THE GLOBAL POINT PREVALENCE SURVEY
on Antimicrobial Consumption and Resistance

Results on the 2015 Global-PPS

Presentation and posters presented at ECCMID congress

9-12 April 2016

Amsterdam, The Netherlands

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Introduction

Dear colleague,

The Global Point Prevalence Survey of Antimicrobial Consumption and Resistance (GLOBAL-PPS) is a unique and ambitious project that started in 2015 to monitor rates of antimicrobial prescribing and resistance in patients admitted to hospitals from all continents.

We meanwhile have been able to establish a global network for point prevalence surveys and included many different hospitals from many countries worldwide. Testimonials from participants showed the need and support to conduct these kind of studies. This PPS helped to create global awareness about antibiotic use and resistance and will be instrumental in planning and supporting local as well as national stewardship interventions in a range of resource and geographical settings.

The critical benefits for the hospitals were numerous. The Global-PPS provided, amongst others, a tool to:
- *Evaluate antimicrobial prescribing practices in hospitals*
- *Compare data locally, nationally, regionally and worldwide*
- *Identify feasible targets to improve antimicrobial prescribing*

Above all, the Global-PPS aids changing prescribing practises and can measure the impact of interventions through repeated PPSs.

Essentially, this Global-PPS ensured the collection of valid and comparable data using a validated and standardized protocol. Data were completely anonymously entered online and remained property of the participating hospital. Participation of hospitals and all fieldwork at the hospital level was done on a voluntary basis.

The database, hosted at the University of Antwerp, Belgium, is accessible to scientists. The Global-PPS team encourages local, country or regional specific analysis after mutual agreement for data-sharing. A publication policy is available on request.

This poster booklet includes results on 17 out of the 53 countries who participated to the first Global-PPS conducted in 2015. We hope you will enjoy reading these country reports on antimicrobial use that were presented at ECCMID in April 2016.

Ann Versporten
Network coordinator and data management

Herman Goossens
Project lead

Laboratory of Medical Microbiology, Vaccine & Infectious Disease Institute,
Faculty of Medicine and Health Science, University of Antwerp, Antwerp, Belgium

Hundreds of healthcare professionals who were voluntarily collecting and submitting data globally

The Global-PPS development group

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People who voluntary helped us with translation of protocol and data-collection templates

Translated versions have been critically revised if possible.

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Disclosures

- bioMérieux is the sole sponsor of the GLOBAL Point Prevalence Survey. The funder has no role in study design, data collection, data analysis, data interpretation, or writing the report. Data are strictly confidential and stored anonymous at the coordinating centre of the University of Antwerp.

Countries with a poster presented during ECCMID-2016 or elsewhere

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Global-PPS on antimicrobial use and resistance in different countries

The Global Point Prevalence Survey of Antimicrobial Consumption and Resistance in 335 Hospitals Worldwide

Ann Versporten, Nico Drapier, Peter Zarb, Isabelle Caniaux, Marie Françoise Gros, Mark Miller, Vincent Jarlier, Dilip Nathwani, Herman Goossens

26th ECCMID Amsterdam, Netherlands 9 - 12 April 2016

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Antimicrobial prevalence rates worldwide
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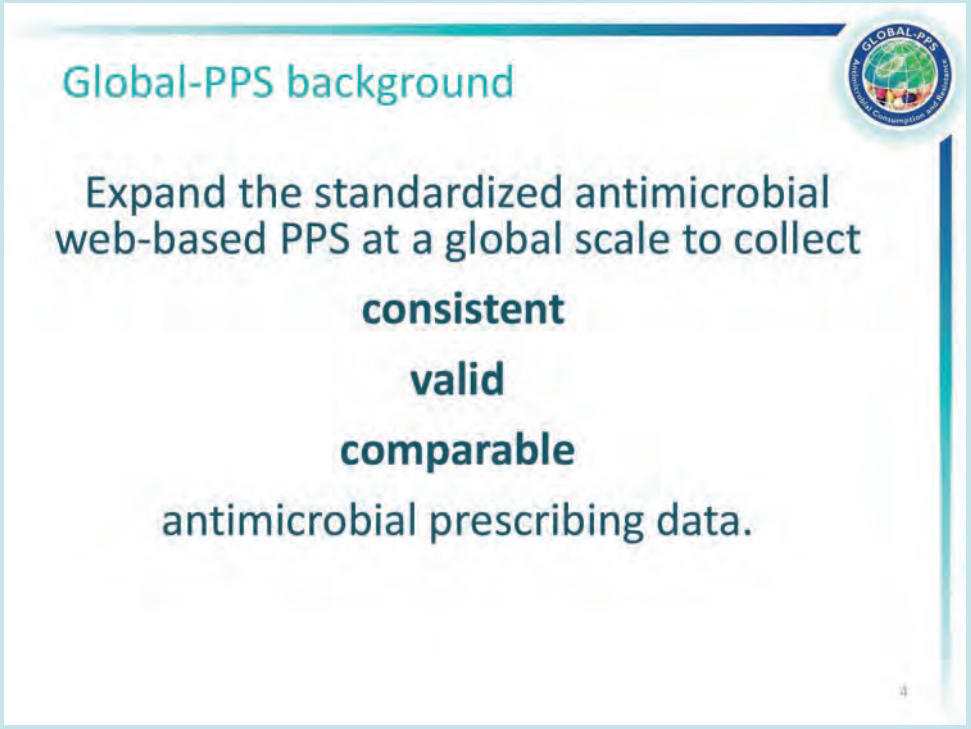

Global-PPS background
Expand the standardized antimicrobial web-based PPS at a global scale to collect
consistent
valid
comparable
antimicrobial prescribing data.

Global-PPS Aims

- Monitor rates of antimicrobial prescribing in hospitalized adults, children and neonates.
- Determine the variation in drug, dose and indications of antimicrobial prescribing across continents.
- Identify targets to improve quality of antimicrobial prescribing.
- Help designing hospital interventions to promote prudent antimicrobial use.
- Increase public health capacity.

Methods

- Any hospital welcome to join the Global-PPS network.
- Data-collection : February-June 2015
- All wards of the hospital were included “once”
- Denominator collected at ward level
  - ✓N patients admitted
  - ✓N available beds

Essential data to collect: numerator

For each patient receiving an antimicrobial:

- age, gender and weight

For each antimicrobial prescription:

- Antimicrobial agent/s (substance level) with dose per administration - N doses/day - route of administration
- Reasons for treatment: what the clinician tends to treat
- Indication for therapy (CAI, HAI; Medical/Surgical Prophylaxis)
- Extra quality indicators:
  - ✓Reason of prescription written in notes
  - ✓Stop or review date written in notes
  - ✓Prescription compliant with local guidelines
- Treatment based on biomarker and which one
- Microbiology data (if targeted treatment)

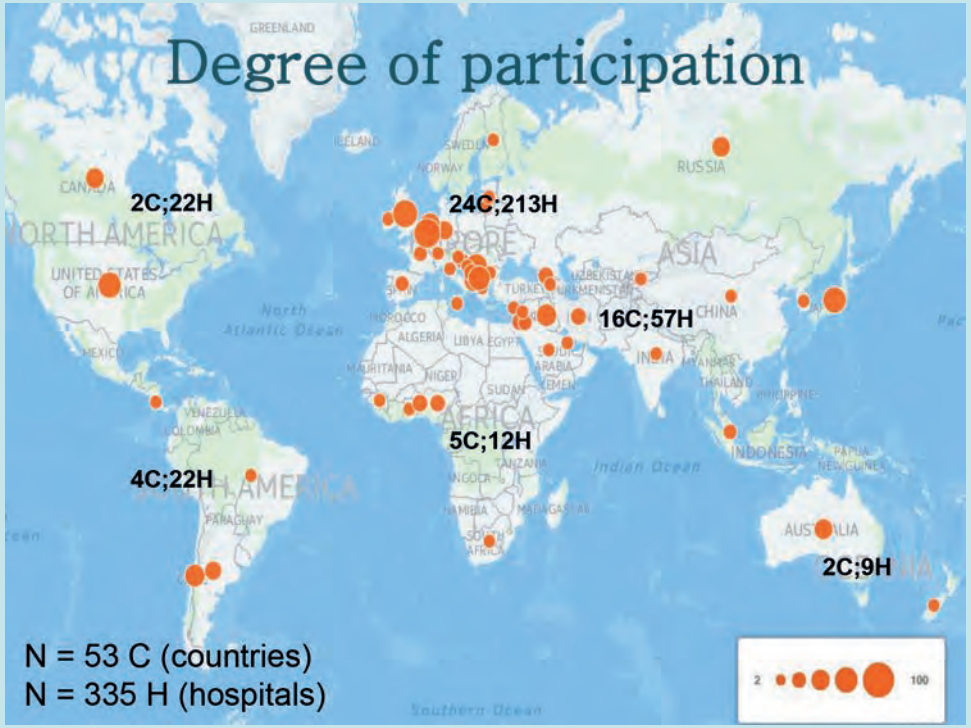
Global-PPS data collection, entry and management

1. Data collection on **paper forms** :
   - Ward form (denominator data)
   - Patient form (numerator data)
2. **Web-based** data-entry, verification, validation and reporting with the help of the Global-PPS programme.

URL:

www.global-pps.com


RESULTS


Degree of participation
2C;22H
24C;213H
16C;57H
5C;12H
4C;22H
2C;9H
N = 53 C (countries)
N = 335 H (hospitals)
2
100

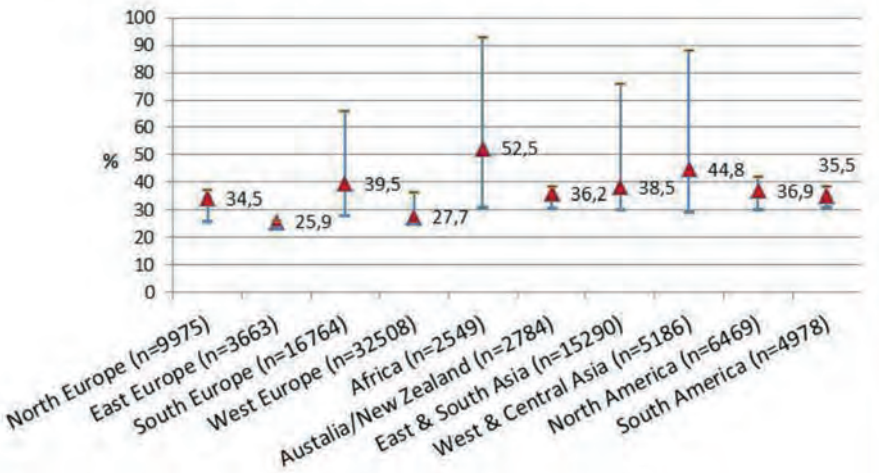
Collected and recorded data

100,166 admitted inpatients
34,726 patients treated with at least one antimicrobial

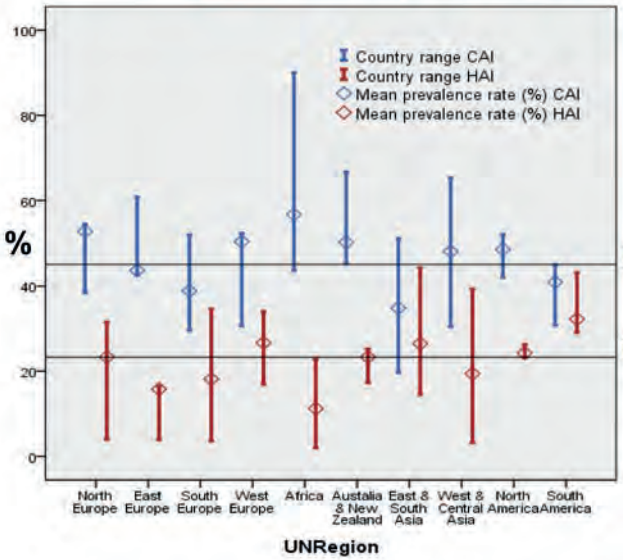
48,565 antimicrobial prescriptions

- 43,513 (**89.6%**) antibacterials for systemic use (ATC J01)
- 2,062 (**4.3%**) antimycotics for systemic use (ATC J02)
- 1,137 (**2.3%**) drugs to treat tuberculose (ATC J04)
- 932 (**1.9%**) nitroïmidazole derivatives (ATC code P01AB)
- 781 (**1.6%**) intestinal anti-infectives (ATC code A07)
- 126 (**0.3%**) neuraminidase inhibitors (ATC code J05AH)

Mean antimicrobial prevalence rates (%) by UN-region (country-ranges)



Antibiotic prevalence rates (%) for a CAI versus HAI by UN region



Mean CAI = 46.6%

Mean HAI = 22.1%

Includes only systemic antibiotics (ATC J01) for therapeutic use
Analyses at patient level

Top 10 most prescribed antibiotics (ATC J01) for therapeutic use, by UN region

Antimicrobial name N antibiotics (ATC J01)	North Europe % (n=3441)	East Europe % (n=651)	South Europe % (n=4909)	West Europe % (n=8074)	Africa % (n=1366)	Austalia & New Zealand % (n=1021)	East & South Asia % (n=4785)	West & Central Asia % (n=2088)	North America % (n=2392)	South America % (n=1964)	All Regions % (n=30691)
Amoxicillin/enzyme inhibitor	**13.4**	**8.6**	**6.3**	**27.5**	**7.2**	**8.3**	**9.7**	3.0	1.8	0.6	12.4
Ceftriaxone	3.4	**24.9**	**17.4**	**5.9**	**16.1**	**10.2**	**9.3**	**18.3**	**13.6**	**14.4**	11.0
Piperacillin/enzyme inhibitor	**15.4**	0.5	**7.6**	**9.9**	0.2	**9.1**	**9.6**	**6.4**	**12.9**	**5.9**	9.2
Ciprofloxacin	3.7	**9.1**	**9.7**	**7.3**	**7.8**	3.7	4.2	**5.7**	**6.1**	**5.4**	6.4
Vancomycin	1.8	2.8	4.5	3.4	1.6	3.6	**6.4**	**5.7**	**12.0**	**11.1**	5.1
Meropenem	4.9	**5.1**	4.0	4.1	2.9	3.1	**7.8**	**5.9**	**5.8**	**5.9**	5.1
Metronidazole	**5.6**	2.3	4.5	2.5	**12.4**	**8.3**	3.0	**6.2**	**5.4**	**8.0**	4.7
Levofloxacin	0.9	2.0	4.0	3.1	1.8	/	**7.4**	0.7	**11.7**	1.3	3.9
Amoxicillin	**9.5**	1.8	2.5	3.9	**5.3**	**5.1**	1.0	4.3	1.7	1.1	3.6
Cefuroxime	2.9	0.6	1.8	4.2	**7.8**	**5.1**	2.4	4.5	0.5	0.3	3.0

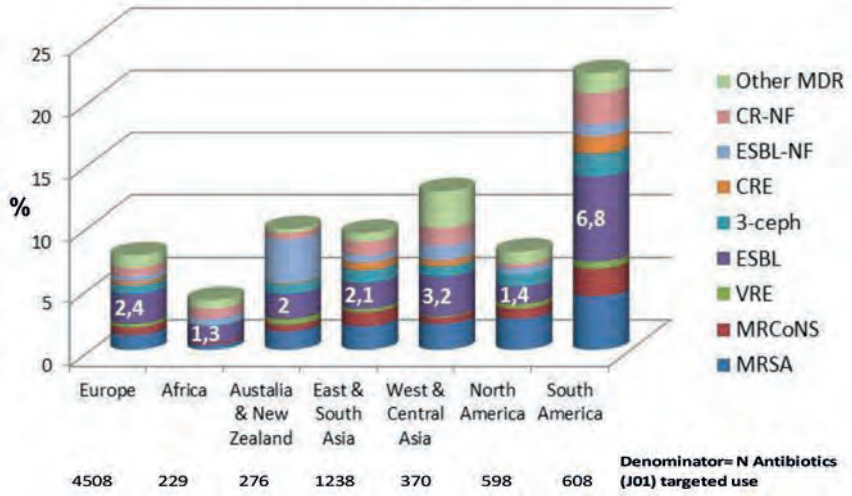
Bold=proportional use >5%
Overview of antibiotic prescribing rates for prophylactic use are provided in poster n° P1222

Antibiotic (ATC J01) quality indicators for therapeutic use

Antibiotic quality indicators (N antibiotics for CAI and HAI)	No guidelines %	guideline compliant %	Reason in notes %	Stop review date documented %	Parenteral RoA %	Targeted treatment %
North Europe (n=3441)	7.1	83.9	89.5	52.7	68.0	15.9
East Europe (n=651)	1.1	90.0	77.0	38.6	85.1	15.7
South Europe (n=4909)	25.1	77.3	75.9	30.2	82.3	25.8
West Europe (n=8074)	10.1	80.4	86.4	37.2	67.0	32.1
Africa (n=1366)	22.0	71.3	74.2	30.2	78.5	16.8
Austalia & New Zealand (n=1021)	19.0	74.5	94.5	26.9	65.9	27.0
East & South Asia (n=4785)	18.2	84.9	89.8	49.3	80.2	25.9
West & Central Asia (n=2088)	43.3	69.2	79.3	19.7	83.8	17.7
North America (n=2392)	17.2	87.2	93.2	34.2	79.3	25.0
South America (n=1964)	22.2	70.4	91.2	42.4	87.8	31.0
All Regions (n=30691)	17.7	80.3	85.5	38.0	75.9	25.5

Overview of quality indicators of antibiotic prescribing for prophylactic use are provided in poster n° P1222

Antibiotic treatment based on microbiology data



Findings

- High differences in overall antibiotic prescribing between and within continents
- Highest antimicrobial prescribing rates were found in Africa, West/Central Asia & South-EU
- High rates of broad spectrum antibiotic prescribing worldwide
  - Top 3: amoxicillin/clavulanic acid, ceftriaxone and piperacillin/tazobactam
- Meropenem represented 5.1% of prescriptions
- Highest quinolone use in North-America
- ESBL-producing Enterobacteriaceae was the most often reported resistant organism

Identified targets for quality improvement of therapeutic antibiotic prescribing

1. Broad spectrum antibiotic prescribing
2. High prevalence rates of HAI
3. Missing guidelines
4. Failure to prescribe according local guidelines
5. Failure to document a stop/review data
6. High parenteral prescribing

Obtain meaningful comparisons

- ✓ Uniformity of data collection: **common simple methodology** and web-based tool for data entry and validation = feasible & achievable surveillance
- ✓ Quality assurance approach
- ✓ Enables **in-depth interpretation** of antimicrobial consumption data at different levels
- ✓ Creation of **reference database** for scientific research and hypothesis formulation at national and international level (data are safeguarded at the University of Antwerp, Belgium, Europe).

