



GLOBAL POINT PREVALENCE SURVEY OF ANTIMICROBIAL CONSUMPTION AND RESISTANCE (GLOBAL-PPS)



Global-PPS and the role of the nurse in capacity building for antimicrobial stewardship

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For the Iranian Global-PPS team
Prof. Jafar Soltani, colleagues and all nurses

The 3rd International Congress on Prevention Strategies for HAI

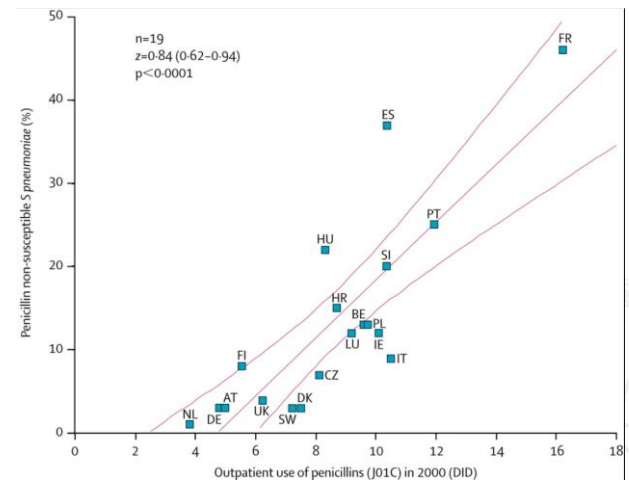
The Global-PPS is coordinated
by the University of Antwerp
and supported by bioMérieux





Antibiotic Resistance Infections Affect Millions of People

- Combating antimicrobial resistance is one of the most pressing challenges in medicine today.
- The more we use antibiotics, the higher the prevalence of antimicrobial resistance, e.g. relation between outpatient use of penicillins and penicillin non-susceptible *S. Pneumoniae*; (Goossens *et al.*, Lancet, 2015)
- There is an increase of antibiotic use (ABU) during the COVID-19 pandemic, but multispecialty clinical teams can enhance antibiotic use reductions through stewardship guidance. (M.B. Staub *et al.*, Inf. Contr. Hosp. Epid., October 2020)





WHO : Year of the NURSE !



World Health
Organization

<https://www.who.int/campaigns/year-of-the-nurse-and-the-midwife-2020>



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The nurse has an essential role as an antimicrobial “resistance fighter”!



Overview

- Antimicrobial Resistance (AMR) and Antimicrobial Stewardship (AMS) – some definitions
- The birth of the Global-PPS
- Purpose
- Method in a nutshell
- Global-PPS results worldwide
- Results Iran
- Global-PPS and antimicrobial stewardship activities



What is Antimicrobial Resistance (AMR)

- AMR is the ability of a microorganism (e.g., bacteria, viruses, fungi, and some parasites) to stop an antimicrobial (e.g., antibiotic, antiviral, antifungal, or antiparasitic) from working against it.
- As standard treatments become ineffective, infections become harder to treat and may spread to others (PHAC, 2015; WHO, 2019a).
- The World Health Organization includes antimicrobial resistance as one of the top 10 threats to global health in 2019 (WHO, 2019b).
- A recent projection by the Organisation for Economic Co-operation and Development (OECD) predicts that by 2050, drug-resistant infections will lead to an estimated 2.4 million avoidable deaths in developed countries (OECD, 2018).





How does antimicrobial resistance affect my patient, my practice, myself?

- ❏ Antimicrobial resistance affects not just the person receiving antimicrobials, but the larger society as well.
- ❏ infections by drug-resistant organisms have been associated with poor health outcomes, increased length of stay in hospital, complications, and death (WHO, 2014).
- ❏ Most people with a resistant organism are **colonized**
 - Resistant organism is present in or on their bodies but not causing symptoms.
 - It greatly increases the risk of developing an infection, with symptoms of illness.
- ❏ Whether colonized or infected, the patient will be cared for using contact precautions.
- ❏ Precautions and separation can also result in stigma and social isolation.



What is Antimicrobial Stewardship (AMS) ?

*“... **coordinated interventions** designed to improve and measure the appropriate use of [antibiotic] agents by promoting the selection of the optimal [antibiotic] drug regimen including dosing, duration of therapy, and route of administration” (IDSA guideline, 2016)*



“... an organisational or healthcare-system-wide approach to promoting and monitoring judicious use of antimicrobials to preserve their future effectiveness” (UK, NICE guideline, 2015)

*“...the right antibiotic for the right **patient**, at the right **time**, with the right **dose**, and the right **route**, causing the least harm to the patient and future patients” (BSAC, Antimicrobial stewardship, from principles to practice, 2018)*



Challenges for antimicrobial stewardship

Review

Antibiotic stewardship in low- and middle-income countries: the same but different?

J.A. Cox ¹, E. Vlieghe ^{1, 2, *}, M. Mendelson ³, H. Wertheim ^{4, 5, 6}, L. Ndegwa ⁷, M.V. Villegas ⁸, I. Gould ⁹, G. Levy Hara ¹⁰

Clinical Microbiology and Infection, 2017

- Diagnostic capacity
- Knowledge and awareness among prescribers
- Access to objective information about the risks of antibiotic misuse
- Availability evidence-based guidelines
- Under- and overaccess / quality of antibiotics
- Infrastructural challenges
- Work within a team
- ...





Capacity building for Antimicrobial Stewardship



Goals of the WHO global action plan on antimicrobial resistance¹

- Improve awareness and understanding of antimicrobial resistance;
- Strengthen knowledge through surveillance and research;
- Reduce the incidence of infection;
- Optimize the use of antimicrobial agents;
- Ensure sustainable investment in countering antimicrobial resistance.



The NURSE has a role to play !

**GLOBAL ACTION PLAN
ON ANTIMICROBIAL
RESISTANCE**



¹World Health Organization, 2015. Global Action Plan on Antimicrobial Resistance.

<https://www.who.int/antimicrobial-resistance/global-action-plan/en/>



The need to partner with nurses to promote effective antibiotic stewardship (1)

Five nurse-driven antibiotic stewardship practices:

- Questioning the need for urine cultures;
- Ensuring early and proper culturing technique;
- Recording an accurate penicillin drug allergy history;
- Encouraging the prompt transition from intravenous (IV) to oral (PO) antibiotics;
- Initiating an antibiotic timeout.



Ref: E.J. Carter et al., Exploring the nurses' role in antibiotic stewardship: A multisite qualitative study of nurses and infection preventionists. Am J Infect Control, 2018.



The need to partner with nurses to promote effective antibiotic stewardship (2)

Some more nurse-driven antibiotic stewardship practices:

- Appropriate triage and isolation
- Timely antibiotic initiation and follow up (right time)
- Patients progress reporting (laboratory, radiology reports, ...)
- Reporting adverse events (e.g. diarrhea)
- Review antibiotic orders (changes in medications)
- Monitor isolation precautions (resistant infection)
- Patient and family education, discharge teaching
-



Ref: White paper: Redefining the Antibiotic Stewardship Team: Recommendations from the American Nurses Association/Centers for Disease Control and Prevention Workgroup on the Role of Registered Nurses in Hospital Antibiotic Stewardship Practices.

