

# Antibiotic prescribing in long-term care facilities in Slovenia, a point prevalence study

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# Slovenia

- **~ 2,000,000 inhabitants,**
- **almost 20% > 65 years,**
- **117 long-term care facilities (LTCF) with more than 20,000 beds (~ 1% of population),**
- **Slovenian LTCF are large with an average of 200 beds.**



Population is ageing.

Infections in elderly are more frequent and more severe.

Antibiotics are frequently prescribed to patients in long-term care facilities (LTCF).

## Aim

To investigate the **prevalence and practice of antimicrobial prescribing** in LTCF in Slovenia, and identify targets for quality improvement.

First nation-wide study on antimicrobial prescribing in LTCF in Slovenia.

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-McClellan P, Hughes C, Tunney M, Goossens H, Jans B. Antimicrobial prescribing in European nursing homes. J Antimicrob Chemother 2011; 66: 1609-16.

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# **Patients and methods**

# 2016 Calendar

## January 2016

| W  | S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|----|
| 53 |    |    |    |    |    | 1  | 2  |
| 1  | 3  | 4  | 5  | 6  | 7  | 8  | 9  |
| 2  | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 3  | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| 4  | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 5  | 31 |    |    |    |    |    |    |

## February 2016

| W | S  | M  | T  | W  | T  | F  | S  |
|---|----|----|----|----|----|----|----|
| 5 |    | 1  | 2  | 3  | 4  | 5  | 6  |
| 6 | 7  | 8  | 9  | 10 | 11 | 12 | 13 |
| 7 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 8 | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| 9 | 28 | 29 |    |    |    |    |    |

## March 2016

| W  | S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|----|
| 9  |    |    | 1  | 2  | 3  | 4  | 5  |
| 10 | 6  | 7  | 8  | 9  | 10 | 11 | 12 |
| 11 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 12 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| 13 | 27 | 28 | 29 | 30 | 31 |    |    |

## April 2016

| W  | S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|----|
| 13 |    |    |    |    |    | 1  | 2  |
| 14 | 3  | 4  | 5  | 6  | 7  | 8  | 9  |
| 15 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| 17 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |

## May 2016

| W  | S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|----|
| 18 | 1  | 2  | 3  | 4  | 5  | 6  | 7  |
| 19 | 8  | 9  | 10 | 11 | 12 | 13 | 14 |
| 20 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 22 | 29 | 30 | 31 |    |    |    |    |

## June 2016

| W  | S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|----|
| 22 |    |    |    | 1  | 2  | 3  | 4  |
| 23 | 5  | 6  | 7  | 8  | 9  | 10 | 11 |
| 24 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 25 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 26 | 26 | 27 | 28 | 29 | 30 |    |    |

## July 2016

| W  | S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|----|
| 26 |    |    |    |    |    | 1  | 2  |
| 27 | 3  | 4  | 5  | 6  | 7  | 8  | 9  |
| 28 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 29 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| 30 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 31 |    |    |    |    |    |    |

## August 2016

| W  | S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|----|
| 31 |    | 1  | 2  | 3  | 4  | 5  | 6  |
| 32 | 7  | 8  | 9  | 10 | 11 | 12 | 13 |
| 33 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 34 | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| 35 | 28 | 29 | 30 | 31 |    |    |    |

## September 2016

| W  | S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|----|
| 35 |    |    |    |    | 1  | 2  | 3  |
| 36 | 4  | 5  | 6  | 7  | 8  | 9  | 10 |
| 37 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 38 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 39 | 25 | 26 | 27 | 28 | 29 | 30 |    |

## October 2016

| W  | S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|----|
| 39 |    |    |    |    |    |    | 1  |
| 40 | 2  | 3  | 4  | 5  | 6  | 7  | 8  |
| 41 | 9  | 10 | 11 | 12 | 13 | 14 | 15 |
| 42 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| 43 | 23 | 24 | 25 | 26 | 27 | 28 | 29 |
| 44 | 30 | 31 |    |    |    |    |    |