Features of the Global-PPS

- **Tool for assessing interventions** to improve antibiotic prescribing in hospitals when PPS repeated
- **Consistency and reproducibility**
- **Improve healthcare quality**
- **Combat antibiotic resistance**
- Improve antibiotic use for **better patient health**

"sustained awareness"

Acknowledgements

- Hundreds of healthcare professionals who were voluntarily collecting and submitting data globally
- The Global-PPS development group
- People who voluntary helped us with translation of protocol and data-collection templates
- So many other people to thank

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ECCMID 2016 (poster P1222)

The Global Point Prevalence Survey of Antimicrobial Consumption and Resistance (Global-PPS): Worldwide Variation of Prophylactic Prescribing

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INTRODUCTION AND PURPOSE

The Global-PPS (www.global-pps.com) monitored antimicrobial prescribing and resistance in hospitals worldwide. We analyzed a sub-group of patients who received an antimicrobial for surgical or medical prophylaxis. Main aims were: 1) to determine the worldwide variation in quantity and quality of prophylactic prescribing ; 2) to identify targets for quality improvement.

METHODS

A point prevalence survey of antimicrobial prescribing was carried out in February-September 2015 in 335 hospitals in 53 countries of six continental regions, using a standardized and validated method. Data on patients admitted to adult, pediatric & neonatal wards receiving a prophylactic regimen on the day of survey were used. Assessed quality indicators (QI) included choice of antibiotic (for surgical prophylaxis, SP) or antimicrobial (for medical prophylaxis, MP), existence of guidelines and guideline compliance (referring to choice of the drug). Supplementary QI for MP included "documentation of the reason" for MP and whether a "stop/review date was written in the notes". For SP, prolonged antibiotic use was measured.

RESULTS

Top 5 antibiotics for **SP** were cefazolin, ceftriaxone, cefuroxime, metronidazole which was often administered in combination with various different kind of antimicrobials; and amoxicillin/beta-lactamase inhibitor (***Table 1***).

SURGICAL PROPHYLAXIS Antimicrobial name (number of antibiotics J01)	North Europe % (n=400)	East Europe % (n=161)	South Europe % (n=2125)	West Europe % (n=1172)	Africa % (n=344)	Austalia & New Zealand % (n=168)	East & South Asia % (n=1500)	West & Central Asia % (n=628)	North America % (n=254)	South America % (n=385)	Grand Total % (n=7137)
Cefazolin	**8.3**	**7.5**	**18.4**	**56.4**	1.2	**64.3**	**24.3**	**11.1**	**59.8**	**26.5**	**26.6**
Ceftriaxone	1.8	**30.4**	**27.3**	0.6	**26.7**	1.2	**5.3**	**24.4**	1.6	**11.2**	**14.2**
Cefuroxime	**21.3**	**40.4**	**5.7**	**7.8**	**15.1**	1.2	**16.7**	**10.8**	0.4	0.5	**10.4**
Metronidazole	**10.8**		**10.1**	4.1	**20.6**	**6.5**	**9.1**	**12.3**	**5.9**	**13.5**	**9.4**
Amoxicillin/enzyme inh.	**22.0**	**8.1**	2.9	**11.6**	**4.9**	**6.0**	2.8	**4.9**		0.3	**5.6**
Ciprofloxacin	**7.3**	1.9	**5.2**	3.7	**10.8**		0.9	**5.4**	**5.1**	**6.5**	4.3
Gentamicin	**8.8**	**8.7**	**8.6**	0.3	1.7	3.6	1.4	1.9	1.6	**5.7**	4.3
Vancomycin	2.0		1.5	1.3		6.0	1.0	1.4	**6.3**	2.1	1.6
Amoxicillin	2.8	0.6	1.2	0.6	**7.6**		0.9	1.9		0.3	1.4
Cefalotin				0.3			0.7			**14.5**	1.0
Cefalexin	0.5		0.8			**6.5**	1.7	0.3	1.2	0.5	0.9
Teicoplanin	**6.0**		0.2				0.8	1.3			0.7

Table 1. Prevalence rates of antibiotics (ATC J01) prescribed for surgical prophylaxis worldwide

Most often administered antimicrobials for **MP** were sulfamethoxazole and trimethoprim, mainly for MP in general without targeting a specific site (MP-Gen) or respiratory MP; fluconazole, mainly for MP-Gen; ceftriaxone for various reasons; ciprofloxacin mainly for urinary MP. Africa most often prescribed metronidazole and Oceania nystatin (***Table 2***).

MEDICAL PROPHYLAXIS Antimicrobial name (number of antimicrobials)	North Europe % (n=530)	East Europe % (n=249)	South Europe % (n=1045)	West Europe % (n=970)	Africa % (n=142)	Austalia & New Zealand % (n=188)	East & South Asia % (n=1293)	West & Central Asia % (n=251)	North America % (n=314)	South America % (n=223)	Grand Total % (n=5205)
Sulfamethoxazole and trimethop	**16.2**	4.0	**9.8**	**23.5**	**14.1**	**33.5**	**35.0**	**13.1**	**17.5**	**30.5**	21.5
Fluconazole	**7.9**	**11.2**	**8.5**	**11.0**	**9.9**	2.1	**14.7**	**5.6**	**15.0**	**11.2**	10.8
Ceftriaxone	0.8	**40.2**	**11.3**	0.3	**8.5**		0.5	**13.1**	1.3	2.2	5.5
Ciprofloxacin	4.7	**7.6**	**8.2**	3.7	4.2	0.5	2.0	2.4	1.0	2.7	4.1
Azithromycin	**7.7**	0.4	1.6	**7.8**	2.1	0.5	0.9	**6.8**	2.5	**7.2**	3.7
Gentamicin	**8.1**	1.2	**5.6**	1.0	**5.6**		0.8	3.6	**7.0**	3.1	3.3
Levofloxacin		0.4	3.1	1.9	1.4		**5.6**	1.2	**7.3**	0.9	3.0
Ampicillin	0.6	1.6	**6.2**	0.6			1.6	2.4	**7.0**	**6.7**	2.7
Metronidazole	0.8	**7.6**	4.2	0.4	**13.4**		0.8	**11.6**	1.9	2.2	2.7
Nystatin	3.4		1.6	1.0	0.7	**26.6**	0.7	0.4	**5.1**		2.3
Amphotericin b	2.1		0.5	**5.1**		**9.6**	2.1				2.1
Benzylpenicillin	**11.1**	1.2	0.6	2.4			0.2		0.6		1.8

Table 2. Prevalence rates of antimicrobials prescribed for medical prophylaxis worldwide

IN GENERAL (updated data as compared to abstract)

Of 48,565 antimicrobials administered to adults, children and neonates worldwide, 25.7% (n=12,464) were administered for prophylaxis among which 81.6% to adults and 18.4% to children/neonates. Out of all prophylactic use, 58.2% of antimicrobials were administered for surgical prophylaxis (n=7259) of which 98.3% were systemic antibiotics (ATC J01). Out of all antimicrobial prescriptions for medical prophylaxis (n=5205); 73.9% were antibiotics and 18.4% antifungals for systemic use.

Quality Indicators

SP was predominantly administered for more than one day in African, Asian, South American and European hospitals (***Figure 1***).

In general, for **SP and MP,** guidelines were most often missing in Africa, Asia and East- & South Europe. Guideline compliance was remarkable lower when prescribed for surgical prophylaxis. The rate of documenting a stop/review date for MP is low worldwide (***Table 3***).

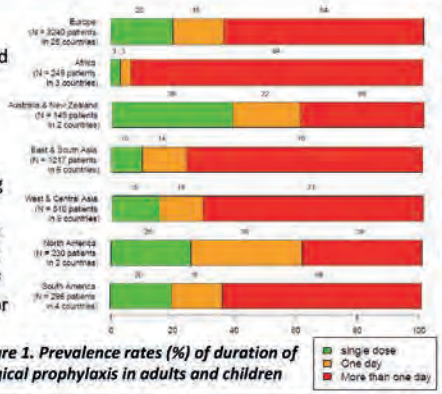

Figure 1. Prevalence rates (%) of duration of surgical prophylaxis in adults and children

Table 3. Quality indicators for SP (only antibiotics are considered) and MP (all antimicrobials)

Quality indicator	North Europe % (n=935)	East Europe % (n=423)	South Europe % (n=3192)	West Europe % (n=2150)	Africa % (n=544)	Austalia & New Zealand % (n=356)	East & South Asia % (n=2800)	West & Central Asia % (n=885)	North America % (n=569)	South America % (n=610)	Grand Total % (n=12464)
Surgical prophylaxis											
No guideline existing	8.4	37.9	40.5	6.5	22.4	8.3	26.7	32.5	8.6	10.3	25.1
Guideline compliant (yes)	77.9	94.4	57.2	71.5	81.1	55.2	72.4	61.0	77.9	48.4	67.3
Medical prophylaxis											
No guideline existing	20.6	32.5	29.4	16.3	39.4	25.0	28.7	40.2	11.1	14.8	24.9
Guideline compliant (yes)	98.1	80.4	85.1	88.3	65.5	94.9	90.1	58.5	93.2	87.2	88.0
Reason in notes (yes)	80.2	57.8	66.4	62.6	63.4	70.2	47.2	54.6	73.9	80.7	62.5
Stop/review date documented	41.7	47.4	33.7	26.8	18.3	12.2	24.4	16.3	24.2	35.9	29.1

CONCLUSION

Various prophylactic prescription practices were observed worldwide. We identified five quality indicators: 1) surgical prophylaxis with broad spectrum antibiotics, 2) prolonged surgical prophylaxis, 3) missing guidelines for SP and MP, 4) failure to prescribe according to local guidelines and 5) failure to document a stop/review data for medical prophylaxis.

Disclosures: "**bioMérieux** is the sole sponsor of the GLOBAL Point Prevalence Survey. The funder has no role in study design, data collection, data analysis, data interpretation, or writing the report. Data are strictly confidential and stored anonymous at the coordinating centre of the University of Antwerp."

ECCMID 2016 (poster P4009)

The Global Point Prevalence Survey of Antimicrobial Consumption and Resistance (Global-PPS) in 335 Hospitals Worldwide : Management of Adult Patients with Pneumonia

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INTRODUCTION AND PURPOSE

The Global-PPS (www.global-pps.com) aimed to assess variation of antimicrobial prescribing worldwide. Lower respiratory tract infections (LRTI), including pneumonia, are the most common indication for antibiotic prescribing worldwide. We aimed to describe the antibiotic treatment, use of biomarkers and antibiotic quality indicators for the management of LRTI in six continental regions.

METHODS

A point prevalence survey of antimicrobial prescribing was carried out in February-September 2015 in 335 hospitals in 53 countries using a standardized and validated method (*see ECCMID-2016 presentation O603*). Data on patients admitted to adult wards and receiving an antimicrobial on the day of the survey for pneumonia were used.

RESULTS

Overall **prevalence rate of pneumonia** (PNEU) varied from 11% in Africa to 26% in North-Europe (***Figure 1***). Overall, 19.3% of hospitalized adult patients received treatment for PNEU and of those, 38.8% were being treated for a hospital-acquired infection (HAI). The largest proportions of patients treated for HAI were found in America and East & South Asia (***Table 1***).

Overall, the **most commonly prescribed antibiotics** for a community acquired pneumonia (**CAP**) were amoxicillin/beta-lactamase inhibitor, ceftriaxone, piperacillin/beta-lactamase inhibitor, regardless of biomarker use, with various prevalence rates found worldwide (***Table 2***). For **HAI-PNEU**, the most common antibiotics were piperacillin/beta-lactamase inhibitor, amoxicillin/beta-lactamase inhibitor and meropenem (***Table 3***).

Table 2. Most used antibiotics (%) prescribed for CAP in Adults (adult wards)

PNEU-CAI Antimicrobial name (number of antibiotics, ATC code J01)	North Europe % (n=673)	East Europe % (n=70)	South Europe % (n=669)	West Europe % (n=1357)	Africa % (n=119)	Austalia & New Zealand % (n=173)	East & South Asia % (n=672)	West & Central Asia % (n=211)	North America % (n=399)	South America % (n=191)	Grand Total % (n=4436)
Amoxicillin/enzyme inhibitor	**16.3**	**14.3**	**8.7**	**44.5**	**22.7**	**10.4**	**17.0**	1.9	1.8	2.1	21.1
Ceftriaxone	2.2	**34.3**	**25.3**	**7.1**	**20.2**	**8.7**	**12.5**	**28.0**	**18.3**	**32.5**	13.7
Piperacillin/enzyme inhibitor	**9.5**	1.4	**6.6**	**9.1**		**8.1**	**8.9**	**7.1**	**11.5**	**5.8**	8.3
Levofloxacin	2.2	**10.0**	**10.2**	1.1			**12.1**	4.3	**24.8**	**6.8**	6.8
Clarithromycin	**18.9**	2.9	3.6	4.9	0.8	1.2	**5.8**	3.3	0.5	**14.7**	6.6
Amoxicillin	**20.5**		2.2	4.3	**6.7**	**8.7**	0.6	4.7	1.3	1.0	5.6
Azithromycin			4.5	0.9	**16.0**	**8.7**	4.6	**11.4**	**12.0**		3.9
Ciprofloxacin	1.5	**8.6**	**10.6**	2.7	2.5	2.3	2.5	2.4	1.3		3.5
Doxycycline	**12.6**		1.3	0.7		**12.7**	2.7	0.5	2.0	1.0	3.4
Moxifloxacin	0.1	1.4	1.5	**8.8**			1.0	4.7			3.3
Meropenem	2.2	**5.7**	1.9	2.1	0.8	1.7	4.9	2.8	**5.3**	1.0	2.8
Cefuroxime	1.0		1.5	3.0	**10.1**	**6.9**	2.2	2.4	1.0	0.5	2.4
Metronidazole	3.3	1.4	3.7	0.2	**9.2**	1.2	0.3	2.8	3.3	**5.8**	2.1
Vancomycin	0.1		1.3	0.8		0.6	1.5	0.5	**8.5**	3.7	1.6

Sorted on worldwide total use (last column from highest to lower use); Use of >5% is coloured in bold

Table 3. Most used antibiotics (%) prescribed for PNEU-HAI in Adults (adult wards)

PNEU-HAI Antimicrobial name (number of antibiotics, ATC code J01)	North Europe % (n=378)	East Europe % (n=51)	South Europe % (n=308)	West Europe % (n=838)	Africa % (n=15)	Austalia & New Zealand % (n=93)	East & South Asia % (n=520)	West & Central Asia % (n=113)	North America % (n=265)	South America % (n=200)	World-wide % (n=2781)
Piperacillin/enzyme inhibitor	**32.8**	2.0	**19.8**	**24.6**		**17.2**	**22.1**	**22.1**	**16.2**	**15.0**	22.3
Amoxicillin/enzyme inhibitor	**12.4**	5.9	7.8	**18.6**		**20.4**	7.7	3.5	1.9	0.5	10.8
Meropenem	8.2	**13.7**	6.8	8.7	**13.3**	4.3	**12.5**	**9.7**	7.9	**15.0**	9.5
Ceftriaxone	0.3	7.8	4.9	8.2		**15.1**	5.6	**11.5**	9.8	5.5	6.5
Levofloxacin	2.6	2.0	8.1	1.4			**11.0**		**22.3**	0.5	5.9
Vancomycin	1.1	3.9	5.5	2.4	6,7	4.3	6.0	7.1	**15.8**	**17.0**	5.9
Ciprofloxacin	2.9	3.9	5.5	4.7	**13.3**	2.2	4.0	4.4	1.9	3.0	4.0
Cefepime		**9.8**	1.0	4.2			1.5	4.4	5.7	1.0	2.6
Colistin	0.3	7.8	3.9	0.7			1.5	**10.6**	0.8	8.0	2.2
Imipenem/enzyme inhibitor		5.9	4.5	0.7	**13.3**		0.4	4.4		6.5	1.6
Cefoperazone, combinations		**15.7**					1.9				0.6
Ertapenem	1.1		1.0		**26.7**	1.1	0.2				0.5