<https://www.cdc.gov/antibiotic-use/healthcare/pdfs/ANA-CDC-whitepaper.pdf>

Surveillance - The global-PPS Survey

Measurement

- Antimicrobial use
- Resistance
- Infections
- Antimicrobial quality indicators,



Objectives

- Assess simultaneously antibiotic use and antimicrobial resistance (AMR) impact
- Define empiric treatments
- Analyze epidemiology trends (resistance, antimicrobial use, Healthcare Associated Infections,)
- Evaluate interventions and allocate resources efficiently: set targets for improvement and measure the impact of interventions

To be done at hospital, local, regional, national, global levels



Global-PPS – How it started

The 4th Edition of the
World HAI Forum on HAI
and Antimicrobial
Resistance - Annecy,
France

University of
Antwerp, Belgium
→ European
Surveillance of
Antimicrobial
Consumption
(ESAC-PPS)



bioMérieux funding

**1st
worldwide
Global-
PPS**

**Three
Surveys/year**

2006-2009

2011-2012

June 2013

2014

2015

2017

2018-2020 ...

Antimicrobial
resistance and
prescribing in
European children
(ARPEC-PPS)

European funding

**Global-PPS
pilot**

Any hospital admitting
inpatients is welcome to
participate

Antimicrobial consumption and resistance in adult hospital inpatients in 53 countries: results of an internet-based global point prevalence survey

Ann Versporten, Peter Zarb, Isabelle Coniaux, Marie-Françoise Gros, Nico Drapier, Mark Miller, Vincent Jarlier, Dilip Nathwani, Herman Goossens, on behalf of the Global-PPS network*



Summary

Background The Global Point Prevalence Survey (Global-PPS) established an international network of hospitals to measure antimicrobial prescribing and resistance worldwide. We aimed to assess antimicrobial prescribing and resistance in hospital inpatients.

Methods We used a standardised surveillance method to collect detailed data about antimicrobial prescribing and

Lancet Glob Health 2018;
6: e419-29
Published Online
April 19, 2018
[http://dx.doi.org/10.1016/S2214-109X\(18\)30186-4](http://dx.doi.org/10.1016/S2214-109X(18)30186-4)

Amadeo B. et al, JAC 2010, Zarb P. et al, JAC 2011, Drugs 2011, CMI 2012, Drugs Aging 2012; Versporten A. et al, PIDJ 2013, JAC 2016; Jafar Soltani et al, Erciyes Med J. 2019.



Global-PPS purpose

- 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
- Identify targets to prevent Healthcare Associated Infections (HAI)
- Help designing stewardship interventions to promote prudent antimicrobial use and improve patient health
- Assess effectiveness of interventions through repeated PPS



Global-PPS surveillance tool

- On a voluntary basis
- Implementing a uniform standardized methodology
- Using a simple web-based tool : quality assurance, data validation process and feedback reporting
- Hospital builds up own database
- Hospital remains owner of own data
- Data storage on server at University of Antwerp, Belgium
- Guarantee of data privacy
 - Hospital names will never be revealed in any report or publication
 - Complete anonymous patient data-entry



Global-PPS & optional HAI module

Method in a nutshell

- 📍 Point Prevalence Survey = “snapshot at a particular time”
- 📍 All wards of the hospital are included “once”
- 📍 Data collection on 3 paper forms
 - ✓ Ward form for the collection of denominators
 - N patients admitted
 - N available beds
 - N patients with an invasive device (HAI module only)
 - ✓ Patient basic form (numerator)
 - ✓ Patient HAI form (numerator, optional)



Global-PPS & optional HAI module

Ward form

Ward Form (Mandatory : Fill in one form for each ward included in the PPS)
Include only inpatients "admitted before and present at 08:00 hours" on the day of the PPS!

Date of survey (dd/mm/year)			Person completing form (Auditor code) :		
Hospital name :			Ward Name :		
Ward Type: Tick the most appropriate type of department/ward	Adult wards			Paediatric wards	
	<input type="checkbox"/> AMW (General or mixed Adult Medical Ward) <input type="checkbox"/> HO-AMW (Haematology-Oncology) <input type="checkbox"/> T-AMW (Transplant (BMT/solid)) <input type="checkbox"/> P-AMW (Pneumology) <input type="checkbox"/> CAR-AMW (Cardiology) <input type="checkbox"/> NEU-AMW (Neurology) <input type="checkbox"/> REN-AMW (Nephrology) <input type="checkbox"/> ID-AMW (Infectious Disease) <input type="checkbox"/> DB-AMW (Dermatology-burn wards) <input type="checkbox"/> PSY-AMW (Psychiatry) <input type="checkbox"/> REH-AMW (Rehabilitation) <input type="checkbox"/> GER-AMW (Geriatrics) <input type="checkbox"/> LTC-AMW (Long-Term care) <input type="checkbox"/> OBG-AMW (gynaecology-obstetrics)	<input type="checkbox"/> ASW (General or mixed Adult Surgical Ward) <input type="checkbox"/> DIG-ASW (Digestive tract surgery) <input type="checkbox"/> ORT-ASW (Orthopaedics-Trauma surg.) <input type="checkbox"/> URO-ASW (Urological surg.) <input type="checkbox"/> CV-ASW (Cardio-vascular surg.) <input type="checkbox"/> NEU-ASW (Neurosurgery) <input type="checkbox"/> ONCO-ASW (Oncology-cancer surg.) <input type="checkbox"/> PLAS-ASW (Plastic, reconstructive surg.) <input type="checkbox"/> ENT-ASW (Ear-nose-throat surg.) <input type="checkbox"/> AICU (General or mixed Adult Intensive Care Unit) <input type="checkbox"/> MED-AICU (Medical AICU) <input type="checkbox"/> SUR-AICU (Surgical AICU) <input type="checkbox"/> CAR-AICU (Cardiac AICU)	<input type="checkbox"/> PMW (Paediatric Medical Ward) <input type="checkbox"/> HO-PMW (Haematology-Oncology) <input type="checkbox"/> T-PMW (Transplant (BMT/Solid)) <input type="checkbox"/> PSW (Paediatric Surgical Ward) <input type="checkbox"/> PICU (Paediatric Intensive Care Unit) <input type="checkbox"/> ID-PMW (Infectious Disease PMW) Neonatal wards: <input type="checkbox"/> NMW (Neonatal Medical Ward) <input type="checkbox"/> NICU (Neonatal Intensive Care Unit)		
Mixed Ward	<input type="checkbox"/> Yes <input type="checkbox"/> No				
Activity: Tick as appropriate. In case of mixed wards, tick all encountered activities/specialities			<input type="checkbox"/> Medicine	<input type="checkbox"/> Surgery	<input type="checkbox"/> Intensive Care
Total number of <u>admitted</u> inpatients (=all patients whether they receive an antimicrobial or not !) on the ward present at 8.00 am on day of PPS. For mixed departments, fill the total number of patients corresponding to each of the encountered activities.					
Total number of beds on the ward present at 8:00 am on day of PPS split up by activity. For mixed departments fill in the total number of beds corresponding to each of the encountered activities.					
The next section is to be filled in 'only' if you are participating in the Healthcare-Associated Infections (HAI) module					
Total number of "admitted" inpatients with one of the following "inserted" invasive devices at 8:00 am on day of PPS	Indwelling Urinary Catheter (UC)				
	At least one peripheral vascular catheter (PVC)				
	Central vascular catheter, no implantable venous port (CVC)				
	Non-invasive mechanical ventilation (CPAP, BiPAP)				
	Invasive respiratory endotracheal intubation (IRI) ¹				
	Inserted tubes and drains (T/D) ²				

Optional field
for HAI
module

¹ Include tracheostomy

² Inserted tubes and drains: include patients with nephrostomy tubes, intra-abdominal tubes and drains, cerebrospinal fluid shunts etc.





