use of urinary dipsticks, decreasing inappropriate prescribing as well as a review of antibiotic prophylaxis<sup>18</sup>.

No LTCFs reported annual or regular training on appropriate antimicrobial prescribing and three (10%) reported that written guidelines were available for appropriate antimicrobial use. Only 27% of LTCFs reported a programme of surveillance in place for resistant microorganisms, for example, annual reports for MRSA or *Clostridium difficile*. Predicting resistance rates within the community is difficult due to the lack of structured surveillance.

## **Infection prevention and control practice / antimicrobial policy and guidelines**

Over 87% of LTCFs had dedicated IP&C practitioner support with responsibilities for IP&C activities, surveillance and training. The questionnaire did not require detail on who was providing the support. In summary in-house IP&C training was only evident for nursing staff. It is essential that all healthcare workers receive regular IP&C training and updates to ensure compliance with Welsh IP&C standards (and UK standards, where applicable) are maintained. Written protocols were available for management and control of relevant devices, however there was a lack of surveillance conducted and access to HAI surveillance reports. An established programme of surveillance for IP&C was identified in only 43% of LTCFs. Lack of surveillance of infections and microorganisms does not support the monitoring of trends in infection or identifying any potential periods of increased incidence/outbreak of a particular microorganism or infection. Hand hygiene sessions were organised at the majority of care homes but audits on staff practices were not evident.

In general antimicrobial prescribing guidelines, training and surveillance were not evident in the majority of LTCFs surveyed. Prescribing decisions were conducted by GPs in all LTCFs visited.

## **Conclusion and recommendations**

These findings indicate that there is an increased burden of infection within care home settings in Wales and, increased prescribing rates since the previous survey in 2013. The HAI / AMR agenda remains a priority in Wales across all care settings and estimating the total burden of HAIs across all sectors is important when estimating the financial and economic burden of infection to the NHS.

The current HAI / AMR programme in Wales has various work streams around infection reduction and reducing antimicrobial prescribing as well as collaboration with the 1000 Lives programme (Public Health Wales). However, current surveillance does not extend to LTCFs. The Welsh Government 3 year AMR delivery plan has various task & finish group work streams<sup>19</sup>. In particular, results from this survey, along with the 2017 Wales PPS and annual AMR PPS will be used to inform the UTI and IP&C task & finish groups. In addition, in 2017 / 2018 a new reduction expectation to reduce *E. coli* bloodstream infections was introduced by the Welsh Government. This is in direct response to delivering the UK commitment to halve Gram negative bacteraemias by 20120/21 and will be a priority for all Health Boards and Trusts in Wales, especially in community settings<sup>20</sup>. Further work will be to collaborate with all Wales groups such as Care Forum Wales, Care Inspectorate Wales to standardise practice around RTIs, UTIs and wound care within LTCFs. Additionally there is a need to work with GPS to improve prescribing and diagnosis of infections within LTCFs.

The HAI information and prescribing data from HALT-3 will provide additional evidence for the need to reduce RTIs and UTIs across all settings. In particular the survey enhances the need to address prescribing patterns associated with treatment and prevention of UTIs within LTCFs in Wales. Regular training of all staff on IP&C should be a priority and improved access to up-to-date policy and guidelines around reducing infections is key (e.g. ANTT). Findings from this survey should be utilised in part to focus the work of Health boards / Trusts in Wales and inform Welsh Government on priority areas to reduce infections and antimicrobial prescribing / resistance for the benefit of the population of Wales.

The following quality improvement priorities are recommended:

- Implement interventions to reduce the burden of RTIs (such as mouth care bundles, promotion of flu vaccine, keeping well to prevent infection)
- Implement multimodal interventions to reduce the burden of UTIs (hydration initiatives, CAUTI bundles, urine sampling, appropriate prescribing of antimicrobials)
- Review the resources required to prevent infections and antimicrobial resistance with a particular focus on the need to address prevention and management in the community / LTCFs
- Work with GPs to improve diagnosis of infection and prescribing within LTCFs
- Spread current best practices for reducing HCAI using a whole health economy approach (cross specialty and care setting boundary work to implement change)
- Utilise 1000 lives programme to share best practice in HCAI reduction and antimicrobial prescribing
- Improve support and education within LTCFs around antimicrobial prescribing guidance and IP&C policy and guidelines for the prevention or reduction of infection
- Provide improved access to up-to-date policies and guidelines that are applicable

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