Sorted on worldwide total use (last column from highest to lower use); Use of >10% is coloured in bold

Figure1. Worldwide prevalence rate of pneumonia by indication (Global-PPS)

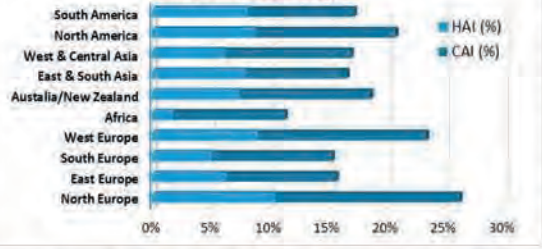

Table 1. Proportion (%) of adults patients with HA-PNEU versus CAP

UN Region/Indication	*N patients receiving AB syst. use (J01)*	*N AB (J01)*	CAI (%)	HAI (%)	Other (%)	Prevalence of type of HAI (out of all HAI): VAP (%)	HAP (%)	Other hosp (%)	LTCF (%)	ELSE (%)
North Europe	*786*	*1051*	60.3	39.7		2.9	84.7	3.5	6.4	2.6
East Europe	*98*	*121*	60.2	39.8		23.1	51.3			25.6
South Europe	*778*	*1014*	65.3	31.0	3.7	9.0	70.9	10.2	7.4	2.5
West Europe	*1962*	*2198*	61.8	38.1	2,0	9.7	68.6	4.7	15.8	1.2
Africa	*93*	*134*	84.9	15.1		42.9	35.7		7.1	14.3
Austalia/New Zealand	*184*	*267*	60.3	39.1	0.5	6.8	86.3	4.1	2.7	
East & South Asia	*876*	*1204*	52.6	46.3	1.0	15.0	67.4	3.4	12.0	1.3
West & Central Asia	*240*	*326*	63.3	35.8	0.8	30.7	45.5	1.1	18.2	4.5
North America	*451*	*674*	57.6	40.8	1.6	11.9	58.4	7.0	21.6	1.1
South America	*257*	*391*	52.9	47.1		21.0	69.4	4.8	1.6	3.2
Grand Total	*5725*	*7380*	60.3	38.8	0.9	11.6	69.2	4.8	11.9	2.5

HA-PNEU=hospital acquired infection; CAP=community acquired pneumonia; AB=antibiotics; VAP=intervention related pneumonia amongst them ventilator associated pneumonia; HAP=hospital acquired pneumonia; Other hosp=pneumonia acquired from other hospital; LTCF=pneumonia acquired from long term care facility; ELSE=any other HAI infection

With regards to **antibiotic quality indicators**, only 16.8% of antibiotics for PNEU were prescribed as targeted treatment. 1.4% of antibiotics targeted ESBL and 1.0% targeted other MDROs. Guidelines were most commonly missing in West & Central Asia. 82.6% of antibiotics were prescribed in compliance with local guidelines. Prescriptions in East and South Europe were least likely to have a documented reason for antibiotic prescription; and only 39.8% of antibiotics had a stop or review date documented. Details per region are provided in ***Table 4***.

Table 4. Quality indicators of antibiotic prescribing (J01) for PNEU (%)

Quality indicator (N antibiotics - J01)	North Europe % (n=1051)	East Europe % (n=121)	South Europe % (n=1014)	West Europe % (n=2198)	Africa % (n=134)	Austalia & New Zealand % (n=267)	East & South Asia % (n=1204)	West & Central Asia % (n=326)	North America % (n=674)	South America % (n=391)	All % (n=7380)
No guidelines	2.9	0	25.4	5.0	17.9	11.6	10.4	35.0	15.7	15.1	11.6
guideline compliant (yes)	83.9	88.4	79.7	83.7	60.6	70.8	88.7	65.9	87.8	70.6	82.6
Reason in notes (yes)	90.5	59.9	79.3	89.8	94.8	96.6	93.4	82.2	93.5	93.9	89.1
Stop review date (yes)	54.1	36.4	27.5	39.3	37.3	21.3	49.8	15.0	37.8	44.2	39.8
Targeted prescribing	6.1	23.1	14.7	21.8	23.9	15.0	16.9	20.6	10.5	27.4	16.8
Biomarker											
CRP	92.6	84.0	83.8	98.0	81.8	76.9	54.2	71.4	14.3	89.8	83.3
PCT	1.1	16.0	3.8	1.7			16.0		55.6	10.2	5.9

Biomarker: proportional results of CRP and PCT out of AB prescribing based on biomarker only

Biomarker data were used in the decision to prescribe 52% of all antibiotics for pneumonia, ranging from 64% in South Europe to 8% in Africa, and 63% of prescriptions based on biomarker data were for HAI-PNEU. CRP was more commonly used than PCT, regardless of region. In North America, PCT was used for 55.6% of prescriptions whereas in Europe, 93.1% of antibiotics based on biomarkers, were prescribed using CRP results (***Table 4***).

CONCLUSION

These data provide important insights in the management of pneumonia in adults worldwide. Almost 40% of patients with pneumonia worldwide are HAIs. There is a wide range of biomarker use in the management of pneumonia with overall low use of targeted treatment for these infections.

Disclosures: "**bioMérieux** is the sole sponsor of the GLOBAL Point Prevalence Survey. The funder has no role in study design, data collection, data analysis, data interpretation, or writing the report. Data are strictly confidential and stored anonymous at the coordinating centre of the University of Antwerp."

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The Global Point Prevalence Survey of Antimicrobial Consumption and Resistance (Global-PPS): a Worldwide Antimicrobial Web-based Point Prevalence Survey

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INTRODUCTION

Point Prevalence Surveys (PPS) are well established surveillance methods for monitoring antimicrobial prescribing in hospitals. The Global-PPS aimed to expand this method to monitor antimicrobial prescribing and resistance rates worldwide.

METHODS

This survey invited hospitals worldwide admitting adults, children and neonates, to volunteer to participate. Data collected included age, gender, weight, antimicrobial agents, doses, reasons and indications for treatment, microbiological data, compliance to guidelines, documentation of reasons and stop/review date of prescription. Denominators included the total number of inpatients. A web-based application is used for data-entry, validation and reporting. Time frame of data collection is from February until September 2015.

Figure 1. Geographical spread of the number of hospital sites who agreed participation to the study

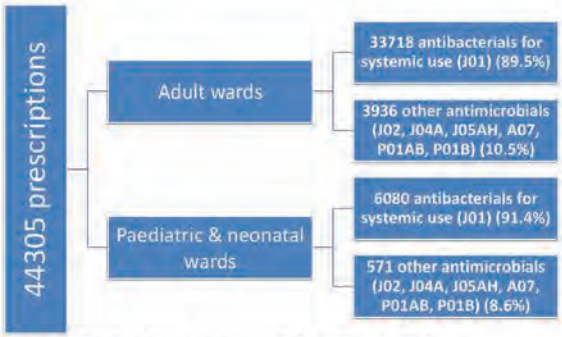

Figure 2. Number of recorded prescriptions (14 sept 2015)

RESULTS

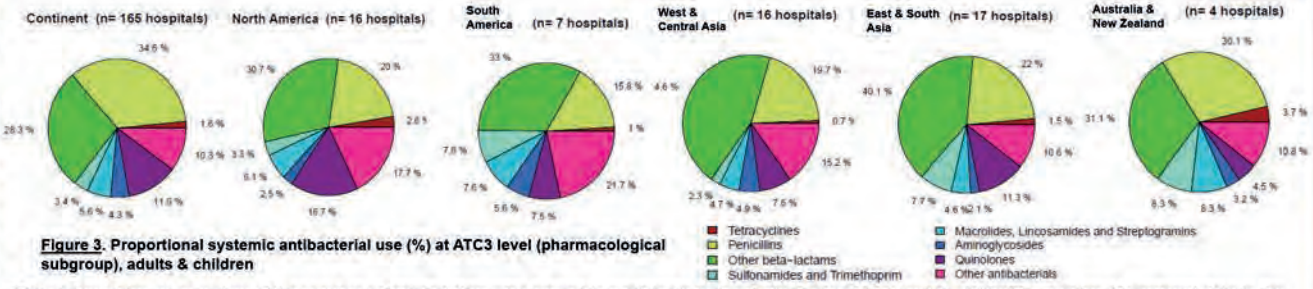

Figure 3. Proportional systemic antibacterial use (%) at ATC3 level (pharmacological subgroup), adults & children

Figure 1 provides an overview of the number of hospital sites who agreed to participate to the study. So far, 335 hospitals (H) in 53 countries (C) entered data in the Global-PPS program including Africa (5C, 12H), Asia (16C, 58H), Europe (24C, 210H), North-America (3C, 25H), South-America (3C, 21H) and Oceania (2C, 9H).

Out of in total 44305 recorded prescriptions, 89.8% were antibacterials for systemic use (ATC code J01), followed by antimycotics for systemic use (J02, 4.0%), drugs to treat tuberculosis (J04A, 2.3%), nitroimidazole derivatives (P01AB, 1.8%), intestinal anti-infectives (A07, 1.5%), neuraminidase inhibitors (J05AH, 0.3%) and antimalarials (P01B, 0.1%) (***Figure 2***). Considering validated data only at the date of September 14th 2015, highest overall antimicrobial prevalence rates (AMP) were observed for West & Central Asia (42.1%), followed by South America (39.5%), Australia and New Zealand (38.5%), North America (35.2%), East & South Asia (33.3%) and Europe (31.5%). Proportional systemic antibacterial use (%) at ATC3 level (pharmacological subgroup) varied considerably by continent (***Figure 3***). Prolonged surgical prophylaxis was most prevalent in West & Central Asia and lowest in North America (***Figure 4***). ***Table 1*** gives an overview of antibiotic quality indicators split up for the specialities medicine, surgery and intensive care at continental level.

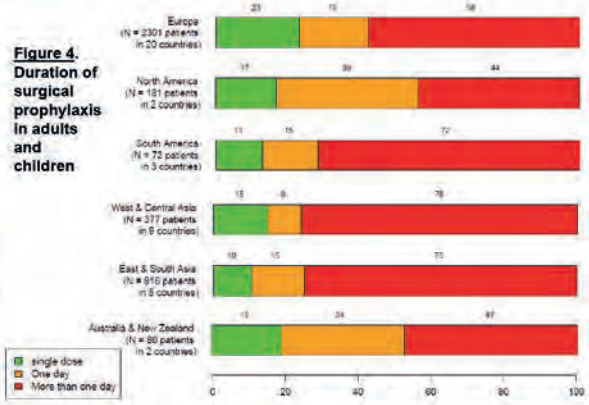

Figure 4. Duration of surgical prophylaxis in adults and children

Table 1. Summary of quality indicators for antibiotic use (%) by specialty and continent

QUALITY INDICATORS (%)	Europe	North America	South America	West & Central Asia	East & South Asia	Australia & New Zealand
Medical						
Reason in notes	78.5	90.2	86.0	**8.7**	81.4	84.2
Guidelines missing	12.7	4.5	6.2	37.1	17.8	8.4
Guideline compliant	79.3	86.2	77.8	75.0	84.6	76.3
stop/review date	37.1	61.7	30.5	17.3	48.3	24.2
Surgical						
Reason in notes	62.7	70.7	64.2	70.8	73.7	84.6
Guidelines missing	15.5	4.0	6.2	29.2	20.4	7.7
Guideline compliant	67.7	80.9	67.8	60.1	81.0	74.9
stop/review date	45.0	65.1	31.9	16.0	47.1	29.8
ICU						
Reason in notes	72.3	89.2	83.8	85.8	82.6	90.6
Guidelines missing	18.3	9.8	2.5	40.0	22.4	0.0
Guideline compliant	80.8	92.5	84.4	82.4	83.5	92.1
stop/review date	36.6	53.9	17.7	18.4	51.6	15.1

CONCLUSION

This ongoing Global-PPS demonstrated that worldwide surveillance can be accomplished with voluntary participation. It provides quantifiable outcome measures that is fed back to each centre comparing antimicrobial prescribing rates between participating centres, nations and continents. The Global-PPS allows for targeted quality improvements, the development of local prescribing guidelines, education and practice changes, and for measuring the impact of these interventions through repeated PPS.

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The Global Point Prevalence Survey of Antimicrobial Consumption and Resistance (Global-PPS): Results of Antimicrobial prescribing in Albanian hospitals.

Albania

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INTRODUCTION AND PURPOSE

Albania officially known as the Republic of Albania is a country in Southeastern Europe. It is bordered by Montenegro, Kosovo, Republic of Macedonia, and Greece. It has a coast on the Adriatic Sea and on the Ionian Sea. Albania has a total area of 28,748 km², with a population around 3 million.

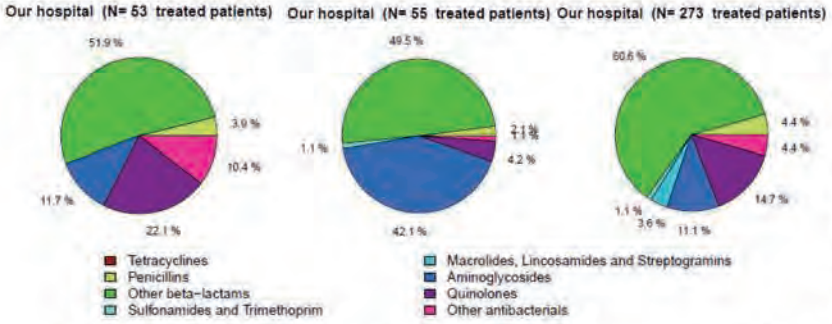
Antimicrobial resistance in Albania is one of the major health care problems, which is promoted by decades of unrestrictive antibiotic prescribing and use in healthcare and community setting. A uniform and standardized method for surveillance of antimicrobial use in hospitals was used to assess the variation in antimicrobial prescribing in Albania. This methodology is a well-established surveillance method for monitoring antimicrobial prescribing in hospitals.

METHODS

PPS was conducted in January - July 2015, in 3 Albanian hospitals. The survey included all inpatients receiving an antimicrobial on the day of PPS. Data collected included age, gender, weight, antimicrobial agents, doses, reasons and indications for treatment, microbiological data, compliance to guidelines, documentation of reasons and stop/review date of prescription. Denominators included the total number of inpatients. A web-based application is used for data-entry, validation and reporting as designed by the University of Antwerp (www.global-pps.com).

RESULTS

Figure 1. Overall proportional antibiotic use in 3 Albanian hospitals



Three hospitals participated: University Hospital Centre "Mother Theresa" in Tirana (UHC), University Hospital of Trauma (UHT), in Tirana and Vlora Hospital (VH) (Regional Hospital) in Vlora. The PPS included 804 patients admitted to 31 wards (mainly adult wards; 84.7%). Only antibiotics for systemic use (ATC J01) have been reported. Overall antibiotic prevalence rate was 47.4% with highest rates observed in VH 83.3%, followed by UHT 56.1% and UHC 38.5%. Out of 533 antibiotics, 22.3% was for a community acquired infection, 14.3% for a hospital acquired infection and 50.1% for prophylactic use (mainly surgical prophylaxis: 70.8%). The most common diagnosis to be treated with therapeutic antibiotics are provided in ***Table 1***. ***Figure 1*** provides proportional prevalence rates for the 3 hospitals. Top three antibiotics for therapeutic use were ceftriaxone (28.2%) mainly for pneumonia (20.0%) beside several other reasons, cefazolin (23.1%) mainly prescribed for bronchitis and upper urinary tract infections (44.4%) and ciprofloxacin (14.4%). For surgical prophylaxis, mainly cefazolin was prescribed (26.6%), often in combination with gentamicin. Overall, prolonged surgical prophylaxis (more than one day) was very common (in 96.8% of prescriptions) (***Figure 2***). An overview of antibiotic quality indicators is provided in ***Table 2***. The reason of the prescription was commonly documented (91.7%), but a stop/review date was nearly absent for all prescriptions (99.1%). Overall, antibiotic guidelines were not available. Nearly all antibiotics were empirically administered (98.9%).

Table 1. Ten most common diagnoses to be treated with therapeutic antibiotics

Diagnosis	N	%
Pneumonia or lower respiratory tract infection	101	27.1
Bronchitis	76	20.4
Upper urinary tract infection	15	4.0
Pyrexia of unknown origin	14	3.8
Cardiovascular system infections	10	2.7
Lower urinary tract infection	16	4.3
Upper respiratory tract infection	9	2.4
Infection central nervous system	5	1.3
Gastro-intestinal infections	11	2.9
Intra-abdominal sepsis	9	2.4

Figure 2. Duration of surgical prophylaxis in 3 Albanian hospitals

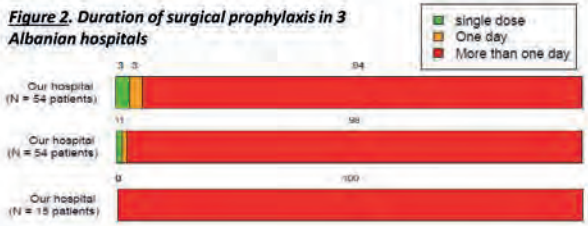


Table 2. Quality indicators for antibiotic use

	Medical (%)	Surgical (%)	ICU (%)
Reason written in notes	88.1	100	95.8
Stop/review date	0.6	0	1.4
Guidelines missing	100	100	100
Parenteral use	93.9	97.5	97.2
Targeted treatment	0.9	2.5	0

CONCLUSION

The reported high antibiotic prescribing rates might be attributed to the lack of guidelines and absence of continuous monitoring of antibiotic agents. Global PPS was an excellent experience to value the current situation of antibiotic consumption in Albania. We aim to repeat this survey in 2016 and will include as much as possible hospitals to obtain a more representative picture of AM prescribing in Albania. This will also give us an opportunity to initiate antibiotic stewardship initiatives and monitor their outcome.