Global-PPS & optional HAI module

Patient form

- Detailed data (Numerator) collected only for patients on at least one antimicrobial (**Basic Global-PPS**)
 - ✓ Patient data : age, gender, weight
 - ✓ Antimicrobial prescription data : agent, dose, RoA, diagnosis, indication
 - ✓ Set of quality indicators: reason in notes, stop/review date written in notes, guideline compliance
 - ✓ Microbiology data : targeted versus empiric use, AMR data (micro-organism and resistance type)

- Patient HAI form (**optional HAI module**)
 - ✓ Presence of invasive devices : use of vascular & urinary catheters, endotracheal intubation, tubes & drains
 - ✓ Comorbidity



Global-PPS & optional HAI module

Patient basic form

GLOBAL-PPS **PATIENT Form** (Mandatory: Fill in one form per patient with an ongoing antimicrobial at 8am on the day of the PPS)

Ward Name/code	Activity ¹ (M, S, IC)	Patient Identifier ²	Survey Number ³	Patient Age ⁴			Current Weight ^a In kg	Neonate only (optional)		Gender M, F, U
				Years (if ≥ 2 years)	Months (1-23 month)	Days (if <1 month)		Gestational age^a	Birth weight ^a (kg)	

Treatment based on biomarker data or WBC		0 Yes – 0 No		Culture(s) sent to the lab to document infection* (Tick if yes)		
If yes, which: CRP, PCT, other or WBC ⁵	Type biological fluid sample (Blood/urine/ other)		Most relevant value close to start antimicrobial Value Unit ⁶	<input type="checkbox"/> Blood	<input type="checkbox"/> Cerebrospinal fluid	<input type="checkbox"/> BAL (protected resp. specimen)
				<input type="checkbox"/> Urine	<input type="checkbox"/> Wound (surgery/biopsy)	<input type="checkbox"/> Sputum/bronchial aspirate
						<input type="checkbox"/> Other type of specimen

Antimicrobial Name ⁷	1.	2.	3.	4.	5.
Start date of the antimicrobial* (dd/mm/yyyy)					
Single Unit Dose ⁸	Unit (g, mg, IU, MU) ⁹				
Doses/ day ¹⁰	Route (P, O, R, I) ¹¹				
Diagnosis ¹² (see appendix II)					
Type of indication ¹³ (see appendix III)					
Reason in Notes (Yes or No) ¹⁴					
Guideline Compliance (Y, N, NA, NI) ¹⁵					
Is a stop/review date documented?(Yes/No)					

Treatment (E: Empirical; T: Targeted) ¹⁶										
The following resistance data is to be filled in only if the treatment choice is based on microbiology data (Treatment=T) available on the day of the PPS										
Maximum 3 microorganisms (MO) to report	MO	R type**	MO	R type**	MO	R type**	MO	R type**	MO	R type**
Maximum 1 Resistance type by MO to report										
Insert codes (see Appendix IV, page 9)	MO 1									
	MO 2									
	MO 3									

Resistance type** - choose between: MRSA¹⁷; MRCoNS¹⁸; PNSP¹⁹; MLS²⁰; VRE²¹; ESBL (ESBL-producing Enterobacterales²²); 3GCREB (3rd generation cephalosporin resistant Enterobacterales); CRE (Carbapenem-resistant Enterobacterales²³); ESBL-NF (ESBL-producing non fermenter Gram-negative bacilli²⁴); CR-NF (Carbapenem-resistant non fermenter Gram-negative bacilli²⁵); other MDRO²⁶; Azoles²⁷. Encode Microorganism also if resistance type is unknown.

Note: * Current weight, Gestational age (in number of weeks), Birth weight, Start date of the antimicrobial and Cultures sent to the lab are optional variables.



Global-PPS & optional HAI module

Patient HAI form

GLOBAL-PPS **PATIENT Form** – additional variables for HAI at patient level (optional)

(Fill in one form per patient with an ongoing antimicrobial at 8am on the day of the PPS – more info on definitions in protocol, page 20)

Ward Name/code	Activity ¹ (M, S, IC)	Patient Identifier ²	Survey Number ³	Patient Age ⁴			Current Weight* In kg	Neonate only (optional)		Gender M, F, U
				Years (if ≥ 2 years)	Months (1-23 month)	Days (if <1 month)		Gestational age*	Birth weight* (kg)	

Date of admission in the hospital (dd/mm/yyyy) (optional)					Surgical procedure during current admission in hospital	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> UNK
Previous hospitalization < 3 months (optional)	<input type="checkbox"/> Yes, ICU	<input type="checkbox"/> Yes, other	<input type="checkbox"/> No	<input type="checkbox"/> UNK	Previous antibiotic treatment <1 month (optional)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> UNK

"Inserted" invasive device present at 8 am on the day of the PPS				Date 1 st insertion/start (optional)
Indwelling Urinary Catheter (UC)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> UNK	___/___/___
Peripheral Vascular Catheter (PVC)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> UNK	___/___/___
Central Vascular Catheter, no implantable venous port (CVC)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> UNK	___/___/___
Non-invasive mechanical ventilation (CPAP, BiPAP)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> UNK	___/___/___
Invasive respiratory endotracheal intubation (IRI) ⁱ	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> UNK	___/___/___
Inserted tubes and drains (T/D) ⁱⁱ	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> UNK	___/___/___

McCabe score	<input type="checkbox"/> Non-fatal disease
	<input type="checkbox"/> Ultimately fatal disease
	<input type="checkbox"/> Rapidly fatal disease
	<input type="checkbox"/> UNK/Not available

Underlying morbidity (multiple choice, maximum 3 choices)	<input type="checkbox"/> Diabetes mellitus, type 1 or 2	<input type="checkbox"/> Genetic disorder	<input type="checkbox"/> End-stage Liver Disease, cirrhosis
	<input type="checkbox"/> AIDS/HIV (only if last CD4 count <500/mm ³)	<input type="checkbox"/> Congenital heart diseases	<input type="checkbox"/> Trauma
	<input type="checkbox"/> Hematological or solid cancer/ Recent chemotherapy (<3months)	<input type="checkbox"/> Chronic lung diseases including cystic fibrosis, COPD, bronchiectasis, asthma	<input type="checkbox"/> Gastroenterological disease (inflammatory bowel disorders, Coeliac disease,...)
	<input type="checkbox"/> Stem cell or solid organ transplant	<input type="checkbox"/> Neutropenia	<input type="checkbox"/> Chronic neurological conditions ⁱⁱⁱ
	<input type="checkbox"/> Chronic Renal Disease (all stages)	<input type="checkbox"/> High dose steroids ^{iv}	<input type="checkbox"/> Other
	<input type="checkbox"/> Tuberculosis	<input type="checkbox"/> Malnutrition ^v	<input type="checkbox"/> None
			<input type="checkbox"/> Unknown



Global-PPS & optional HAI module

Method in a nutshell

- Web-based data entry, verification, validation and reporting with the help of the Global-PPS tool
- Protocol and data collection templates available at <https://www.global-pps.com/documents/>





