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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 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 (%)	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
Australia/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

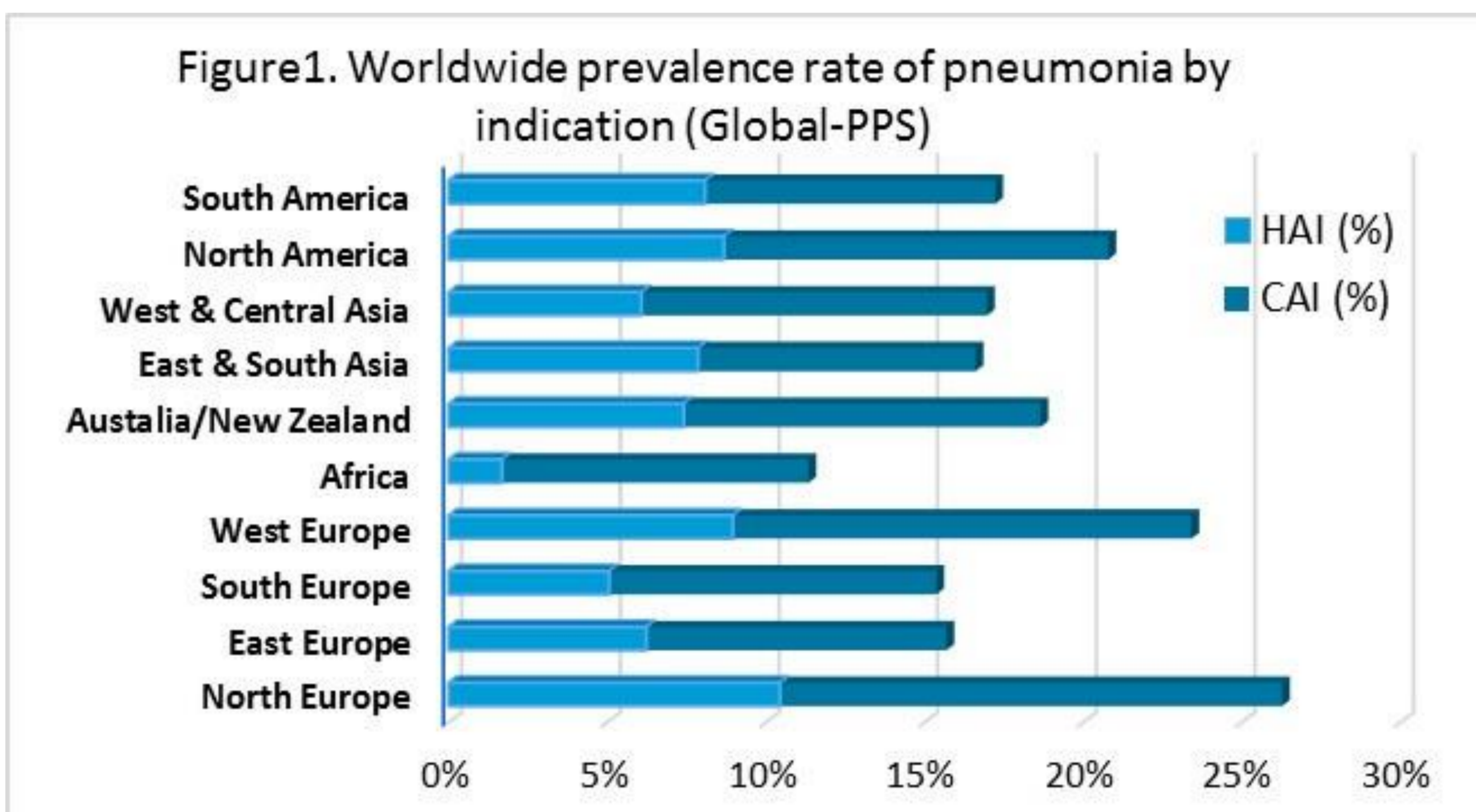


Table 2. Most used antibiotics (%) prescribed for CAP in Adults (adult wards)

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)	Australia & 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)	Australia & 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			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

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)	Australia & 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
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."