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Australia

MonashHealth

TheAlfred

The Global Point Prevalence Survey of Antimicrobial Consumption and Resistance (Global-PPS): Antimicrobial prescribing in Australian Hospitals

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INTRODUCTION AND PURPOSE

A standardized method for antimicrobial use surveillance in hospitals was used to assess antimicrobial prescribing in Australia in a pilot study. Australia is a country of 24 million people. The hospitals are based in Melbourne and Sydney, the two largest cities. Monash Health is a large network of hospitals with 1417 beds. Five hospitals from this network have contributed to the study. The Alfred Hospital and Concord Hospital are both 450 bed teaching hospitals.

All Australian hospitals are required to have an antimicrobial stewardship programme, and hospitals are also encouraged to participate in the National Antimicrobial Prescribing Survey (NAPS), and National Antimicrobial Utilization Surveillance Program (NAUSP). There are also widely available extensive national antibiotic guidelines. The Global-PPS allows comparison of use in regions including ours.

METHODS

A point prevalence survey (PPS) was conducted in 2015, in 7 metropolitan hospitals in Melbourne and Sydney. All are teaching hospitals. The PPS was conducted in the acute and subacute beds, including both adult and paediatric patients. The survey included all inpatients receiving an antimicrobial on the day of PPS. Data collected included age, gender, weight, antimicrobial agents, doses, reasons and indications for treatment, microbiological data, compliance to guidelines, documentation of indication for antimicrobial use and anticipated stop/review date. Denominators included the total number of inpatients. A web-based application was used for data-entry, validation and reporting as designed by the University of Antwerp (www.global-pps.com).

RESULTS

Of the 2012 patients surveyed in 139 different wards in 7 participating hospitals, 771 (38%) were being administered ≥1 antimicrobial agents on the day of the survey (total prescriptions 1219 antimicrobials). Paediatric patients were 10% of the cohort sampled, and accounted for 10% of the antimicrobial use. The percentage of patients on antimicrobials in each hospital ranged from 15-62%. Figure 1 shows the indications for antimicrobials use, both adult and paediatric data combined. Overall the most commonly treated infections were pneumonia (no of prescriptions=206; 17%), skin/soft tissue infection (n=147; 12%) and intra-abdominal sepsis (n=113; 9%).

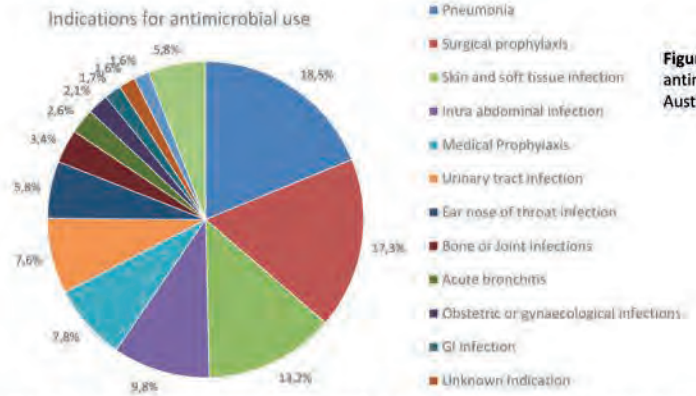

Figure 1. Indications for antimicrobial use in Australian hospitals.

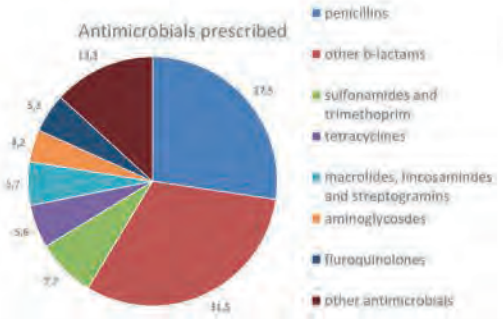

Figure 2. Antimicrobials used in Australian hospitals

The prevalence of antimicrobial prescriptions involving penicillins (28%), other beta-lactams (32%) were similar to the prevalence in European hospitals (33% and 29% respectively) but quinolone use (5%) was lower than in European hospitals (12%). Similarly, the proportion of BL/BLI of penicillin prescriptions (53%) and third generation cephalosporins as a proportion of other beta-lactams (40%) were lower than in European hospitals (70% and 45% respectively, see Figure 2).

Quality indicators were similar to those reported in European hospitals, with 85% having a documented indication; and 61% being guideline compliant, but a stop/review date only documented in 28%.

References

1. Australian Commission on Safety and Quality in Health Care (2015). Antimicrobial prescribing practice in Australian hospitals: results of the 2014 National Antimicrobial Prescribing Survey , ACSQHC, Sydney
2. Australian Commission on Safety and Quality in Health Care (2015). Antimicrobial use in Australian hospitals: 2014 report of the National Antimicrobial Utilisation Surveillance Program, ACSQHC, Sydney

CONCLUSION

The global point prevalence survey complements data from NAPS and NAUSP. The NAPS data from 2014 showed surgical prophylaxis was the primary indication for antimicrobials use (13.1%), followed by community acquired pneumonia (11.3%) and medical prophylaxis (8.3%)[1]. The NAUSP data from 2014 demonstrated that b-lactamase inhibitor combinations were the most widely used antibiotics in Australian hospitals (180.7 DDD per 1000 occupied bed days) followed by first generation cephalosporins (130.9 DDD per 1000 occupied bed days).

Although the Global-PPS data is only from a small number of Australian participating hospitals, the overall prevalence of antimicrobial use was similar to those described in Europe, but with differences in the agents prescribed reflecting differences in national prescribing guidelines. Participation of a larger number of Australian hospitals will provide additional detail on the comparative epidemiology of antimicrobial use in Australia compared to other countries and regions of the world.

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Belgium

BAPCOC

The Global Point Prevalence Survey of Antimicrobial Consumption and Resistance (Global-PPS) in 100 Belgian hospital sites

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INTRODUCTION AND PURPOSE

The 2014-2019 policy plan of the Belgian Antibiotic Policy Coordination Committee (BAPCOC) determined that the antibiotic policy groups, in place in all Belgian hospitals, need to work on major national topics to improve antibiotic prescribing practices. In particular, Belgian hospitals need to continuously monitor four defined quality indicators (QI): 1) choice of therapeutic antibiotics, 2) indication statement of antibiotic therapy in the medical record, 3) choice and 4) duration of surgical antibiotic prophylaxis following local instructions.
By means of the Global-PPS, we aimed to determine the variation in quantity and quality of antibiotic prescribing in adults and children admitted to the Belgian hospitals; and to identify targets for improvement according to the Belgian policy plan.

METHODS

Data were collected in 100 Belgian hospital-sites in February-June 2015 using the standardized and validated method. Detailed data was collected for all inpatients receiving at least one antimicrobial treatment on the day of the survey. Detailed patient data was mandatory and completely anonymously entered online using a web-based tool for data-entry, validation and reporting as designed by the University of Antwerp (www.global-pps.com). Denominator included all admitted inpatients, collected at ward level.

RESULTS

Out of 102 Belgian hospital entities, 69 (68%) participated to the Global-PPS; covering in total 100 hospital sites. Seven out of 9 Belgian tertiary care hospitals participated. Data included 26,346 patients admitted to 1,539 wards, of which 70.7% admitted in secondary care and 13.4% in tertiary care hospitals. Overall antimicrobial prevalence rate was 27.4% and differed considerably by hospital type (***see Table 1***) and between hospitals (***Figure 1***). Among all recorded antimicrobials (n=8,802); antibiotics, antifungals and anti-tuberculosis drugs represented 90.2%, 4.9% and 2.1%, respectively. Out of 7,942 antibiotics, 82.0% were prescribed for treatment and 15.3% for medical or surgical prophylaxis.

Table 1. Antimicrobial prevalence rates (%) by type of hospital

Hospital type (n=hospital sites)	N Beds	N Patients	N treated patients	%	Range (%)
Primary (n=23)	5526	4199	999	23.8%	3.3-51.8
Secondary (n=70)	23972	18616	5047	27.1%	6.0-45.6
Tertiary (n=7)	4401	3531	1161	32.9%	26.2-38.2
Total	**33899**	**26346**	**7207**	**27.4%**	**3.3-51.8**

Figure 1. Variation in antimicrobial prevalence rates (%) in Belgian hospitals

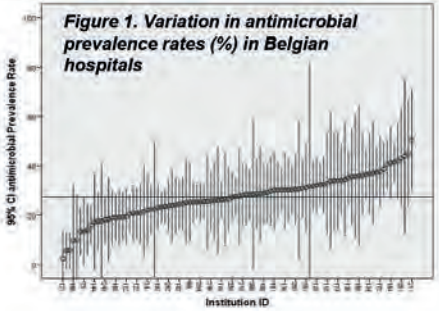

Figure 2. Variation in duration of surgical prophylaxis (%)

Table 2. Top 10 prescribed antibiotics for therapeutic and surgical prophylactic use

	Therapeutic All (%)	CAI (%)	HAI (%)		Surgical proph (%)
Co-amoxiclav	30.4	36.3	19.0	Cefazolin	62.6
Piperacillin/Tazo	10.3	7.9	14.9	Co-amoxiclav	10.3
Ciprofloxacin	7.2	6.4	8.6	Cefuroxime	5.0
Ceftriaxone	4.8	4.8	4.9	Ciprofloxacin	3.4
Moxifloxacin	4.5	5.4	2.6	Clindamycin	3.3
Meropenem	4.3	2.5	7.9	Metronidazole	2.7
Levofloxacin	3.7	3.4	4.4	Levofloxacin	1.5
Cefuroxime	3.7	3.5	3.9	Ornidazole	1.5
Vancomycin	3.2	1.7	6.1	Nifurtoinol	1.3
Amoxicillin	3.2	3.8	2.0	Cefadroxil	1.2

Table 3. Prevalence rates of QI of antibiotic prescribing by indication

	Medical (%)	Surgical (%)	ICU (%)
Reason in notes	81.5	73.2	89.6
Guidelines missing	9.7	8.5	7.3
Guideline compliant	80.3	74.2	83.3
Stop/review date documented	34.9	46.8	34.6
Parenteral administration	58.9	71.2	93.3
Targeted therapie	26.9	22.2	35.6

Overall, quinolones represented 14.0% (range: 4.3%-42.1%) of all antibiotic prescriptions, mostly ciprofloxacin (mainly for urinary tract infections) and moxifloxacin (mainly for lower respiratory tract infections). Amoxicillin accounted for only 3.0% of all antibiotic prescriptions. ***Table 2*** shows details of the top 10 antibiotics prescribed for therapeutic and surgical prophylactic use.
7.9% of patients (range: 4.5%-16.4%) were treated for a healthcare associated infection (HAI) of which most related to non-intervention associated infections (49.3%), followed by surgical site infections (18.8%) and infections originating from long term care facilities (11.5%). Prolonged surgical prophylaxis (>1day) ranged from 0-87% (mean=28%) (***Figure 2***). Details on antibiotic quality indicators are shown in ***Table 3***. In general, the documentation of a stop/review date was low.

CONCLUSION

We identified several targets to improve antibiotic prescribing in Belgium: number of patients with HAI, high levels of quinolone (moxifloxacin) and co-amoxiclav prescribing, the improvement of recording the reason and the follow-up of the antibiotic prescription (stop/review date) in notes. We aim to implement policy actions which need to be obtained at national and hospital level; and to include all Belgian hospitals for the next survey in 2016. Hospitals will receive support to implement interventions to improve quantitative and qualitative antibiotic prescribing.

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CHILE

The Global Point Prevalence Survey of Antimicrobial Consumption and Resistance (Global-PPS): First results of antimicrobial prescribing in 12 Chilean Hospitals.

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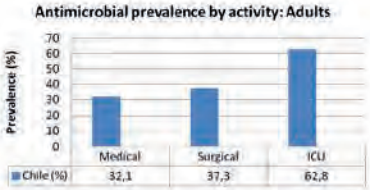
INTRODUCTION AND PURPOSE

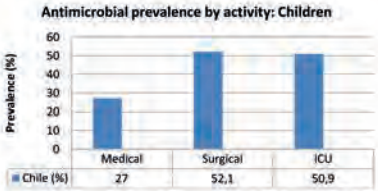
Information related to antimicrobial prescribing is critical for the implementation of antibiotic stewardship program. So far, there is no information of antibiotic prescribing in Chile. We applied a uniform and standardized method for surveillance of antimicrobial use (Global-PPS) in 12 Chilean hospitals. The aim of this study was to asses variation of antimicrobial prescribing in 12 Chilean hospitals.

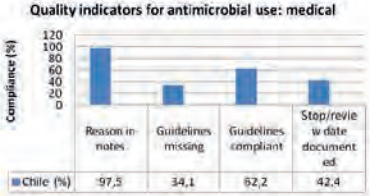
METHODS

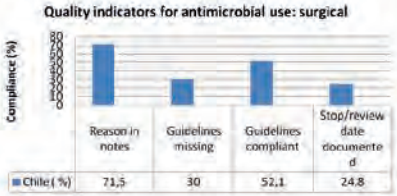
PPS was conducted from March through May 2015, in 12 chilean tertiary care hospitals. The survey included all inpatients receiving an antimicrobial (AM) on the day of PPS. Data collected included age, gender, weight, antimicrobial agents, doses, reasons and indications for treatment, microbiological data, and quality indicators. Denominators included the total number of inpatients. A web-based application is used for data-entry, validation and reporting as designed by the University of Antwerp (www.global-pps.com).

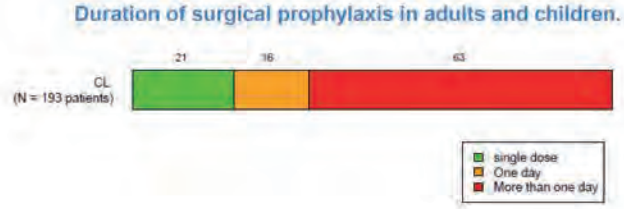
RESULTS











The PPS included 3043 patients of which 2504 admitted in adult wards, 304 in paediatric wards, and 235 in neonatal wards. Overall AM prescribing was 35.9%. Overall AM use was highest in children (37.5%), followed by adults (36.9%) and neonates (23.0%). In adult wards the prevalence of AM use ranged from 31.9% in medical wards to 62.8% in ICU. Compared with Europe, Chilean hospitals used more non penicillin beta-lactam antibiotics (39% vs 29%), more 3rd generation cephalosporins (47% v/s 40%) and carbapenems in intensive care units (40% vs 28%). The top 5 antibiotics (ATC code J01) prescribed in Chile were ceftriaxone (18.2%) mainly prescribed for community acquired pneumonia and intrabdominal infections, metronidazole (10.8%) mainly in combination with ceftriaxone (61.0% of cases), cefazolin (8.7%) mainly for prophylactic use, vancomycin (8.2%) mainly prescribed for a nosocomial pneumonia; and ciprofloxacin (4.8%), mainly for treatment or prophylaxis of urinary tract infections (39.0%).

Reason for AM prescribing was documented in clinical charts in 90% in medical wards, 70% in surgical wards and 90% in the ICU. A stop review date was written in the notes in 38% of all antibiotic prescriptions (range: 3.6%-74.1%). Overall, guidelines were missing in 28.7% (range: 0% to 95%). Compliance with guidelines was lowest in intensive care units (54%). Prolonged prophylaxis prescribing (> 24 hours) was very common (63.4%, range 33.3% to 85.1%).

In community acquired infections 25% of antibiotic treatments were targeted, while in hospital acquired infections were 43%. Out of all targeted treatments 17% of the patients got an antibiotic prescribed against a multi drug resistant microorganism (MDRO) which is more than twice as high compared to Europe (6.8%). The presence of an extended spectrum beta-lactamase (ESBL) was the most common cause (7%) in Chile.

CONCLUSION

This Global-PPS for the first time evaluated antimicrobial prescribing in Chilean hospitals. AM rates are high but vary a lot among hospitals. Treatment directed to MDRO is frequent. We disclosed following areas to improve antibiotic prescribing: absence of and compliance with guidelines, low reporting of a stop/review date in the medical files and prolonged surgical prophylaxis.

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Israel

The Global Point Prevalence Survey of Antimicrobial Consumption and Resistance (Global-PPS): First results of antimicrobial prescribing in Israeli hospitals

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INTRODUCTION AND PURPOSE

- Antibiotic resistance is a major problem in Israeli hospitals.
- Antibiotic resistance is associated with morbidity, mortality and increased costs.
- Various methods have been proposed to reduce resistance rates. These include infection control measures, antibiotic stewardship and implementing treatment guidelines.
- Little information is available regarding variation in antibiotic prescription in Israel.
- The aim of this study was to assess variation in antibiotic prescription in Israeli hospitals by using a uniform standardized method as part of the Global-PPS.