Real-time feedback of results to the sites

- ❏ Extraction of raw data allowing verification and analysis of your hospital results (excel file).
- ❏ Generation of simple, easy to use feedback reports on hospital data ready to use for local presentations: PDF
 - **One point feedback** comparing the hospital site results to average results for the country (if at least 3 participating hospitals from the country), region (continental results) and Europe.
 - **Longitudinal feedback** : multiple participation
 - **Merged feedback** : merged results for a set of hospital sites



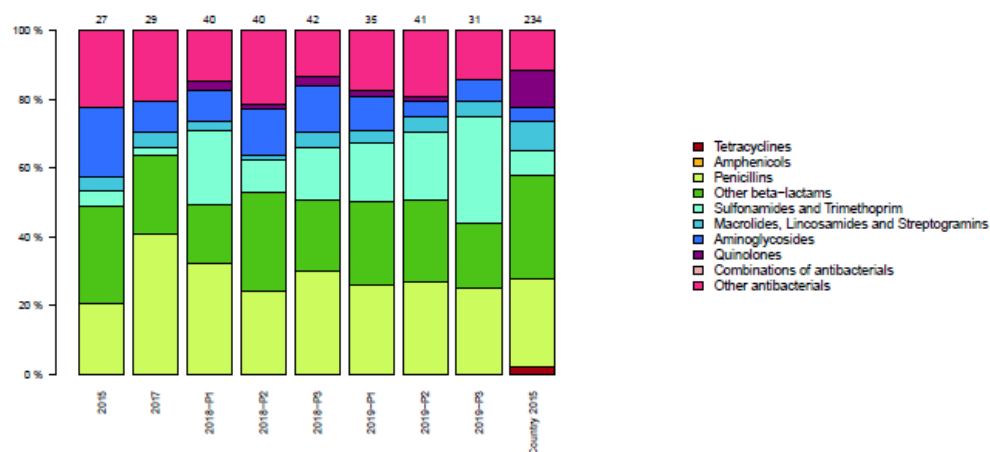
Real-time feedback of results to the sites, an example

- Sites participating multiple times (at least two times) receive a **longitudinal feedback report** for the time points they participated (2015, 2017, 2018, 2019, 2020, ...).

Overall antimicrobial prevalence by region and type of child or neonatal ward

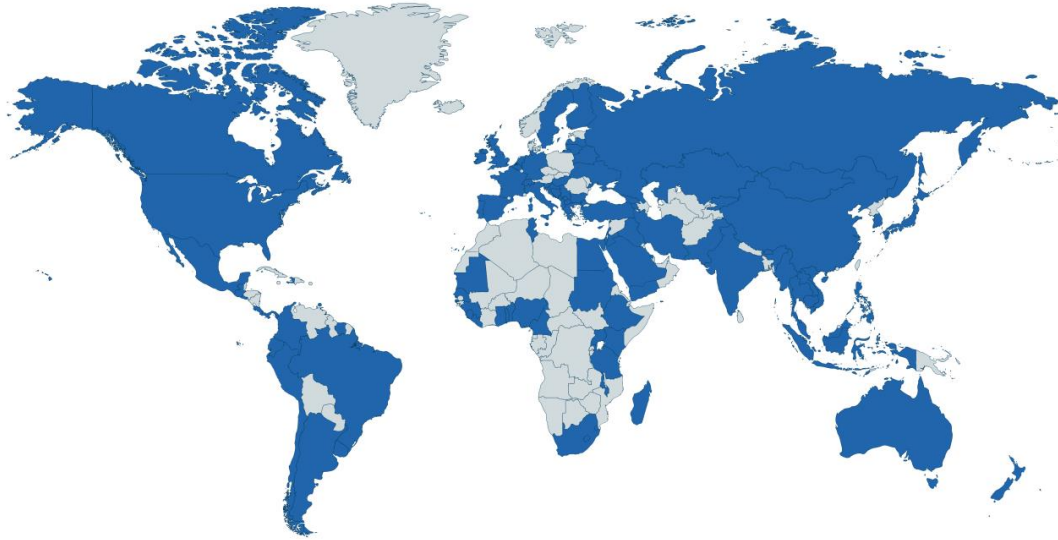
	Total	PMW	HO-PMW	T-PMW	PSW	PICU	NMW	NICU
Our hospital 2015	34.6	34.2	41.7	0.0	0.0	50.0	14.3	50.0
Our hospital 2017	37.5	37.0	30.0	0.0	0.0	50.0	20.0	60.0
Our hospital 2018-P1	51.3	39.5	100.0	0.0	0.0	100.0	33.3	42.9
Our hospital 2018-P2	51.3	42.9	61.5	0.0	0.0	100.0	36.4	75.0
Our hospital 2018-P3	47.7	39.6	100.0	0.0	0.0	100.0	27.8	63.6
Our hospital 2019-P1	46.1	39.0	87.5	0.0	0.0	100.0	26.7	50.0
Our hospital 2019-P2	62.7	62.2	100.0	0.0	0.0	50.0	0.0	71.4
Our hospital 2019-P3	38.8	26.8	100.0	0.0	0.0	66.7	8.3	36.4
country (6 hospitals)								
patients 2015 (N)	184	90	28	0	0	12	28	26
treated patients 2015 (%)	32.1	25.6	75.0	0.0	0.0	33.3	10.7	30.8

Overall proportional antibiotic use





Results - Main findings of the Global-PPS



**Nearly 1,350 hospital
participations
85 different countries
± 300,000 patients**

Most common observations and conclusions (articles, abstracts, congresses):

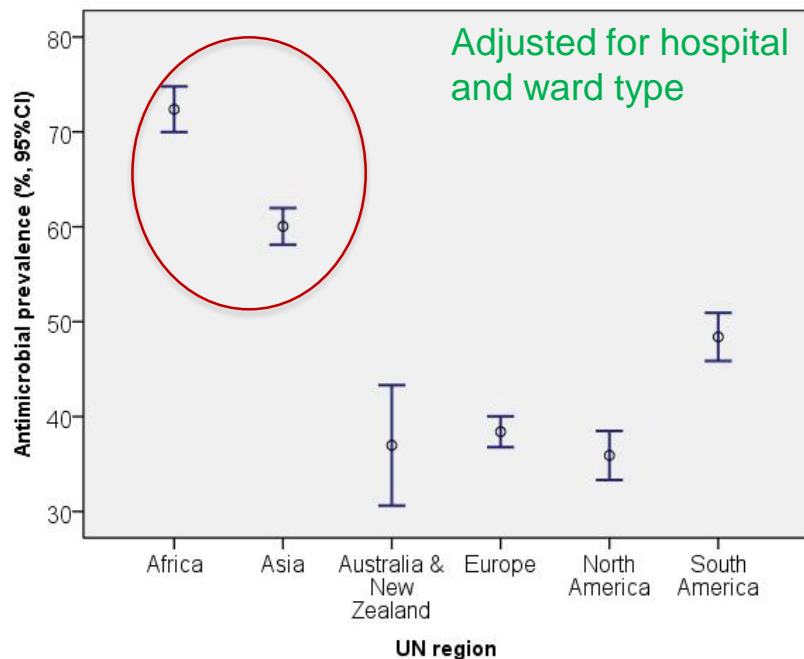
- High rates of antimicrobial prescribing
- Broad-spectrum prescribing
- Mainly empirical use
- Prolonged surgical prophylaxis
- Absence of guidelines
- Low reporting of stop/review date