## November 2016

| W  | S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|----|
| 44 |    |    | 1  | 2  | 3  | 4  | 5  |
| 45 | 6  | 7  | 8  | 9  | 10 | 11 | 12 |
| 46 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 47 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| 48 | 27 | 28 | 29 | 30 |    |    |    |

## December 2016

| W  | S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|----|
| 48 |    |    |    |    | 1  | 2  | 3  |
| 49 | 4  | 5  | 6  | 7  | 8  | 9  | 10 |
| 50 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 51 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 52 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |



117 Slovenian LTCF



20224 residents

# Data were collected in **one single day per LTCF** with two on-line questionnaires:

- on **LTCF characteristics and population:**

- number of residents,
- number of wheelchair bound residents,
- number of bedridden residents,
- number of residents with dementia,
- number of residents taking antimicrobial treatment,
- characteristics of the physician working in the facility.

- on **currently prescribed systemic antibacterial drugs:**

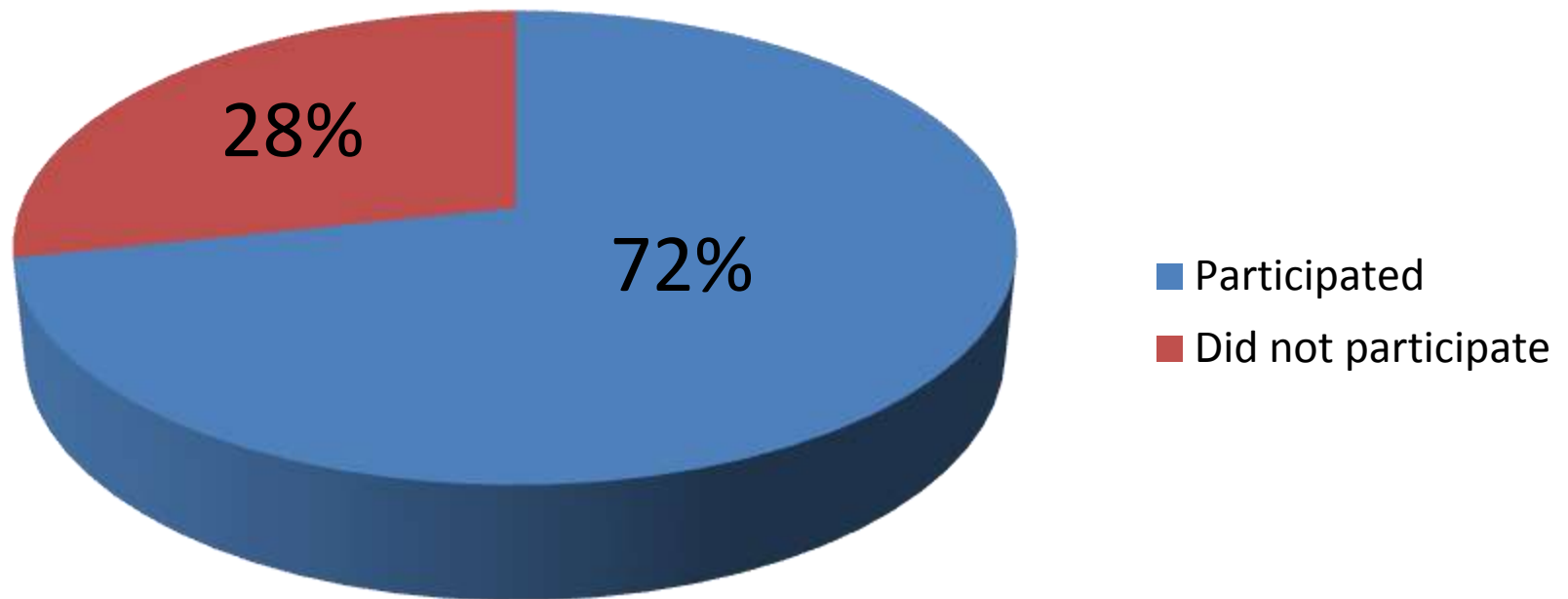
- resident's age, gender,
- antimicrobial use (compound name, indication for therapy, prescribed doses, route of administration),
- risk factors (presence of urinary catheter, vascular catheter and wounds),
- care load indicators (faecal and/or urinary incontinence, dementia, impaired mobility),
- who prescribed the antibiotic treatment (general practitioner that work in the LTCF, doctor in hospital, specialist's clinic, doctor on duty),
- diagnostic tests (imaging, microbiological testing, blood cell count, c-reactive protein, urine dipstick),
- colonisation with multidrug resistant bacteria (MRSA, VRE, ESBL, CRE).