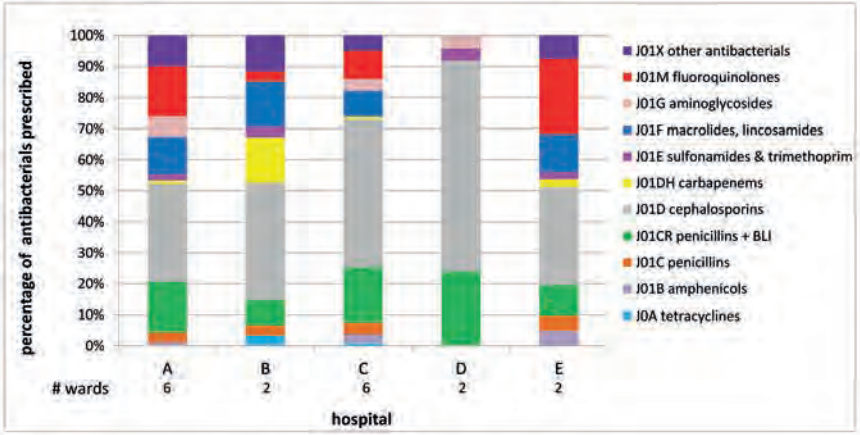
METHODS

PPS was conducted on a single day in each participating ward in 5 of Israel's 28 general hospitals during March-July 2015. The survey included all inpatients receiving an antimicrobial on the day of PPS. Data collected included age, sex, weight, antimicrobial agents, doses, reasons and indications for treatment, microbiological data, compliance with hospital guidelines, documentation of reasons and documentation of a stop/review date. Denominators were the total number of inpatients. A web-based application was used for data entry, validation and reporting as designed by the University of Antwerp (www.global-pps.com).

RESULTS

- Forty-seven adult wards with 1373 patients were surveyed. Overall antimicrobial prevalence was 36% and ranged by ward from 0% to 79%.
- Among the 497 patients on antimicrobials, 67% were treated with a single agent, 27% with 2 agents, and 6% with 3 or more.
- The 3 most commonly used agents were ceftriaxone (15% of the 694 antimicrobials prescribed), ciprofloxacin (11%), and metronidazole (10%). Penicillins with beta-lactamase inhibitors (15% of the 694 antimicrobials prescribed) and third-generation cephalosporins (15%) were the most commonly used antimicrobial groups. The distribution of antibacterial groups prescribed differed between hospitals, most notably for carbapenems and fluoroquinolones (Figure).

Figure. Distribution of antibacterials (ATC group J01) prescribed, by hospital, adult internal medicine wards, Israel, 2015



- The 3 most common indications for antimicrobial use were pneumonia (21% of the 694 antimicrobials prescribed), intra-abdominal sepsis (13%), and skin and soft tissue infections, including surgical site infections (10%).
- Eighty-five percent of antimicrobials were prescribed for therapeutic use, 12% for prophylaxis and 2% for unknown/other reasons.
- Of the 593 drugs prescribed for therapeutic use, 67% were for community-acquired infections, 24% were for infections acquired in the treating hospital, and 9% were for infections acquired in the nursing homes or long-term care facilities from which patients had been transferred.
- Eighty percent of agents were chosen empirically and 20% were based on culture results.
- Sixty-eight percent of antimicrobials were given parenterally and 32% orally.
- Quality indicators:
  - Compliance with treatment guidelines could be assessed for 472 agents (68%); of these, 71% were prescribed according to the hospital's guidelines.
  - For 12% of antimicrobials, no reason for their use was documented in the chart.
  - Documentation of length of treatment (stop/review date) varied greatly between institutions (2%-81%).

CONCLUSION

- Prevalence of antimicrobial use in Israel is similar to that reported in the European point prevalence survey conducted in 2011-12.
- Compared to that survey, the proportion of drugs prescribed to treat hospital-acquired infections was significantly higher in Israel.
- Further study is warranted to assess whether interventions, such as specifying treatment duration to limit unnecessarily prolonged use of antimicrobials and implementing treatment guidelines, impact antibiotic resistance rates and outcomes of patients in Israeli hospitals.

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Japan

The Global Point Prevalence Survey of Antimicrobial Consumption and Resistance (Global-PPS): Results on Antimicrobial Prescriptions in Japanese Hospitals

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INTRODUCTION AND PURPOSE

Antimicrobial resistant bacteria are a pressing concern in Japan. Antimicrobial stewardship is considered one of the important measures to control resistant bacteria. Surveillance of antimicrobial use is necessary for achieving this but no official surveillance system of antimicrobial use exists in Japan.
The aim of this study was to assess antimicrobial prescribing for adults and children admitted to Japanese hospitals by means of Global-PPS, and to identify targets for improvement of antimicrobial use in Japan.

METHODS

A voluntary point prevalence survey (PPS) of hospitals in Japan was conducted in 2015. The survey included all inpatients receiving an antimicrobial agent on the day of the PPS. Data collected included age, sex, weight, antimicrobial agents, doses, reasons and indications for treatment, microbiological data, compliance with guidelines, and documentation of indications and stop/review date of the prescription. Denominators included the total number of inpatients. A web-based application designed by the University of Antwerp (www.global-pps.com) was used for data entry, validation, and reporting.

RESULTS

The survey covered 18 Japanese hospitals. The antimicrobial prevalence rate was 29.5% (**Table 1**). Antimicrobial rates between wards varied from 8.6% (neonatal ward) to 83.2% (adult transplant ward). Among 3,381 antimicrobials used, 53.8% were prescribed for treatment and 42.6% for prophylaxis. The main indications for antimicrobial use were medical prophylaxis (26.2%), community-acquired infection (22.0%), non-intervention-related hospital-acquired infection (19.3%), and surgical prophylaxis (16.3%). Among 1,484 treated patients, 58.0% was HAI. The most prescribed antibiotic group was J01D (other beta-lactam antibacterials, which includes cephalosporins and carbapenems; 36.1%). Although the top 3 antibiotics used were sulfamethoxazole and trimethoprim (10.8%), cefazolin (8.6%), and piperacillin and enzyme inhibitor (6.2%), the patterns of antibiotic use were different among indications (**Table 2, 3**). Among surgical prophylactic antimicrobials, 75.9% were prescribed for more than one day (**Figure 1**). Details on antibiotic quality indicators are shown in **Table 4**.

Table 1. Antimicrobial prevalence rates (%) by type of hospital

Type of hospital	Number of patients	Number of treated patients	Antimicrobial prevalence rates
Secondary (n=7)	1698	525	30.9%
Tertiary (n=6)	4860	1344	27.7%
Paediatrics (n=2)	543	125	23.0%
Specialized hospital (n=3)	1692	596	35.2%
Total (n=18)	**8793**	**2590**	**29.5%**

Table 2. Top 5 antibiotics for therapeutic use

Community acquired infection		Hospital acquired infection	
Ampicillin and enzyme inhibitor	11.6%	Piperacillin and enzyme inhibitor	12.5%
Ceftriaxone	10.0%	Vancomycin	10.1%
Piperacillin and enzyme inhibitor	7.1%	Meropenem	7.4%
Ampicillin	5.8%	Ampicillin and enzyme inhibitor	7.0%
Meropenem	5.4%	Cefepime	6.1%

Table 3. Top 5 antibiotics for prophylactic use

Medical prophylaxis		Surgical prophylaxis	
Sulfamethoxazole and trimethoprim	45.1%	Cefazolin	38.2%
Fluconazole	13.3%	Cefcapene	10.9%
Levofloxacin	7.1%	Cefmetazole	8.9%
Itraconazole	7.0%	Cefditoren	6.3%
Voriconazole	4.5%	Cefotiam	5.3%

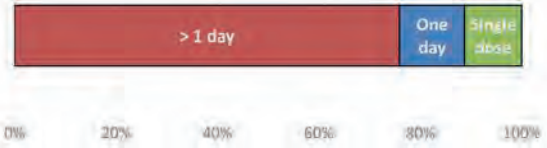

Figure 1. Duration of surgical prophylaxis

Table 4. Quality indicators of antibiotic use

	Yes
Reason in notes	61.8%
Guideline compliant	60.7%
Stop/review date documented	27.3%
Targeted prescribing	30.2%

CONCLUSION

We identified some characteristics of antimicrobial prescribing in Japan through this PPS: higher use of J01D (cephalosporins and carbapenems), longer antibiotic use for surgical prophylaxis than expected, and low level of quality indicators. This findings indicate that local data are necessary for hospitals and public health centers in order to increase the impact of antimicrobial stewardship programs and campaigns in Japan.
This survey was the first PPS of antimicrobial prescription in multiple Japanese hospitals and provides basic information for designing efficient antimicrobial stewardship programs. Repeated surveys are important to promote antimicrobial surveillance and appropriate use in the future.

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Republic of Kosovo

The Global Point Prevalence Survey of Antimicrobial Consumption and Resistance (Global-PPS): Results of Antimicrobial prescribing in Kosovo hospitals

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INTRODUCTION AND PURPOSE

Kosovo is located in southeastern Europe in Balkan region with a population around 2 million in an area of 10,908 km². There is no health insurance established yet and health care system faces many obstacles. Antimicrobial resistance in Kosovo is one of the major health care problems, which is promoted by decades of unrestrictive antibiotic prescribing and use in healthcare and community setting.

By means of the Global-PPS, we aimed to determine the variation in quantity and quality of antibiotic prescribing in adults and children admitted in Kosovo hospitals; and to identify targets for improvement to help hospitals in designing interventions that aim prudent antibiotic use.

METHODS

PPS was conducted in June-July 2015, in 6 regional hospitals and one teaching hospital in Kosovo. The survey included all inpatients receiving an antimicrobial on the day of PPS. Data collected included age, gender, weight, antimicrobial agents, doses, reasons and indications for treatment, microbiological data, compliance to guidelines, documentation of reasons and stop/review date of prescription. Denominators included the total number of inpatients. A web-based application was used for data-entry, validation and reporting as designed by the University of Antwerp (www.global-pps.com).

RESULTS

A total number of 1748 patients from 189 wards were surveyed, out of which 688 (39.3%) received at last one antibiotic during hospital stay (**Table 1**). Hospital bed occupancy was 52.2%; 38.4% adults, 58.3% children and 30.9% neonates were treated with antibiotics. Top 3 antibacterial subgroups (ATC level 3) were other beta-lactam antibacterials (J01D) 47.6%, followed by antituberculotic drugs (J04A) 15.9% and aminoglycosides (J01G) 13.7% (**Figure 1**). Ceftriaxone was the most prescribed antibiotic (31.8%), mainly prescribed for CAI and surgical prophylaxis (44.5% vs. 39.7%), followed by cefazolin (10.7%) mainly prescribed for prophylaxis (83.3%) and gentamicin (9.7%) also mainly prescribed for prophylaxis 67%. 93.4% of patients received parenteral antibiotics for systemic use (J01 – excluded NMW and NICU patients).

Table 1. Antimicrobial prevalence rates (%) by hospital

Hospital	N Patients	N treated patients	%	% of bed occupancy
UCCK	933	325	34.8	63.6
Prizren	232	109	47.0	52.0
Peja	156	88	56.4	43.6
Gjilan	169	72	42.6	41.2
Gjakova	190	66	34.7	45.1
Ferizaj	24	11	45.8	24.2
Mitrovica	44	17	38.6	30.1
Total	1748	688	39.3	52.2

Table 2. Quality indicators of antibiotic prescribing

	Medical (%)	Surgical (%)	ICU (%)
Reason in notes	85.9	99.7	96.8
Guidelines missing	97.3	99.7	100
Guideline compliant	100	0	0
Stop/review date documented	2.4	5	3.2

Figure 1. Proportional antimicrobial use in Kosovo hospitals

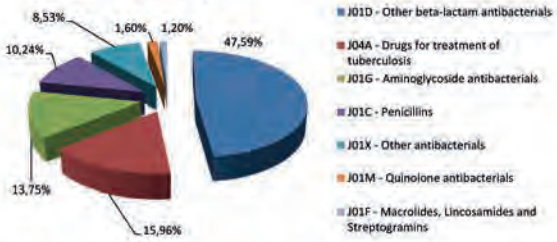
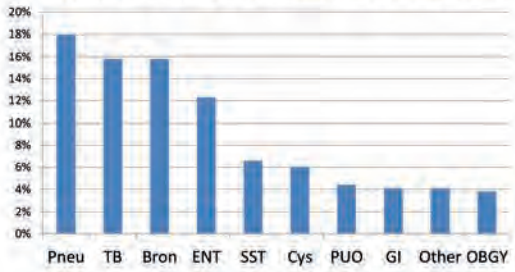


Figure 2. Top 10 diagnoses treated with antimicrobials



Empiric prescribing was the main physician choice for prescribing (88.4%). The main reason for treatment with an antibiotic was pneumonia (18%), tuberculosis (15.8%) and bronchitis (15.8%) (**Figure 2**). **Table 2** shows quality indicators of antibiotic prescribing. 92.3% of prescriptions were for CAI (58.9% empirical vs. 41.1% targeted) and 7.7% for HAI (82.1% empirical vs. 17.9% targeted). Surgical prophylactic prescribing was 80.3% and medical prophylaxis 19.7%. Duration of prophylactic treatment was more than one day in all recorded cases. Antimicrobial susceptibility results were collected from 298 isolates from blood and cerebrospinal fluid in 7 public laboratories. In Enterobacteriaceae, 88% of *K. pneumoniae* isolates were resistant to 3rd generation cephalosporines . Resistance levels in *Acinetobacter spp.* to carbapenems was 92%, whereas 38% of *S. aureus* were MRSA.

CONCLUSION

Antimicrobial prescribing is very high in Kosovo hospitals, especially cephalosporins, with antimicrobial susceptibility results showing high resistance to 3rd generation cephalosporins. Protocols for treatment and prophylaxis do not exist. Gathered data will be an important tool to identify targets for quality improvement in Kosovo and will support the preparation of guidelines and protocols for prudent use of antibiotics. A working group by the Ministry of Health is already established with a mandate to prepare restrictions in usage of antibiotics in all levels of health care.

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The Netherlands

The Global Point Prevalence Survey of Antimicrobial Consumption and Resistance (Global-PPS): Results of antimicrobial prescribing in Dutch hospitals

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INTRODUCTION AND PURPOSE

The Netherlands is located in Europe and has a population of approximately 16,9 million. Antibiotic consumption and resistance in the Netherlands remains low compared to other European countries.

A uniform and standardized method for surveillance of antimicrobial use in hospitals was used to assess the variation in antimicrobial (AM) prescribing in the Netherlands.

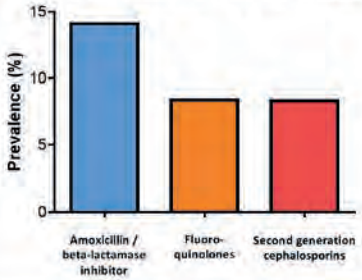
METHODS

PPS was conducted between October 2014 and July 2015 in 2 general, 5 teaching and 1 university hospital in the Netherlands. The survey included all inpatients receiving an antimicrobial on the day of PPS. Data collected included age, gender, weight, antimicrobial agents, doses, reasons and indications for treatment, microbiological data, compliance to guidelines, documentation of reasons and stop/review date of prescription. Denominators included the total number of inpatients. For data-entry, validation and reporting a web-based application was used as designed by the University of Antwerp (www.global-pps.com).

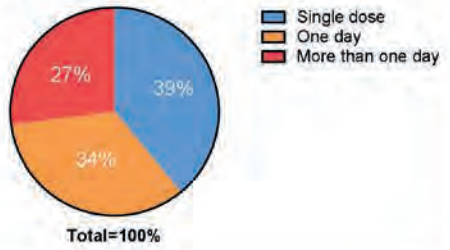
RESULTS

During the PPS a total of 2364 patients were admitted to 191 different wards. The total AM prevalence rate was 33% (782/2364) with the highest prevalence rate on the paediatric intensive care units (62.5%) followed by the haematology-oncology adult ward (57.3%) and the haematology-oncology paediatric ward (55,5%). The top three most reported indications for AM use were pneumonia/lower respiratory tract infections (18,1%), medical prophylaxis (12.3%) and intra-abdominal sepsis (7.9%). The three most frequently used AM were amoxicillin/clavulanic acid (8,4%), cefuroxime (8,3%) and cefazolin (8%). The most common types of AM used were amoxicillin with beta-lactamase inhibitors (14.1%), fluoroquinolones (8.4%) and second-generation cephalosporins (8.3%). Most AM were prescribed for community acquired infections (45.6%) followed by hospital acquired infections (17.1%). In total, 33% of AM prescriptions were prophylactic, consisting of 43% surgical prophylaxis and 57% medical prophylaxis. The duration of the surgical prophylaxis was a single dose in 39%, one day in 34% and more than one day in 27% of the prescriptions. Overall, 29.4% of patients got a targeted treatment, among which 3.4% received an antibiotic targeting a multidrug resistant organism. An ESBL-producing Enterobacteriaceae was the most often reported cause (1.6%). From the antibiotic use quality indicators, the reason to start an AM was registered in 87% of prescriptions. Compliance to the guidelines was observed in 74% of the cases and non-compliance in 17% (in 9% it was not assessable). The stop date was registered in 54% of the prescriptions.