<https://www.global-pps.com/dissemination/congresses/>

and

<https://www.global-pps.com/dissemination/peer-reviewed-articles/>

Antimicrobial prevalence (%) worldwide (2017-2018 data)



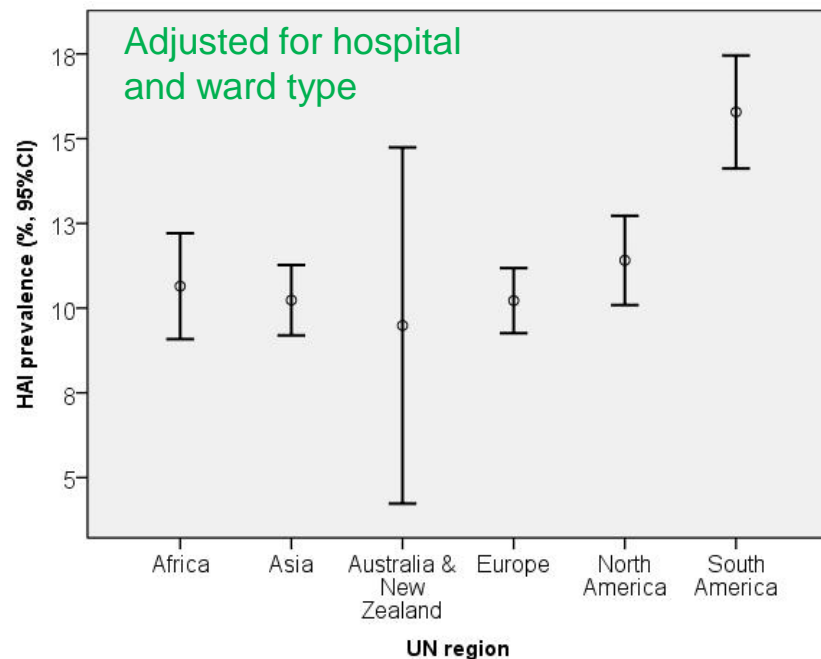
Average of AMU%

Crude prevalence

region	Mean	N	Std. Deviation
Africa	71,478	115	19,3634
Asia	57,159	163	21,6869
Australia & New Zealand	33,045	9	10,4090
Europe	31,580	175	12,6879
North America	32,313	65	9,1142
South America	49,637	84	15,6419
Total	48,496	611	22,7520

N= number of hospitals

HAI prevalence (%) worldwide (2017-2018 data)



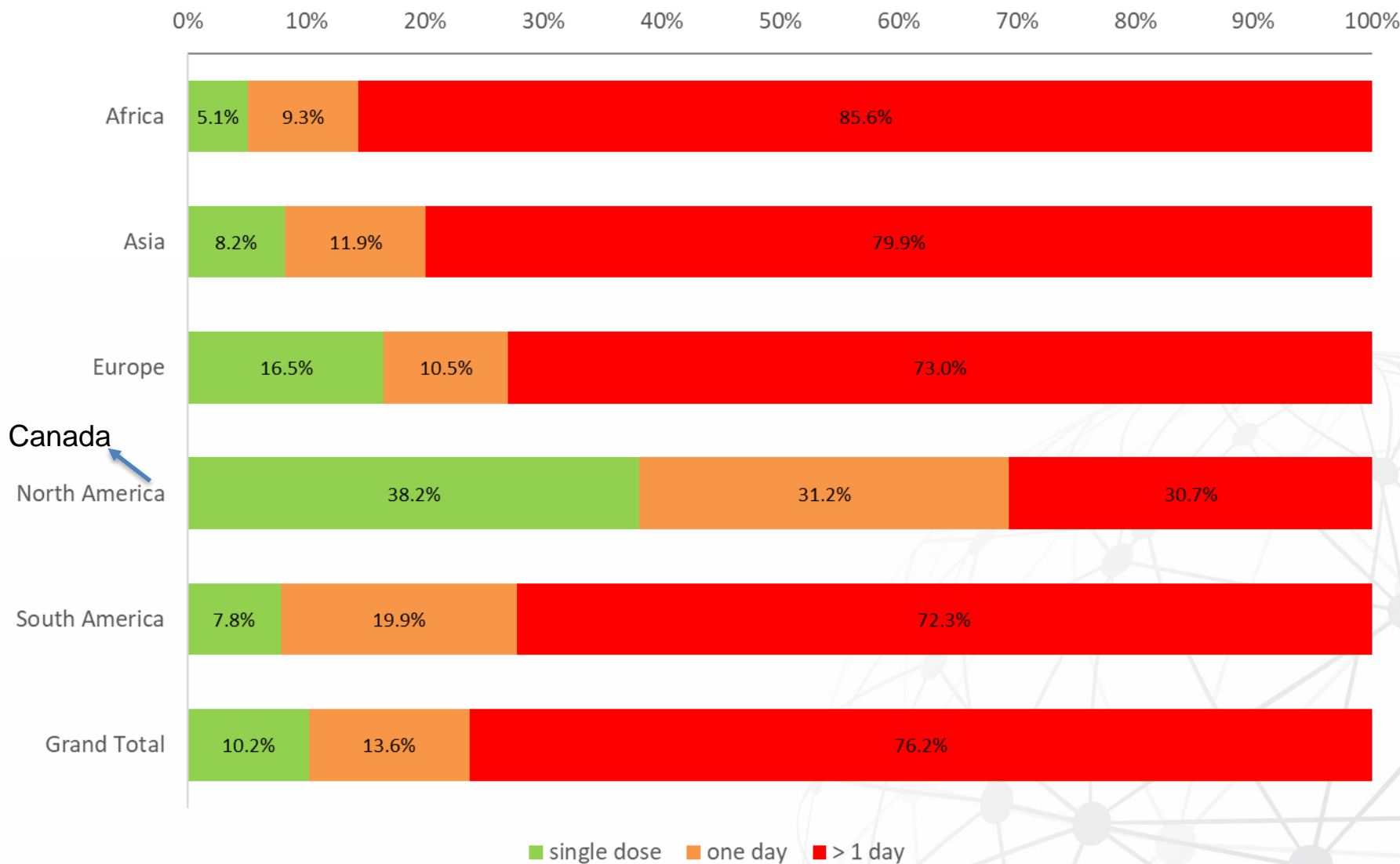
Average of HAI%

Crude prevalence

region	Mean	N	Std. Deviation
Africa	8,027	115	11,5741
Asia	7,143	163	6,1015
Australia & New Zealand	8,989	9	6,7190
Europe	7,331	175	5,6518
North America	10,324	65	4,1403
South America	15,513	84	11,0272
Total	8,879	611	8,4191



Surgical prophylaxis duration (2018)





**GLOBAL POINT PREVALENCE SURVEY
OF ANTIMICROBIAL CONSUMPTION
AND RESISTANCE (GLOBAL-PPS)**



Iranian Global-PPS Database

With thanks to driving
force

Prof. Jafar Soltani

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The WHO Access, Watch, Reserve (AWaRe) classification

➤ ***Aim: support countries and hospitals in promoting rational use of antibiotics while improving access to these essential medicines.***

⬡ **Access group :**

- 1st or 2nd line agents for empiric treatment of common infectious syndromes
- Should be widely available and affordable (amoxicillin, cefazolin, cloxacillin, ...)