# Results



# Participation

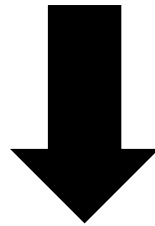
- 80 / 117 LTCF responded to our invitation;
- 13,022 residents participated in our study (71.6% of all eligible residents in Slovenian LTCF).



**Participation of residents in Slovenian LTCF**

**317 residents out of 13022**

received antibiotics on the day the survey was  
conducted.



**Prevalence: 2.4%**

(min-max per LTCF: 0-7.6%)

Further analysis was performed on 255 patients who signed **informed consent**.

**Mean age: 83.4 years**  
min-max: 46-100 years

70% were women



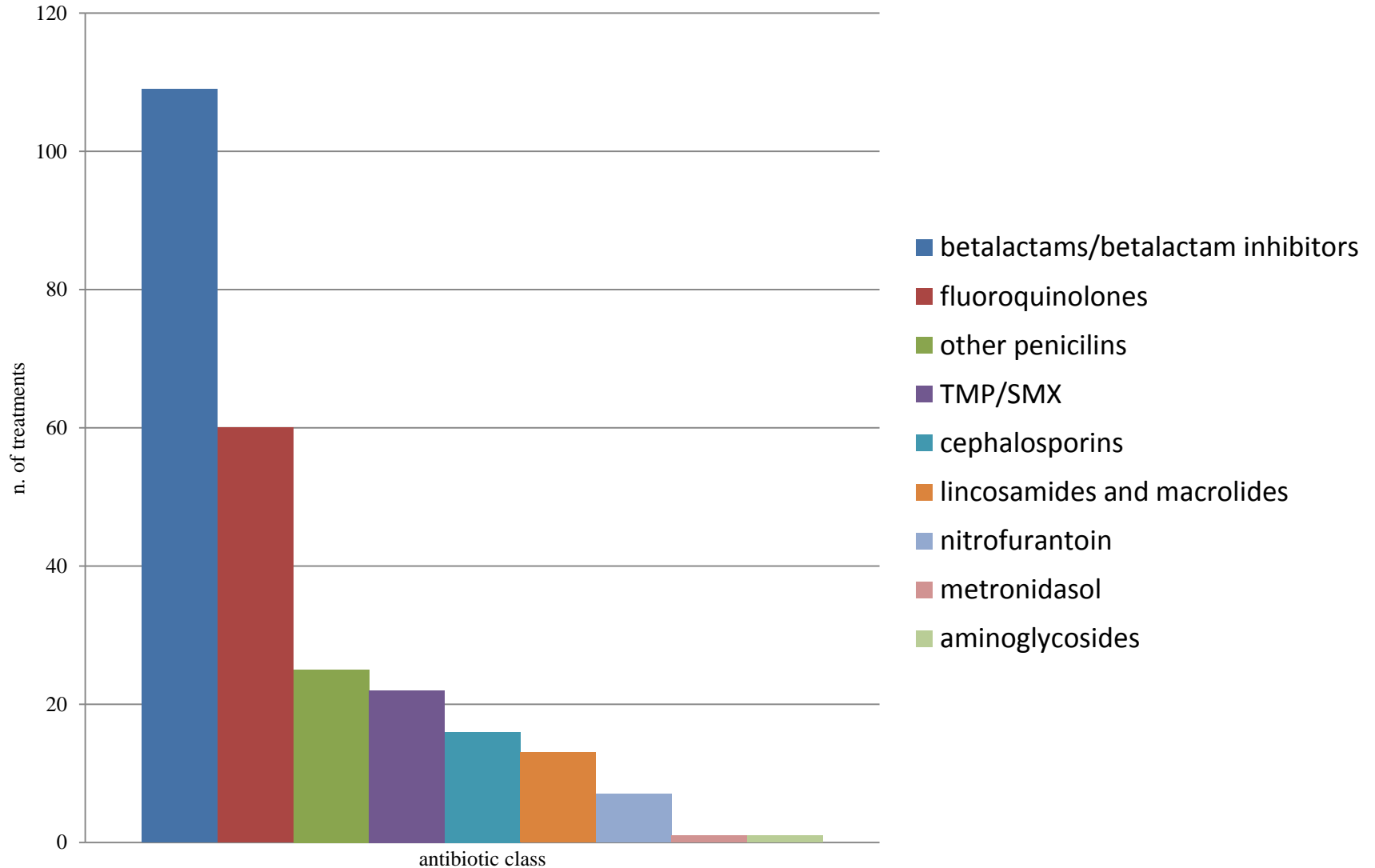
## **Indication** for antibiotic therapy:

- Respiratory tract infections: 109 (42.7%)
- Urinary tract infections: 85 (33.3%)
- Skin and skin structure infections: 50 (19.6%)

## Most prescribed antibiotics:

**1. co-amoxiclav: 109 (43%)**

**2. ciprofloxacin: 33 (13%)**



# Diagnostic tests

| Respiratory tract infections        | Urinary tract infections               | Skin and skin structure infections                                    |
|-------------------------------------|--|---|
| Blood cell count: 60 (33.3% of RTI) | Urine dipstick test: 71 (48.5% of UTI) | No diagnostic tests: 28 (42.4% of skin and skin structure infections) |
| C-reactive protein: 66 (36.6%)      | Blood cell count: 34 (21.9%)           | Blood cell count: 15 (22.7%)  |
| No diagnostic tests: 21 (11.7%)     | C-reactive protein: 33 (21.2%)         | C-reactive protein: 15 (22.7%)  |

Microbiological testing was performed in 5.2% of the cases.

# Prevalence of colonisation with **multidrug resistant bacteria** in patients receiving antibiotic treatment.

| Multidrug resistant bacteria | n (% of residents receiving antibiotics) |
|------------------------------|--|
| MRSA                         | 11 (4.5%)                                |
| ESBL                         | 39 (15.8%)                               |
| CRE                          | 2 (0.8%)                                 |
| VRE                          | 0  |

Prevalence of colonisation with multidrug resistant bacteria in UMC Ljubljana in 2015:

- MRSA: 0.5 % of patients,
- ESBL: 1.3 % of patients,
- CRE: 0.006 % of patients

# Statistical correlations

Statistically significant correlations:

- the age of **80 and above** and antibiotic treatment ( $p=0.0425$ ,  $\chi^2$  test,  $OR=1.33$ ),
- **bedridden residents** and antibiotic treatment ( $p<0.01$ ,  $\chi^2$  test,  $OR=1.62$ ).
- Advanced dementia was **not** significantly correlated with antibiotic prescribing ( $p=0.406$ ,  $\chi^2$  test,  $OR=1.12$ ).
- The usage of wheelchair was also **not** significantly correlated with antibiotic prescribing ( $p=0.286$ ,  $\chi^2$  test,  $OR=1.16$ ).



# The mean prevalence of antimicrobial prescribing in Slovenian LTCF is **2.4%**.

Prevalence of antimicrobial prescribing in LTCF in European countries from HALT-2 study (2013):

| Country               | Prevalence of antibiotic treatment (%) |
|-----------------------|--|
| Belgium               | 5,1 %                                  |
| Denmark               | 11,3 %                                 |
| Italy                 | 3,9 %                                  |
| Ireland               | 9,7 %                                  |
| Germany               | 1,9 %                                  |
| Hungary               | 1,3 %                                  |
| Portugal              | 7,7 %                                  |
| UK – Northern Ireland | 10,6 %                                 |
| VB – Wales            | 7,5 %                                  |

# Conclusions

The prevalence of antimicrobial treatment in Slovenian LTCF is relatively low.

However,

frequent prescription of co-amoxiclav and fluoroquinolones may lead to an increase of multidrug resistant organisms.

Stewardship interventions to improve antibiotic prescribing in LTCF should be considered.



# Thank you!