Most common types of antimicrobials



Duration of surgical prophylaxis



CONCLUSION

This survey on antibiotic use was successfully conducted in 8 hospitals in the Netherlands. The first results indicate a 33% prevalence of AM with beta-lactams and fluoroquinolones being the most frequently used groups. Compliance to guidelines was relatively high (74%). The duration of surgical prophylaxis was more than one dose in the majority of cases, which seems the most important target for improvement of the quality of antimicrobial use. The results of the PPS can be used as a foundation for future antibiotic stewardship interventions.

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Nigeria

The Global Point Prevalence Survey of Antimicrobial Consumption and Resistance (Global-PPS): First Results of antimicrobial prescribing in Nigerian Hospitals

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INTRODUCTION AND PURPOSE

Antibiotic stewardship has been shown to improve patient outcomes and decrease healthcare costs while reducing the burden of antibiotic resistance. This intervention is vital in developing countries like Nigeria but will require knowledge of current antibiotic prescribing practice which is currently lacking. To obtain baseline information for antibiotic stewardship, a uniform and standardized method for surveillance of antibiotic use in hospitals was used to assess the antimicrobial prescribing practices in the North Central, North West and South West regions of Nigeria.

METHODS

A Point Prevalence Survey (PPS) was conducted in April 2015, in four Nigerian tertiary hospitals. The survey included all inpatients receiving an antibiotic on the day of PPS. Data collected included age, gender, weight, antibiotics, doses and indication for treatment, microbiological data, compliance to guidelines, and stop/review date of prescription. Denominators included the total number of inpatients. A web-based application was used for data-entry, validation and reporting as designed by the University of Antwerp (www.global-pps.com).

RESULTS

The survey included 828 patients admitted on a total of 77 wards of which 577 (69.7%) received at least one antimicrobial on the day of the PPS. Highest antimicrbial prevalence rates were in adult intensive care units (ICU) (88.9%) followed by paediatric medical wards (84.6%) and neonatal ICU (76.7%). ***Figure 1*** *shows the d*istribution of antimicrobial use by wards. Out of 1023 administered doses of antimicrobials, those for systemic use accounted for 85.6% of prescriptions, followed by nitroimidazole derivatives (7.5%) and drugs to treat tuberculosis (2.4%). ***Table 1*** shows the top 10 antibiotics prescribed for therapeutic and prophylactic use.

Figure 1. Antimicrobial use prevalence rates (%) by wards

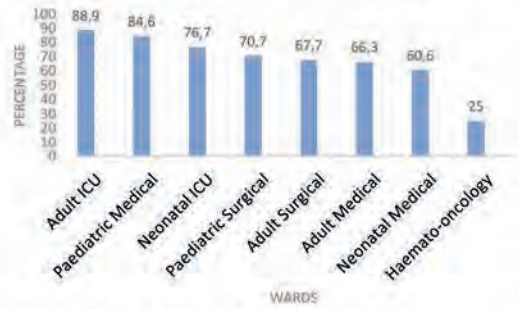

Table 1. Top 10 prescribed antibiotics for therapeutic and propylactic use

Therapeutic		Medical Prophylaxis		Surgical prophylaxis	
Antibiotic	**Total (%)**	**Antibiotics**	**Total (%)**	**Antibiotics**	**Total (%)**
Ceftriaxone	18.9	Metronidazole	15.0	Metronidazole	31.0
Metronidazole	18.0	Fluconazole	10.8	Ceftriaxone	23.8
Ciprofloxacin	9.9	Ceftriaxone	10.0	Cefuroxime	13.7
Cefuroxime	7.3	Amikacin	7.5	Ciprofloxacin	11.2
Gentamicin	4.6	Cefotaxime	5.8	Levofloxacin	4.0
Clindamycin	4.4	Co-trimoxazole	5.8	Co-amoxiclav	2.9
Levofloxacin	4.2	Gentamicin	5.8	Amoxicillin	2.2
Cefotaxime	2.5	Ciprofloxacin	5.0	Amoxicillin & enzyme inhibitor	1.8
Co-amoxiclav	2.5	Ampiclox	4.2	Clindamycin	1.8
Amoxicillin	2.1	Benzathine benzylpenicillin	4.2	Gentamicin	1.4

Figure 2. Indications for antibiotic prescriptions

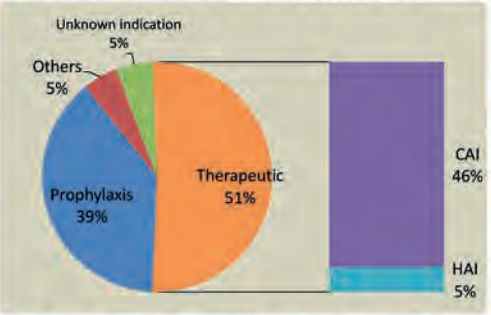

Table 2. Quality indicators of antibiotic prescribing

	Medical %	Surgical %	Intensive care %
Reason in notes	32.2	27.2	2.4
Guidelines compliant	7.1	4.1	0.3
Guidelines missing	30.7	39.2	5.9
Stop/review date	12.2	15.1	0.5
Targeted therapy	14.9	11.3	4.5
Parenteral use	68.1	57.4	92.5
Biomarkers	0.6	0.4	0

Most often prescribed systemic antimicrobials were third-generation cephalosporins (26.6%, mainly ceftriaxone [18.7%]), followed by metronidazole (17.1%) and quinolones (15.9%; mainly ciprofloxacin [9.6%]). Most prescriptions for surgical prophylaxis were given for more than one day (95.0%). Parenteral antibiotic use was common (74.8%). Indication for antibiotic prescription was documented in 61.8% of cases and a stop or review date was documented for 27.8%. Antibiotic guidelines were missing in 30.7% of medical and in 39.2% of surgical prescriptions. Compliance to local antibiotic guidelines was 7.1% for medical and 4.1% for surgical indications. Details on antibiotic quality indicators are shown in ***Table 2.*** Biomarker data were used in the decision to prescribe 0.5% of all antibiotics. CRP was used in 80% of those cases.

CONCLUSION

For the first time, antimicrobial prescribing practices have been evaluated in Nigerian hospitals. Very high antimicrobial prevalence rates were observed, especially in child and neonatal wards. We disclosed areas to improve antibiotic prescribing: absence of guidelines and antibiotic prescribing according to guidelines, low reporting of a stop/review date and prolonged surgical prophylaxis. We need to create awareness at the national level for targeted prescribing of antimicrobials and use of evidence based antibiotic guidelines.

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ECCMID 2016 [poster n° EV0700]

The Global Point Prevalence Survey of Antimicrobial Consumption and Resistance (Global-PPS): First Results of Antimicrobial Prescribing in Russian Hospitals

Russian Federation

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INTRODUCTION AND PURPOSE

Systemic antimicrobials (AM) belong to one of the most commonly used groups of drugs in hospital settings. It was estimated in previous studies that about 30% of patients in multi-field hospitals received AM agents. They accounted for up to 30-50% of total hospital expenditures for pharmacotherapy. It is well known that AM use and overuse is one of the main factors responsible for the development and spread of antimicrobial resistance among inpatients. Global-PPS, a uniform and standardized method for surveillance of AM use, was applied to assess variations in AM prescribing in Russian multi-field hospitals and identify targets for improvement.

METHODS

PPS was conducted in March-April 2015 in 3 pediatric hospitals (Novokuznetsk, Petrozavodsk, Stavropol), 3 secondary hospitals (Smolensk, Yakutsk, Perm) and 1 tertiary hospital (Moscow) – Figure 1. The survey included all inpatients receiving an AM on the day of PPS. Age, gender, weight, AM agents, doses, reasons and indications for treatment, microbiological data, compliance to guidelines, documentation of reasons and stop/review date of prescription were collected. Denominators included the total number of inpatients. A web-based application designed by the University of Antwerp (www.global-pps.com) was used for data-entry, validation and reporting.

RESULTS

The main results of the survey are presented in Table and Figures 2-4.

Figure 1. Geographical location of participated hospitals

Table. AM use in Russian hospitals	Smolensk	Yakutsk	Perm	Novokuznetsk	Stavropol	Petrozavodsk	Moscow
N of patients admitted/ N of wards surveyed	1079/31	515/16	482/11	338/10	353/11	357/11	288/13
Community-acquired vs nosocomial infections, %	83.5/16.5	89/11	83/17	57/43	58/42	73.5/26.5	7/93
Therapeutic vs prophylactic use of AM, %	59/41	55/45	60/40	51/49	77/23	87.5/12.5	56/44
Medical vs surgical prophylaxis, %	2/98	67/33	0/100	13/87	81/19	100/0	0/100
Duration of surgical prophylaxis	>1 day - 100%	1 day - 2% >1 day - 98%	1 day - 3% >1 day - 97%	1 day - 75% >1 day - 25%	1 dose - 100%	-	>1 day - 100%
Empirical vs targeted AM therapy, %	98/2	88/12	99/1	90/10	93/7	91/9	79/21
Guidelines noncompliance, %	45	2	5	8.5	0	5	0
Treatment based on biomarkers data, %	0	0.3	19.6	29.2	70.7	34	15
Documented stop/ review AM use date, %	14	0	4.4	9.7	20.7	51.8	82.9

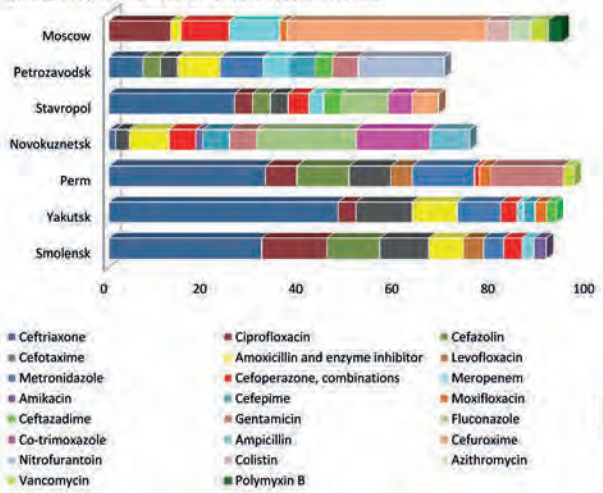

Figure 4. Top 10 AM used share (%) in the total consumtion

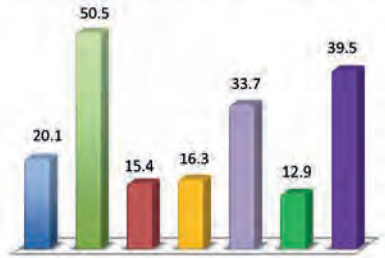

Figure 2. AM prevalence rate in *Russian* hospitals, %

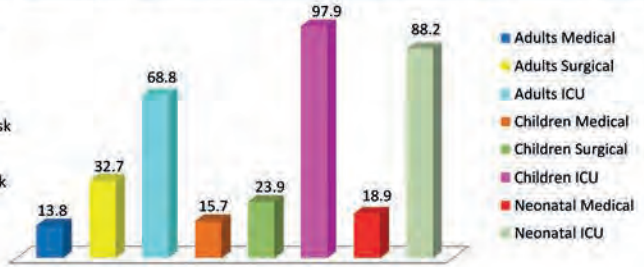

Figure 3. Antimicrobial prevalence rates (%) by type of unit

CONCLUSION

AM use rates as well as prescription patterns varied considerably among the hospitals partially due to different patients' profile. Therapeutic use prevailed at all sites with community-acquired infections being more common indication for AMs in all but one hospital. Extended duration of surgical prophylaxis and low adherence to local guidelines in Smolensk require additional education programs. Predominance of empirical therapy in Moscow, Novokuznetsk and Stavropol needs more detailed evaluation taking into account the high rate of nosocomial infections as an indication for AM use.

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ECCMID 2016 (poster n° EV0720)

Serbia

The Global Point Prevalence Survey of Antimicrobial Consumption and Resistance (Global-PPS): Results of antimicrobial prescribing in Serbian hospitals

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INTRODUCTION AND PURPOSE

Point Prevalence Survey (PPS) is an adequate surveillance method to study antimicrobial prescribing in hospitals and evaluate the changings over time. In Serbia there were 3 national PPS (1999, 2005, 2010) of hospital infections and antimicrobial prescribing, supported by Serbian Ministry of Health. In 2015, Serbian Association of Prevention and Infection Control (SAPIC) called Serbian hospitals to use the Global-PPS standardized method for surveillance of antimicrobial use and to assess the variation in antimicrobial prescribing in Serbia.

METHODS

Point prevalence study was performed voluntarily in one secondary care and 5 tertiary care Serbian hospitals in April-September 2015 using a Global PPS method. The survey included all inpatients receiving an antimicrobial on the day of survey. Relevant variables were collected like age, department of hospitalization, antimicrobial agents, doses, reasons and indications for treatment, microbiological data, compliance to guidelines, documentation of reasons and stop/review date of prescription. Denominators included the total number of inpatients. A web-based application was used for data-entry, validation and reporting as designed by the University of Antwerp (www.global-pps.com) .

RESULTS

Table 1. Antimicrobial prevalence

SERBIA		Adults N (%)	Children N (%)	TOTAL N (%)
Total number of patients studied in participating hospitals		2303 (=n)	431 (=n)	2734 (=n)
Total number of surgical patients studied		923	45	968
Total number of medical patients studied		1082	369	1451
Total number of ICU patients studied		298	17	315
Total number of pediatric patients studied		/	248	248
Total number of neonatal patient studied		/	183	183
Antibiotic prevalence for all reasons (CAI / HAI / prophylaxis): Total AM given including multiple antibiotics per patient		1451 (63.0%)	227 (52.7%)	1678 (61.4%)
Antimicrobial use/prevalence as prophylaxis	TOTAL	700 (30.4%)	72 (16.7 %)	772 (28.2%)
	Surgical prophylaxis n=surgical pts	498 (53.6%)	18 (40%)	516 (53.3%)
	Medical prophylaxis n= 2303	202 (8.8%)	50 (11.6%)	252 (9.2%)
Antimicrobial use for therapy	TOTAL	751 (32.6%)	155 (36%)	906 (33.1%)
	– in CAI	483 (21%)	113 (26.2%)	596 (21.8%)
	– in HAI	268 (11.6%)	42 (9.7%)	310 (11.3%)
Antimicrobial use in therapy	TOTAL	(n=) 751	(n=) 155	(n=) 906
	– Targeted	246 (32.7%)	23 (14.8%)	269 (29.7%)
	– Empirical	505 (67,2%)	132 (85.2%)	637 (70.3%)
Quality indicators	Reason documented (n= total AM given)	423 (29.1%)	179 (78.8%)	602 (35.9%)
	Guideline used (n= total AM given)	660 (45.5%)	37 (16.3%)	697 (41.5%)
	Guideline compliant (n= guideline used)	497 (75.4%)	35 (96.4%)	599 (85.9%)
	Stop/review date documented (n= total AM given)	201 (13.9%)	11 (5%)	159 (9.5%)

Table 2. Top 5 prescribed antibiotics

Surgical prophylaxis, N=498		Medical prophylaxis, N=252		Sepsis, N= 46		Pneumonia, N=159	
Ceftriaxone	30.3%	Ceftriaxone	15.2%	Ampicillin	8.7%	Ceftriaxone	24.5%
Metronidazole	16.9%	Amoxicillin	14.7%	Vancomycin	8.7%	Ciprofloxacin	12.6%
Cefuroxime	13.8%	Gentamicin	10.9%	Meropenem	8.7%	Levofloxacin	11.9%
Ciprofloxacin	9.4%	Metronidazol	10.9%	Gentamicin	8.7%	Ceftazidime	11.3%
Gentamicin	5.6%	Ciprofloxacin	9.9%	Ceftazidime	8.7%	Metronidazole	9.4%

Figure 1. Duration of surgical prophylaxis in Serbian hospitals

The total number of patients surveyed was 2303 adults and 431 children, with antimicrobial (AM) utilization of 63% and 53%, respectively *(Table 1)*. Distribution of patients, AM prevalence rates for prophylaxis and therapy, frequency of empirical and targeted prescription and quality indicators of utilization of AM are shown in *Table 1*. Out of all patients, 88% received more than one day AM surgical prophylaxis, 10% received one day and only 2% single dose *(Figure 1)*. Empiricaly prescription of AM was registered in 67% of adults and in 85% of pediatric and neonatal patients. Only in 35% adults and in 8% pediatric and neonatal cases AM prescription was done using a guideline, but the compliance was 75% and 96%, respectively. Reason in notes could be seen in almost every second pediatric/neonatal patient and every third adult patient. Stop/review order was not really a common practice in our hospitals. Top 5 antimicrobials are shown in *Table 2*.

CONCLUSION

The result of the G-PPS in Serbian hospitals identify a clear need for antimicrobial stewardship program interventions. It is necessary to improve antimicrobial prescribing: to create and regulary update local guidelines, with an appropriate agent, dose and route of administration and duration of therapy and prophylaxis and to reach a high guideline compliance in practice.