⬡ **Watch group :**

- Higher risk of selecting for resistance ; used as 1st or 2nd options for a limited number of indications (2nd & 3rd gen. cephalosporins, carbapenems, quinolones, ...).
- Need monitoring and prioritising as targets for stewardship programmes.

⬡ **Reserve group :**

- Includes last-resort antibiotics (colistin, tigecycline, fosfomycin IV, daptomycin, ...)
- Need to be intensively monitored; should only be used under certain specific conditions in order to conserve their effectiveness.

⬡ **Not recommended :**

- Added for fixed-dose combinations of broad-spectrum antibiotics for which the use is not evidence-based; not endorsed in clinical practice.

See https://www.who.int/medicines/news/2019/WHO_releases2019AWaRe_classification_antibiotics/en/

Trends of antibiotic prescriptions (ATC J01) in Iran according to the AWARe classification (2011-2019)

Antibiotic prescriptions on **child wards**

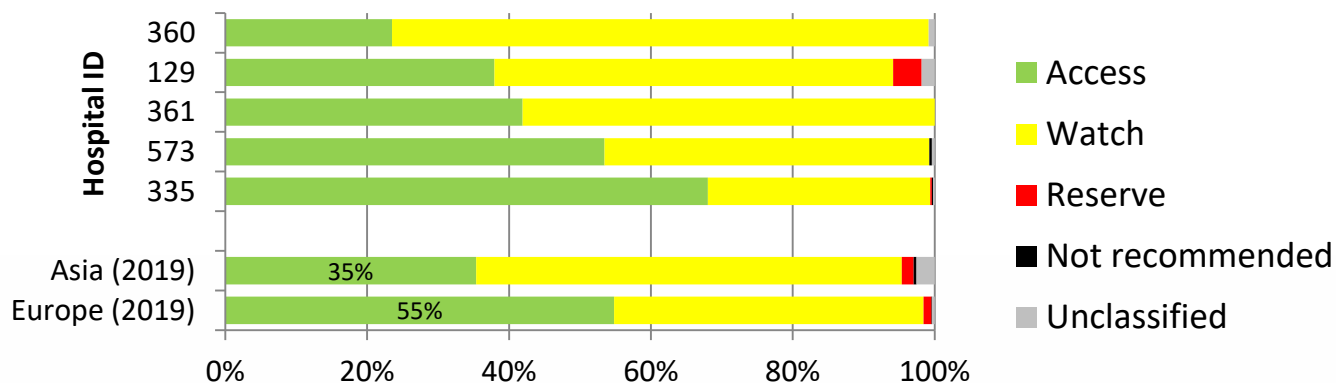


2011 - 2012 = ARPEC data

2015 - 2019 = Global-PPS data

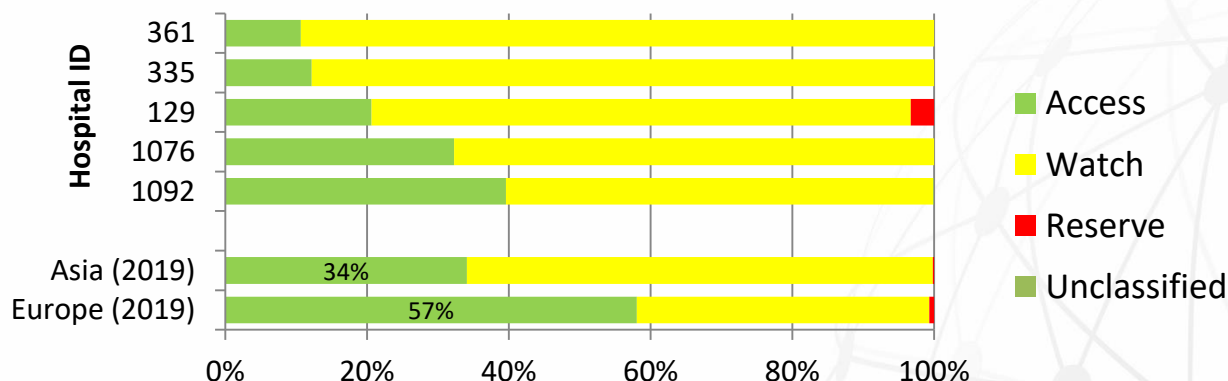
Antibiotic prescriptions (ATC J01) in Iran according to the AWaRe classification (2011-2019)

Antibiotic prescriptions on **adult wards**



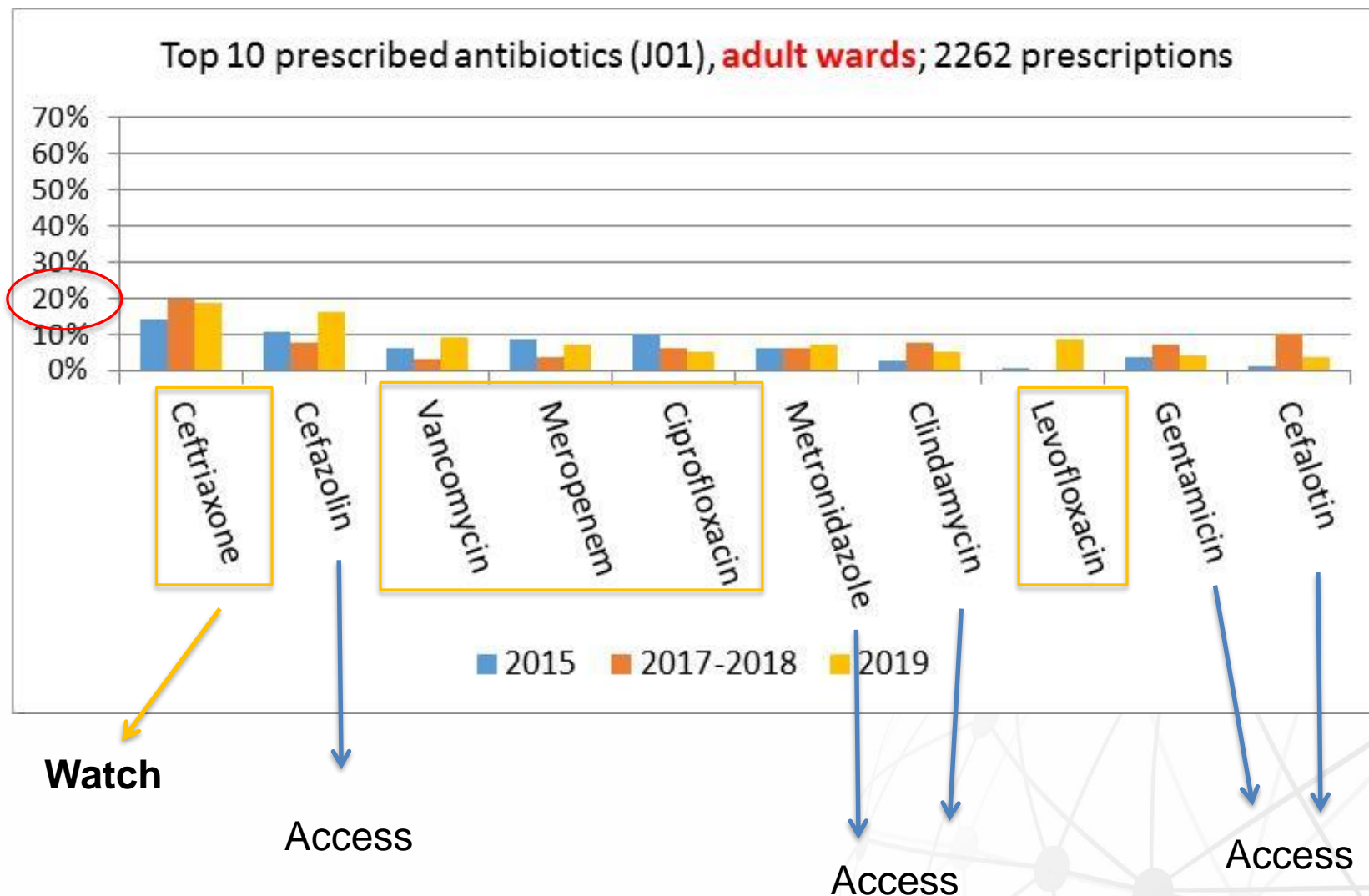
Iran: 2262 prescriptions; ***Asia 2019:*** 14,520 prescriptions; ***Europe 2019:*** 7434 prescriptions