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ECCMID 2015 (poster EV0678)

Slovenia

The global point prevalence survey of antimicrobial consumption and resistance (Global-PPS): first results of antimicrobial prescribing in University Medical Centre Ljubljana (UMCL), Slovenia

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INTRODUCTION AND PURPOSE

UMCL was the only hospital in Slovenia which participated in the Global-PPS. UMCL is the biggest state hospital which represents approximately one third of hospital beds in the country. UMCL has more than 100.000 admissions per year. With multifaceted antimicrobial stewardship programme and infectious diseases specialist consultations antimicrobial resistance and consumption in UMCL is relatively stable. The purpose of PPS in UMCL was to use a uniform and standardized method to assess antimicrobial (AM) use in the hospital and to compare it with other hospitals in Europe and worldwide.

METHODS

The Global-PPS in UMCL was conducted in March and April 2015. The survey included all inpatients receiving an AM on the day of PPS. Data collected included age, gender, weight, antimicrobial agents, doses, reasons and indications for treatment, microbiological data, compliance to guidelines, documentation of reasons and stop/review date of prescription. Denominators included the total number of inpatients per ward. A web-based application was used for data-entry, validation and reporting as designed by the University of Antwerp.

RESULTS

On the day of PPS a total of 1763 patients were hospitalized at UMCL and a total of 60 wards were surveyed. The hospital does not have a dedicated transplant unit which precluded the assessment of AM use in transplant wards. The AM prevalence was the highest in hematology and intensive care wards for adults. A similar pattern can be seen for pediatric and neonatal wards with AM prevalence in haemtology-oncology ward being 100%. (Table 1)

Adult wards

Our hospital	Total	AMW	HO-AMW	T-AMW	P-AMW	ASW	AICU
patients (N)	1493	673	31	0	12	702	78
treated patients (%)	29.5	27.0	64.5	0	25	26.1	61.5

Pediatric wards

Our hospital	Total	PMW	HO-PMW	T-PMW	PSW	PICU
patients (N)	172	89	14	0	49	11
treated patients (%)	28.0	20.2	100	0	22.4	45.5

Neonatal wards

Our hospital	Total	NMW	NICU
patients (N)	94	65	29
treated patients (%)	5.3	3.1	10.3

Table 1: Overall AM prevalence in adult, pediatric and neonatal wards for UMCL

Top 3 most common diagnoses treated with AM were pneumonia/lower respiratory tract infection, intra-abdominal sepsis and upper urinary tract infection. (Table 3).

Diagnosis	Our hospital N	%
Pneu	97	26.6
IAI	47	12.9
Pye	35	9.6
SST	33	9.1
SEPSIS	28	7.7
BJ	22	6.0
Other	16	4.4
FN	13	3.6
GI	11	3.0
Bron	10	2.7

Table 3: Ten most common diagnoses treated with AM in UMCL

The most frequently prescribed AM were penicillins, together with other β-lactams they summed up for more than 70% of AM. Fluoroquinolones were third most prescribed antibiotics (Figure 1). Among other β-lactams we use predominately first generation cephalosporins (surgical prophylaxis) and carbapenems (Figure 2).

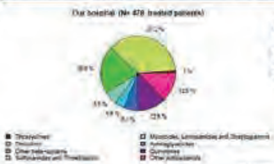

Figure 1: Overall proportional AM use in UMCL

Figure 2: Proportional use of other β-lactams in UMCL

In UMCL antibiotics were used slightly more often for healthcare associated infections (HAI) than community acquired infections (CAI) (Figure 3).

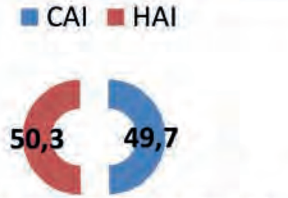

Figure 3: Therapeutic AM use for CAI en HAI

Single dose antibiotic surgical prophylaxis was used in UMCL in slghtly less than one third of patients (Figure 4).

Figure 4: Duration of AM prophylaxis in surgery.

In UMCL the quality of prescribing was better in documenting reason for AM in notes and guidelines compliance, and worse in documenting the stop/review date. Guidelines were available for almost every patient (Figure 5).

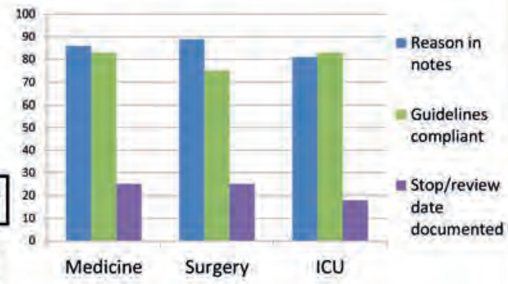

Figure 5: Summary of quality indicators for antibiotic use.

CONCLUSION

Global-PPS provided an insight into antimicrobial prescribing at UMC Ljubljana. According to the results we came to the following conclusions:

1.) AM use in hematology and intensive care units should be further analyzed and improved.
2.) Improvements should be done to lower the use of fluoroquinolones.
3.) Better infection control and antimicrobial stewardship are needed to lower the prevalence of HAI.
4.) Stop/review date of prescribed AM should be documented more frequently.
5.) We should decrease the duration of surgical prophylaxis.

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ECCMID 2016 poster No. P 1225

Point Prevalence Surveys of antimicrobial consumption over a 10 year period at University Medical Centre Ljubljana, Slovenia

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INTRODUCTION & PURPOSE

Point prevalence surveys (PPS) of AM consumption were conducted over a ten year period at University Medical Centre (UMC) Ljubljana, a tertiary care hospital in Slovenia, as a part of various European projects. In 2006[1], 2008 and 2009 the PPS were a part of multicentric PPS of AM consumption carried out by The European Surveillance of Antimicrobial Consumption (**ESAC**)[2]. In 2011 and 2012 these PPS were a part of multicentric PPS of healthcare-associated infections and AM use in European acute care hospitals conducted by European Centre for Disease Prevention and Disease Control (**ECDC**)[3]. Finally, in 2015 the PPS was a part of **The Global PPS**[4] of AM consumption and resistance designed and carried out by a group of researches at Laboratory of medical microbiology, University Antwerp, Belgium. Since all of these studies were well designed, standardized and thoroughly carried out, we gained a large pool of data on AM consumption at UMC Ljubljana, that can be compared throughout the period of 10 years and trends of AM use can be described.

METHODS

PPS were conducted altogether 7 times from 2006 to 2015 at the University Medical Centre (UMC) Ljubljana. All surveys included inpatients in intensive care units (ICU), adult medical wards (AMW), adult surgical wards (ASW) and Department of infectious diseases (DID) receiving an AM on the day of PPS. From the data collected during the PPS over the ten year period the following data were included in the present study: AM prevalence, AM agents, route of administration, indications, duration of surgical prophylaxis, diagnoses and compliance to guidelines. Denominators included the total number of inpatients. Trends of the above mentioned data over the ten year period were described.

RESULTS

The AM prevalence for the ICU, AMW, ASW and DID in general is shown in Table 1.

Table 1: *AM prevalence for the ICU, AMW, ASW and DID.*

	ICU	AMW	ASW	DID
AM prevalence	52-83%	30-34%	21-37%	72-80%
Department with the highest AM prevalence	Surgical ICU 75-100%	Department of haematology 53-69%	Department of plastic surgery and burns 27-73%	/
Department with the lowest AM prevalence	Neonatal ICU 10-27%	Department of endocrinology 7-55%	Department of neurosurgery 11-31%	/

Regarding the **trends of AM prevalence** over the 10 year period only a slight decrease in the ICUs (from 62% in 2006 to 52% in 2015) and at AMW (from 34% in 2006 to 30% in 2015) was observed. Over the ten year period in general no trends in the AM prevalence at ASW and at DID can be observed.

For the period of 10 years and together for ICUs, AMW, ASW and DID **the top 3 groups of AM at ATC3 level** prescribed were penicillins with other beta-lactams (J01C, J01D respectively, each group 24%), followed by the group of other antibacterials (J01X, 22%) and quinolones (J01M, 15%).

Regarding **the 10 year trends of AM at ATC3 level** an overall increase of penicillins (J01C), a decrease of other beta-lactams (J01D) and a decrease of other antibacterials (J01X) prescribed are observed. There are no trends for other AM, including quinolones (J01M), observed. Trends of J01C, J01D, J01X, J01M prescribed at ICUs, AMW, ASW and DID together for the 10 year period are shown at Chart 1.

The 10 year trends of **surgical prophylaxis** at ASW show a decrease in prophylaxis prescribed for > 1 day (from 84% in 2006 to 59% in 2015) and an increase in prophylaxis prescribed as a single dose (from 6% in 2006 to 31% in 2015) (Chart 2).

Chart 1: *The percentage of AM at ATC3 level prescribed for the 10 year period.*

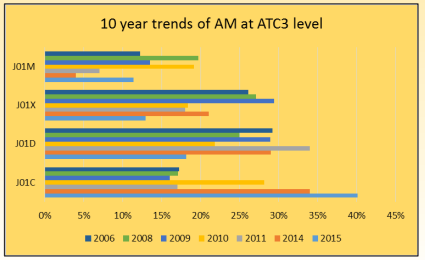
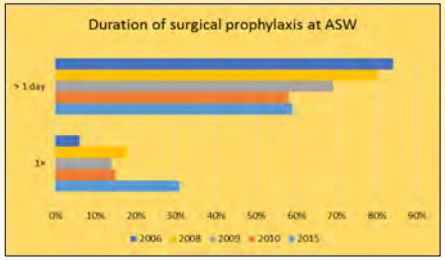


Chart 2: *The duration of surgical prophylaxis at ASW for the 10 year period.*



CONCLUSIONS & DISCUSSION

PPS conducted from 2006 to 2015 provided an insight into antimicrobial prescribing at UMC Ljubljana during this period. In general results of PPS show no trends or only a slight decrease in AM prevalence at UMC Ljubljana. The use of penicillins increased and the use of other beta-lactams and other antibacterials decreased. There was a decrease in surgical prophylaxis prescribed for > 1 day observed. These results reflect the fact that an antimicrobial stewardship program is present at UMC Ljubljana and that in recent years some interventions took place. More in depth analysis of the gained data is needed to provide the background for additional interventions.

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ECCMID 2016 [poster n EV0708]

South Africa

The Global Point Prevalence Survey of Antimicrobial Consumption and Resistance (Global-PPS): Results of antimicrobial prescribing in a South African Tertiary Hospital

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INTRODUCTION AND PURPOSE

South Africa is a developing country with a high incidence of tuberculosis and HIV disease. There is a high burden of infectious diseases with frequent prescribing of antimicrobials. Antibiotic resistance is a global concern and South Africa is at risk of increasing rates of antibiotic resistance. Antibiotic Stewardship is important in trying to combat this threat. The PPS will help us monitor antibiotic prescribing practises and identify areas of concern which can be targeted for intervention.

METHODS

A PPS was conducted between April – August 2015, in a tertiary teaching hospital in Cape Town. All inpatients receiving an antimicrobial on the day of PPS were included in the survey. Data collected included age, gender, weight, antimicrobial agents, doses, reasons for treatment, microbiological data, compliance to guidelines, documentation of reasons and stop/review date. Denominator included all admitted patients. A web-based application was used for data-entry, validation and reporting as designed by the University of Antwerp (www.global-pps.com). The study was approved by the Stellenbosch University Ethics committee.

RESULTS

A total of 58 wards (11 ICU, 25 medical and 22 surgical) and 1156 patients were surveyed during the PPS. Bed occupancy rate was 91%. 31% (359/1156) of patients were receiving antibiotics. ICU had the highest antimicrobial prescription rate at 70% (57/82), followed by medical wards (36%, 179/495) and surgical wards had the lowest (23%, 123/541). Breakdown by age group is shown in ***Table 1***.

	ADULT	PAEDIATRIC	NEONATAL
Treated patients (n)	837	187	132
Treated patients(%)	27.8	48.7	26.5
Medical(n)	286	130	120
Medical(%)	29	55.4	20.8
Surgical(n)	496	45	
Surgical(%)	23.4	15.6	
ICU(n)	55	12	12
ICU(%)	60.3	100	83.3

Table 1: Percentage of patients on antibiotics according to ward activity

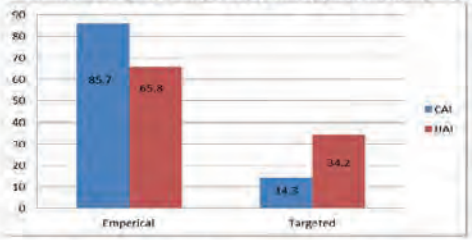
Indication	Number	Percentage
Pneumonia	87	27.2
Skin and soft tissue infections	57	17.8
Tuberculosis	35	10.9
Gastrointestinal Infections	22	6.9
Intra abdominal Sepsis	14	4.4
Central Nervous System	14	4.4
Sepsis	14	4.4
Bone and Joint Infections	10	3.1
ENT	10	3.1
Lower Urinary Tract Infections	8	2.5

Table 2: 10 Most common conditions for which antimicrobials were prescribed

Name	Number	Percentage
Amoxicillin and enzyme inhibitor	65	11.48%
Ampicillin	39	6.89%
Ceftriaxone	33	5.83%
Meropenem	28	4.95%
Amoxicillin	27	4.77%

Table 3: 5 Most frequently used Antimicrobials

Antimicrobials were most frequently prescribed for community acquired infections(CAI) (n=392; 76.%)



Parental antibiotic prescription was high at 56% (321/566). The majority of prescriptions were empirical (468/566 (83%)).

Figure 1: Antimicrobial use for community and hospital acquired infections by type of treatment. (Percentage)

Quality Indicators: Guideline compliance was 73% (414/566) with 86% (489/566) Of doctors documenting the reason for prescription in the notes, however only 11% (62/566) had documented a stop or review date on the prescription chart. Breakdown by discipline is shown in ***Table 4.***

	Medical		Surgical		ICU	
	N	%	N	%	N	%
Reason in Notes	193	91.5	109	77.3	80	89.9
Guideline Compliant	136	83.4	64	61.0	41	83.7
Stop/Review Date Documented	32	15.2	13	9.2	11	12.4

Table 4: Quality indicators by Discipline

CONCLUSION

The PPS provided useful information on the quality of prescribing, and identified a number of targets for quality improvement. The prevalence of antibiotic prescribing, HAIs, the diagnosis and treatment of LRTIs, high prevalence of the intavenous route and the lack of documenting start or review dates should recieve attention. The PPS did not include more detailed information that may be amenable to antibiotic stewardship interventions eg. appropriate samples sent before starting antimicrobials, duration and appropriateness of the intravenous route. Based on this PPS, we will introduce interventions, including a dedicated antibiotic prescription chart, limited restrictions on the use of certain antibiotics in the general wards, increased training on appropriate antibiotic use and updating institutional guidelines. A post intervention PPS should be conducted in one year to assess the efficacy of these interventions.

We would like to acknowledge the following who helped with data collection: Drs Angela Dramowski, Helena Rabie, M van Schalkwyk, S Hugo, K Greyling, P Nel, K Reddy, A Roscher, A Abdulfathi, H Prozesky, P Botha, and Miss FO Mazari who helped with data entry.

Disclosures: "**bioMérieux** is the sole sponsor of the GLOBAL Point Prevalence Survey. The funder has no role in study design, data collection, data analysis, data interpretation, or writing the report. Data are strictly confidential and stored anonymous at the coordinating centre of the University of Antwerp."

The Global Point Prevalence Survey of Antimicrobial Consumption and Resistance (Global-PPS): First Results of Antimicrobial prescribing in English hospitals - Quality Indicators

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INTRODUCTION AND PURPOSE

A uniform and standardized method for surveillance of antimicrobial use in hospitals was used to assess the variation in antimicrobial prescribing in England as part of the Global-PPS project. bioMérieux provided unrestricted funding support for the survey. Quality Indicators collected in this survey form part of Public Health England (PHE) antimicrobial stewardship toolkit. Interorganisational benchmarking of quality indicators are part of the new National Institute of Healthcare and Care Excellence (NICE) antimicrobial stewardship (AMS) guidelines(1).In addition the national UK Commissioning for Quality and Innovation (**CQUINs**) payments framework for antimicrobial stewardship has just been released providing financial incentives to reduce antimicrobial prescribing in general and carbapenem prescribing in particular (2).

METHODS

A point prevalence survey (PPS) was conducted from February to September 2015 in 16 different hospitals. The survey included all inpatients receiving an antimicrobial on the day of PPS. Data collected included compliance to guidelines, documentation of reasons and stop/review date of prescription, age, gender, weight, antimicrobial agents, doses, reasons and indications for treatment and microbiological data,. Denominators included the total number of inpatients. A web-based application is used for data-entry, validation and reporting as designed by the University of Antwerp (www.global-pps.com).

RESULTS

Results from 14 hospitals settings were analysed. Five were community hospitals, 2 were paediatric speciality hospitals, and the remaining 7 large teaching or acute hospitals. 3398 patients were reviewed of which 1144 (34%) were on on antibiotics. The total number of antibiotics prescribed were 1992 , an average of 1.7 per patient. 87% of anti-infectives across all settings had documented indications in the notes and were compliant with local anti-infective guidelines with the exception of primary care. Stop and review dates had a lower compliance between 78-88%. **(see Table 1.)** Carbapenem usage occurred in 9 hospitals, 7 of which were secondary tertiary hospitals. Median carbapenem point prevalence in adult patients was 2.22% (range 0.84% – 8.62%). There was a significant difference in carbapenem use between hospitals ($p<0.0001$). **(see Figure 1.)** There was no correlation between the hospital carbapenem prevalence and guideline compliance. **(See Figure 2.)**

Table 1. Quality measures by patient type.

	Overall total	Paediatric Patients#	Adult Patients	Community Hospital
Anti-infectives prescribed	1992	44	1532	16
Indications in notes	1838 (92%)	416(94%)	1406 (92%)	16 (100%)
Stop or review date	1438 (72%)	291 (66%)	1133 (74%)	14 (88%)
Guideline compliant	1563 (87%)*	351 (91%)*	1201 (86%)*	11 (73%)*
Guideline non-compliant	233	33	196	4
No guidelines for specific indication	179	55	123	1
No indication to assess compliance	17	5	12	0

***For guideline compliance percentage, anti-infectives where no guideline existed were subtracted from the total number of anti-infectives prescribed before the calculation.**
 # includes paediatric specialty hospitals and paediatric patients in mixed hospitals.

Figure 1. Carbapenem prevalence rates (%) by hospital. Adult - Large Acute & Teaching

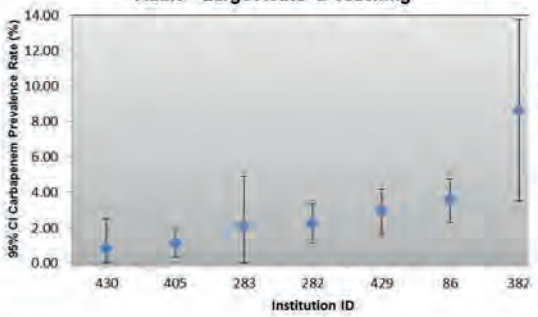
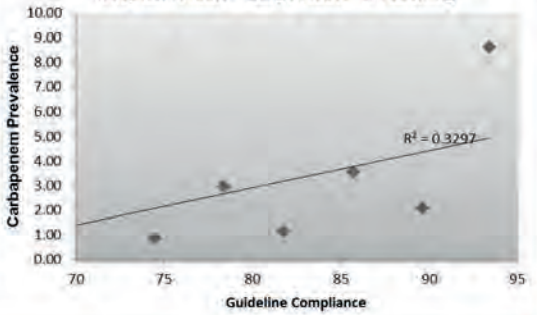


Figure 2. Compliance vs carbapenem prevalence rates (%) by hospital . Adult - Large Acute & Teaching



CONCLUSION

The Global-PPS survey has provided our hospitals with an efficient tool to monitor and benchmark AMS quality indicators as required by the NICE guidelines to improve practice. This previously has been logistically very difficult due to the lack of national tools. Despite some variation, quality indicators in this survey showed high compliance. There is a wide statistically significant variation in carbapenem prevalence from 0.84% to 8.62%. The absence of correlation between guideline compliance and carbapenem prevalence suggests that the local guidelines themselves may be responsible for the variation rather than prescriber compliance. The wide variation in carbapenem use provides evidence of the potential for carbapenem use reduction in line with the UK CQUIN framework for antimicrobial stewardship.

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United States

ECCMID 2016 (poster n°5642)

The Global Point Prevalence Survey of Antimicrobial Consumption and Resistance (Global-PPS): First Results of Antimicrobial prescribing in United States Hospitals

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INTRODUCTION AND PURPOSE

Introduction

Studies estimate that up to 50% of antimicrobial prescribing is inappropriate. Overuse and misuse of antibiotics is the single most important factor in selecting for antimicrobial resistance. The Centers for Disease Control and Prevention(CDC) estimate over 2 million people are infected with antibiotic resistant organisms yearly in the US.

This report reviews the antimicrobial prescribing in the United States(US) with a population of almost 320 million. 15 hospitals were surveyed all affiliated with Hospital Corporation of America(HCA). HCA is the largest healthcare system in the US with over 160 acute care facilities in 20 states.

Purpose

The purpose of the study is to quantify the quality of antimicrobial prescribing and to evaluate the determinants of inappropriate antimicrobial prescribing in the US in hospitalized adults, children and neonates. Results will identify targets to improve antimicrobial prescribing based on local needs assessment.

BACKGROUND

Antimicrobial resistance (AR) and *Clostridium difficile* infections continue to rise in the US. Both the CDC and the President's Action Plan on AR strongly advise implementing an effective antimicrobial stewardship program. Having a uniform and standard method for surveillance of antimicrobial prescribing and to evaluate the variation in antimicrobial prescribing is an important step to identify opportunities for improvement.

METHODS

PPS was conducted from March to September 2015, in 15 US hospitals 5 tertiary, 9 primary, and 1 specialty. The survey included all inpatients receiving an antimicrobial on the day of PPS. Data collected included age, gender, weight, antimicrobial agents, doses, reasons and indications for treatment, microbiological data, compliance to guidelines, documentation of reasons and stop/review date of prescription. Denominators included the total number of inpatients. A web-based application is used for data-entry, validation and reporting as designed by the University of Antwerp (http://www.global-pps.com).

RESULTS

The overall antimicrobial (AM) prevalence rate in adults and paediatric units was 45% and 49% respectively, highest in the transplant units and adult intensive care units (ICU) and lowest in neonatal ICU. The majority of infections were community acquired (CA) (61%). For CA infections 82% AM was considered empiric and 18% targeted. MRSA was the most frequent organism for targeted treatment. We saw a similar pattern for healthcare-associated infections. The most common diagnoses for therapeutic AM was pneumonia, urinary tract infections, and skin and soft tissue infections. Guideline compliance was >80%. Intravenous route was preferred in ~85% of cases. Highest proportion of AM use was penicillins and other beta-lactams followed by quinolones. Of the beta-lactams extended spectrum penicillins and third and fourth-generation cephalosporins were most commonly prescribed. In paediatrics we observed more aminoglycosides use and lower use of quinolones compared to adult hospitals. Prophylactic AM use was higher in medical compared to surgical. The most frequently used AM for medical prophylaxis was trimethropim/ sulfamethoxazole, fluconazole, and levofloxacin. Cefazolin was the most commonly administered drug for surgical prophylaxis.

Table 1

	Country	
	N	%
MEDICAL		
Reason in notes	952	88.3
Guidelines missing	283	26.3
Guideline compliant	497	83.8
Stop/review date documented	313	29.0
SURGICAL		
Reason in notes	296	82.0
Guidelines missing	81	22.4
Guidelines compliant	188	87.0
Stop/review date documented	132	36.6
ICU		
Reason in notes	362	86.6
Guidelines missing	80	19.1
Guideline compliant	177	81.9
Stop/review date documented	108	25.8

40% of patients received more than one day for surgical prophylaxis. Details on antibiotic quality indicators are shown in *Table 1*. Reason in notes for stop/review was only ~30%.

CONCLUSION

In conclusion we found a high prevalence of AM use in the US especially in transplant and adult ICUs. Overall AM prevalence was higher in the US compared to Europe. Most AM administration was for empiric treatment. Medical prophylaxis was common and surgical prophylaxis was continued beyond 1 day in over a third of cases. A stop date or review was documented in only 30% of cases. This survey provides the quantity and quality of antimicrobial prescribing globally and at the hospital level. These baseline results highlight areas for improvement and enable hospitals to benchmark improvement over time focusing on surgical prophylaxis and duration of treatment by implementing a 72-hour time-out.

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Calgary Participation in the Global Point Prevalence Survey of Antimicrobial Consumption & Resistance: A Tool for Identification of Targets for Quality Improvement in Antimicrobial Stewardship

Alberta Health Services

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INTRODUCTION AND PURPOSE

The Global Point Prevalence Survey of Antimicrobial Consumption and Resistance (GLOBAL-PPS) is an ambitious project that expands the standardised and validated European Surveillance of Antimicrobial Consumption (ESAC) Point Prevalence Surveillance (PPS) method of data collection.

Given the importance of Antimicrobial Stewardship (AS) in acute care hospitals across Canada, and with all hospitals in Calgary participating in GLOBAL-PPS, a unique opportunity was provided to use the data collected to identify targets for quality improvement (QI) at a local level.

METHODS

A point prevalence survey was conducted between February-April 2015, in all wards of all five tertiary hospitals (4 adult/1 paediatric) in Calgary, Alberta (population 1.4 million). The widely adopted ESAC PPS methodology[1] was used, after an initial pilot survey was trialled with a limited scope in 2013.

Within 4 consecutive weeks, all wards in each hospital were surveyed on a single day for bed census, and for inpatients on antimicrobial agents at 0800 hours. Detailed data were collected using a standardized and validated method (www.global-pps.com) for surveillance of all inpatients receiving an antimicrobial on the day of the survey. Antimicrobials were surveyed according to the World Health Organization (WHO) Anatomical Therapeutic Chemical classification.[2]

Detailed patient data were anonymously entered online using a web-based tool for data-entry, validation and reporting, which was housed and coordinated by the University of Antwerp.

Denominator data included all admitted inpatients, collected at the ward level. Surveyors were comprised of infection control practitioners, and infectious diseases physicians/ pharmacists.

Table 1. Prevalence Rates, Adult Patients (n=666), all Calgary Hospitals

Healthcare-associated infection (HAI)	17%	
CDAD	4%	→33% received vancomycin
Cefazolin for surgical prophylaxis	11%	→32% received ≥ 3 days duration
Piperacillin/tazobactam	13%	→39% for HAI; 84% empiric
Meropenem	3%	
Vancomycin IV	8%	
Linezolid (PO/IV)	1.4 %	

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RESULTS

Worldwide participation in the GLOBAL-PPS is shown in Figure 1. Only two other (non-teaching) hospitals in one other region in Canada participated, which limits a Canadian analysis. [3] Furthermore, the other region is located >4,500 km away in eastern Canada.

Overall, 30% of all patients in our hospitals were receiving at least one antimicrobial (31% adult, 24% paediatric) at the time of the PPS. Of 666 adult and 66 paediatric patients, 55% and 33% respectively, were receiving at least one antibiotic via the oral route. For adult and paediatric patients (excluding neonates), the most common indication for antimicrobials was lower respiratory tract infection.

As shown in Table 1, 17% of adult patients were receiving an antimicrobial for a healthcare-associated infection, and 4% of adults were being treated for *C.difficile* associated diarrhea (CDAD). Regarding broad-spectrum drugs, 13% of adult patients received piperacillin-tazobactam (39% for healthcare-associated infections; 84% empiric therapy), while 3% of adult patients received meropenem.

As shown in Figure 2, seventy-four of 666 adult patients (11%) were receiving cefazolin as surgical prophylaxis, and for 24 of the 74 patients (32%), the duration was greater than 3 days.

Finally, in terms of quality indicators, for 84% of adult patients, and 94% of paediatric patients, a reason was given (in the medical record) for at least one of the antimicrobials, and a stop/review date was documented for at least one of the antimicrobials for 66% of adult patients (data not shown). The same data at the antibacterial level is shown in Table 2.

Figure 1. Worldwide distribution[3] of countries that participated in the GLOBAL-PPS

Table 2. Two Quality Indicators, all Calgary Hospitals, count at antibacterial level

	Quality Indicator [ward type]	Medical %	Surgical %	ICU %	Average %
Adult	Reason in Notes	89	71	86	82
	Stop/review date documented	63	66	50	60%
Paediatric & Neonatal	Reason in Notes	98	75	97	90
	Stop/review date documented	53	38	63	51

Figure 2. Duration of cefazolin in the 11% of adult patients (n=74) who received cefazolin as surgical prophylaxis

CONCLUSIONS

- The standardized GLOBAL-PPS was a valuable process
- It allows for comparison with other global sites for benchmarking purposes
- It also identified areas for QI initiatives, at the local level including:
  - i) prolonged surgical prophylaxis in adults,
  - ii) parenteral vancomycin use
  - iii) addition of documented stop dates for all patients
  - iv) documentation of antibiotic indication in surgical patients

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Antimicrobial Point Prevalence Survey in University Children's Hospital Latvia

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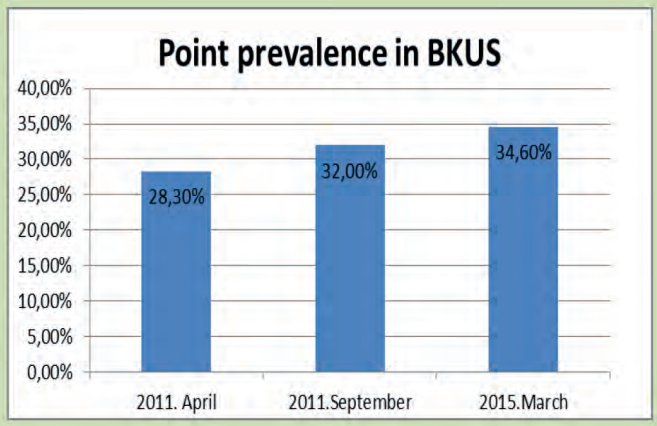
Background: Antibiotics are the most popular prescribed treatment for community-acquired infection and healthcare associated-infection. In literature point prevalence for hospitalized children was reported 17-59%. Inappropriate and excessive use of antibiotics among hospitalized children has been linked to the emergence of antibiotic-resistant bacteria that may spread and persist in hospitals and the community. There is a critical need for antimicrobial prescribing control for children.

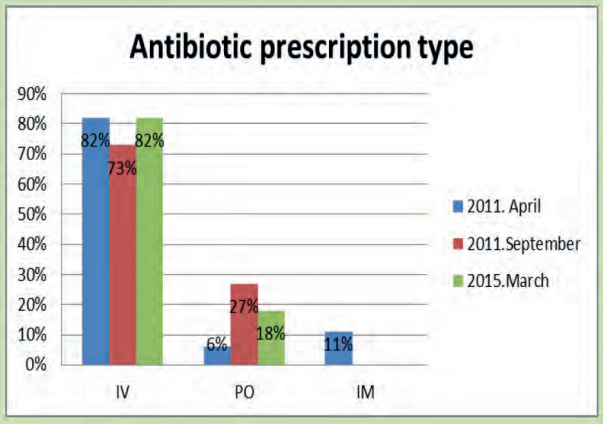
Aims: Explore the antimicrobial point prevalence in University Children's hospital Latvia.

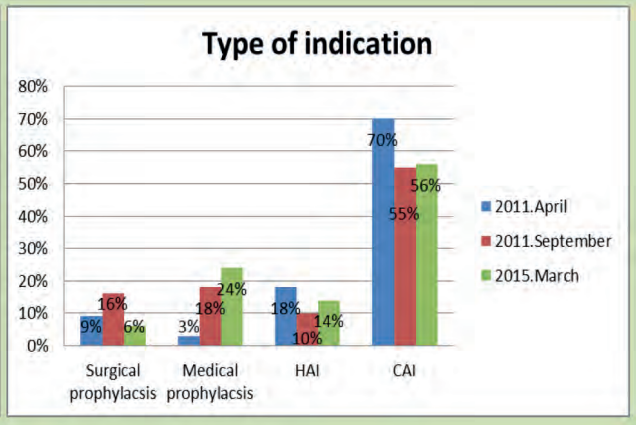
Methods: One day point prevalence survey (PPS) on antimicrobial use in hospitalized children in University Children's Hospital was organized in 05.04.2011 – A, 21.09.2011 – B, 25.03.2015 – C (Global-PPS). There was collected data from medicine documents about all children hospitalized till 8:00 clock and prescribing one or more antibiotics.

Results: There were A-364, B-328 and C-338 hospitalized patients at survey day. Antibiotic use was A-103 (28,3%), B-105 (32,0%) and C-117 (34,6%), in surgery departments A-26 (33,3%), B-31 (29,5%) and C-22 (32,4%), in pediatric departments A-65 (25,3%), B-57 (28,9%) and C-74 (31,0%), in intensive care departments A-12 (41,4%), B-17 (65,4%) and C-21 (67,7%). Overall antibiotic use was significantly higher in intensive care departments. Antibiotic was prescribing for surgical prophylaxis A-9, B-17 and C-7 patients, for medical prophylaxis A-3, B-19 and C-28 patients, for healthcare associated infection (HAI) A-19, B-11 and C-16 patients and for community acquired infection (CAI) A-72, B-58 and C-66 patients. Most popular prescribed antibiotics were A-*Amoxicillinum* (18 patients (14,1%)) and *Ceftriaxonum* (17 patients (13,3%)), B-*Sulphamethoxozole/Trimethroprim* (20 patients (13,1%)) and *Ceftriaxonum* (15 patients (9,8%)) and C-*Cefuroximum* (22 patients (14,9%)) and *Amoxicillinum* (20 patients (13,5%)). Most popular antibiotic prescription type were intravenous (A-105 (82%), B-112 (73,2%) and C-121 (81,8%)).



Conclusions: In this survey antimicrobial point prevalence in University Children's Hospital hospitalized patients was A-28,3%, B-32,0% and C-34,6%, what confirms average antimicrobial point prevalence in Europe. However, from this survey we observe, that there are trend to increase point prevalence in University Children's Hospital.





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