Antibiotic prescriptions on **child wards**



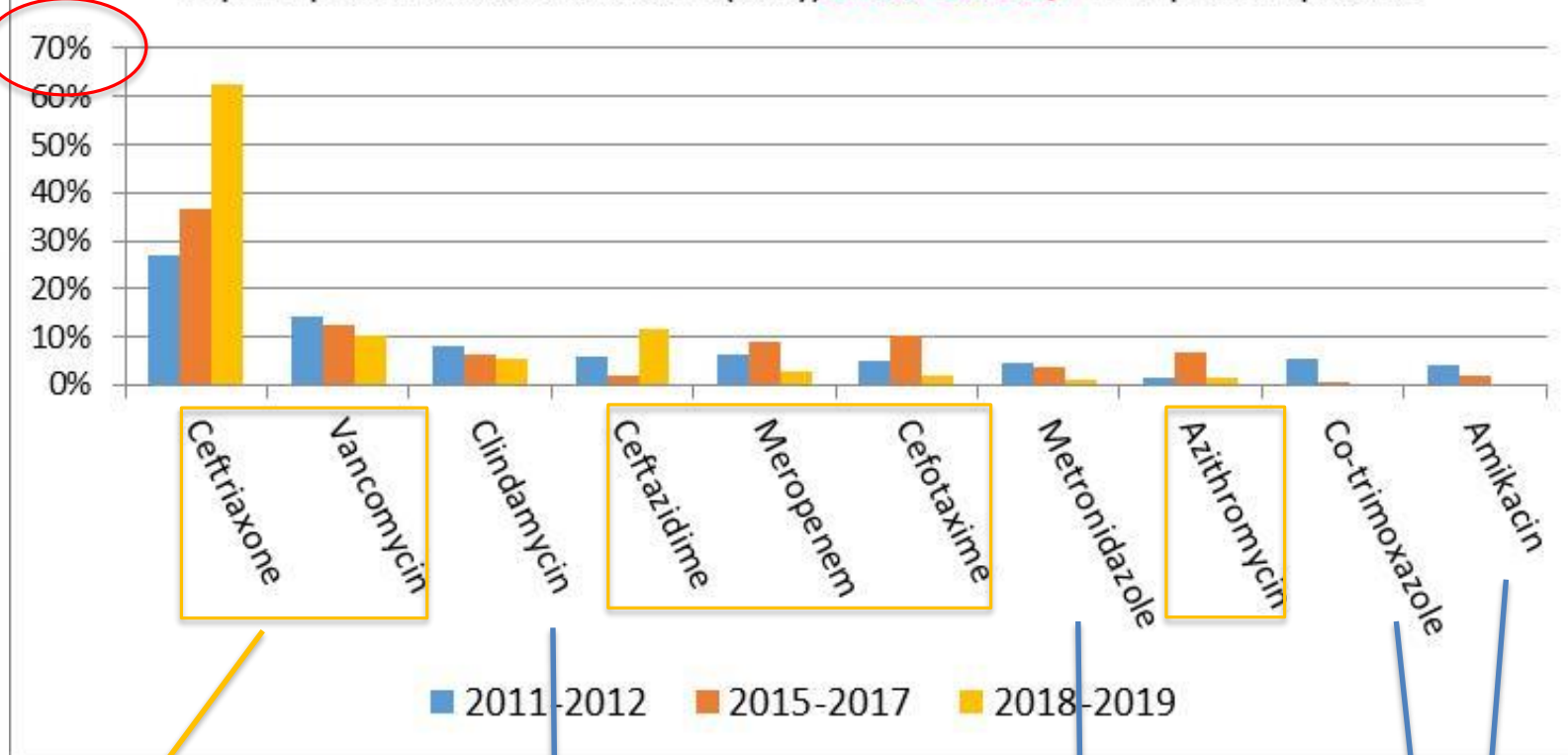
Iran: 1127 prescriptions; ***Asia 2019:*** 4165 prescriptions; ***Europe 2019:*** 364 prescriptions

Top 10 prescribed antibiotics in time (Adult wards; 2015-2019)



Top 10 prescribed antibiotics in time (Child wards; 2011-2019)

Top 10 prescribed antibiotics (J01), **child wards**, 1127 prescriptions



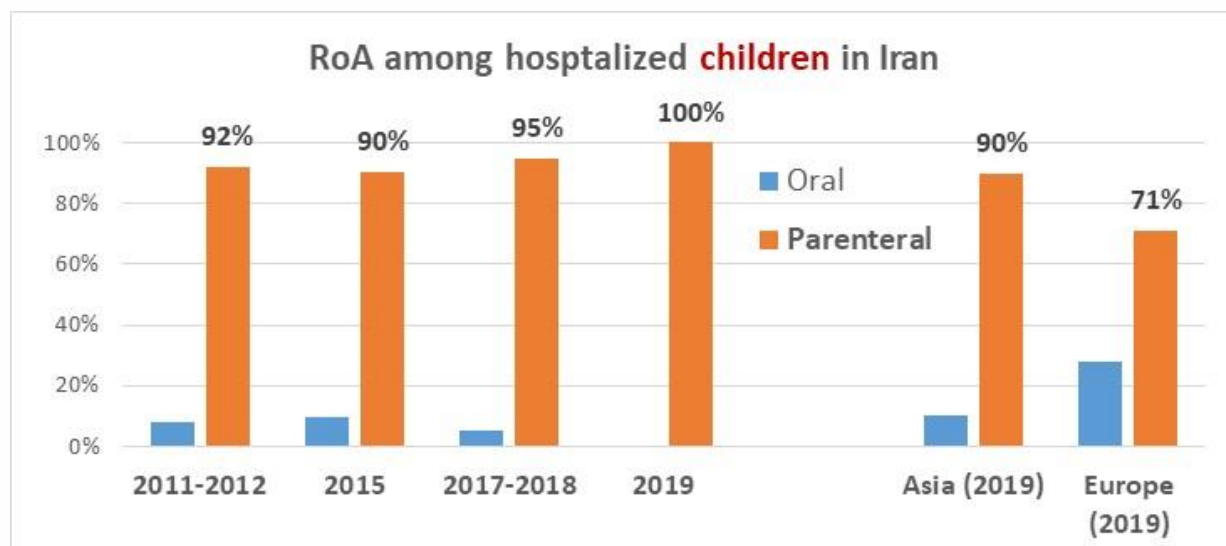
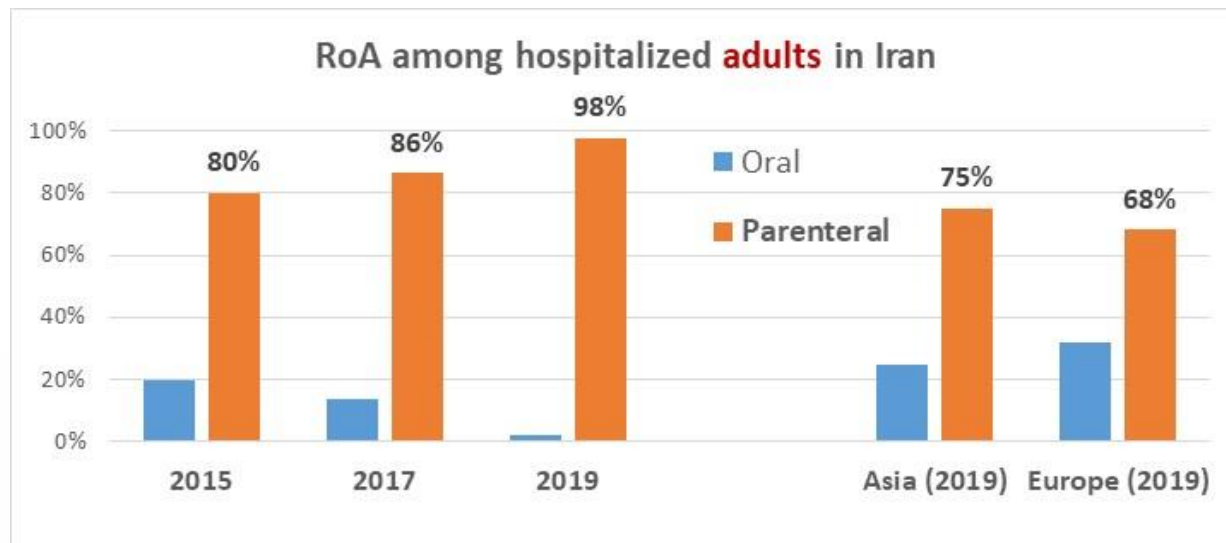
Watch

Access

Access

Access

Intravenous Route of Administration of antibiotics prevails in Iran



high use of IV antibiotics will result in high use of vascular catheters



Importance of Prevention of Intravascular Catheter-related infections



2011 - 2012 = ARPEC data
2015 - 2019 = Global-PPS data



Quality indicators for antibiotic use in Iran

Role of a nurse !

	Iran		West-Central Asia		Europe	
	N	%	N	%	N	%
Medical						
Reason in notes	226	85.9	6555	81.8	4431	89.4
Guidelines missing	2	0.8	445	5.6	263	5.3
Guideline compliant	54	26.9	4326	75.4	3313	83.5
Stop/review date documented	1	0.4	3709	46.3	2184	44.1
Surgical						
Reason in notes	153	97.5	2307	69.6	1635	80.1
Guidelines missing	1	0.6	481	14.5	108	5.3
Guideline compliant	0	0.0	1160	53.1	1282	79.0
Stop/review date documented	1	0.6	1301	39.3	1097	53.7
ICU						
Reason in notes	125	91.2	1679	76.4	645	84.2
Guidelines missing	0	0.0	223	10.2	64	8.4
Guideline compliant	8	11.3	855	68.2	455	85.8
Stop/review date documented	4	2.9	843	38.4	307	40.1



Results - Key messages

- ❏ Substantial differences in the prevalence of antibiotic prescribing within regions, with the highest prevalence in Africa and Asia.
- ❏ Highest HAI prevalence in Latin America.
- ❏ Prolonged surgical prophylactic prescribing is common, but exceptions at country level exist.
- ❏ Iran :
 - High use of Watch-Antibiotics : these agents are at a higher risk of selecting for resistance
 - Concordant with high broad spectrum prescribing, also and especially among children
 - ***These results show the need of monitoring and prioritising targets for stewardship programmes in Iran.***



GLOBAL POINT PREVALENCE SURVEY OF ANTIMICROBIAL CONSUMPTION AND RESISTANCE (GLOBAL-PPS)



The Global-PPS and Antimicrobial Stewardship

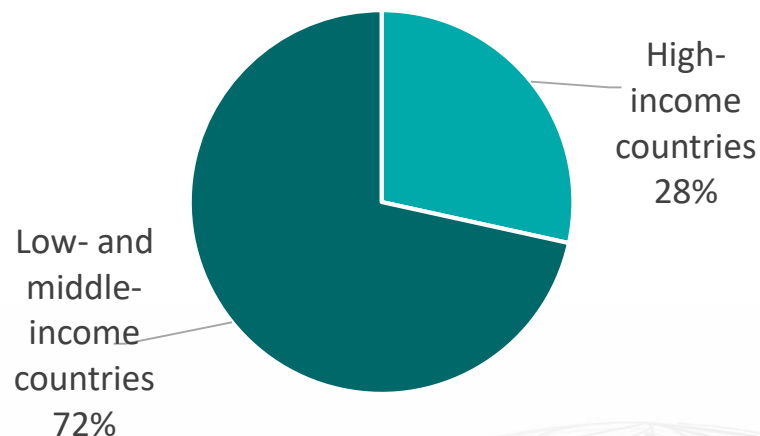
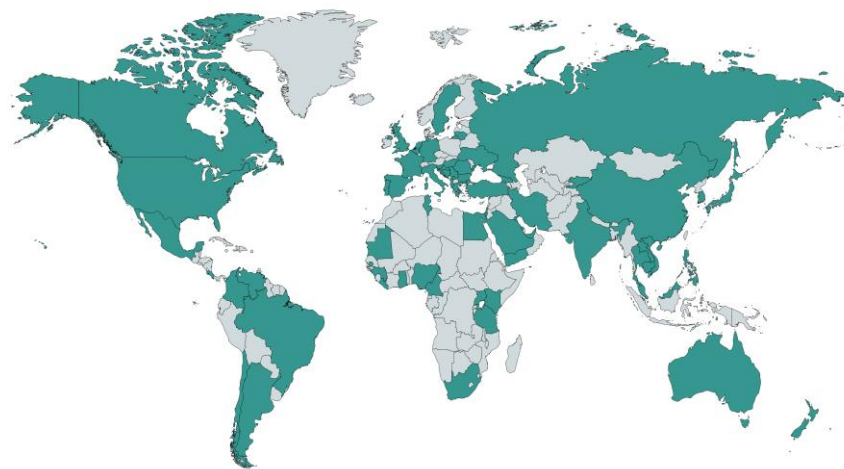
Some results of the stewardship survey

The Global-PPS is coordinated
by the University of Antwerp
and supported by bioMérieux

Stewardship survey: degree of participation

Survey participation

N respondents	211
Participated at least once in the Global-PPS	174
Did not (yet) participate in the Global-PPS	37
N countries	66



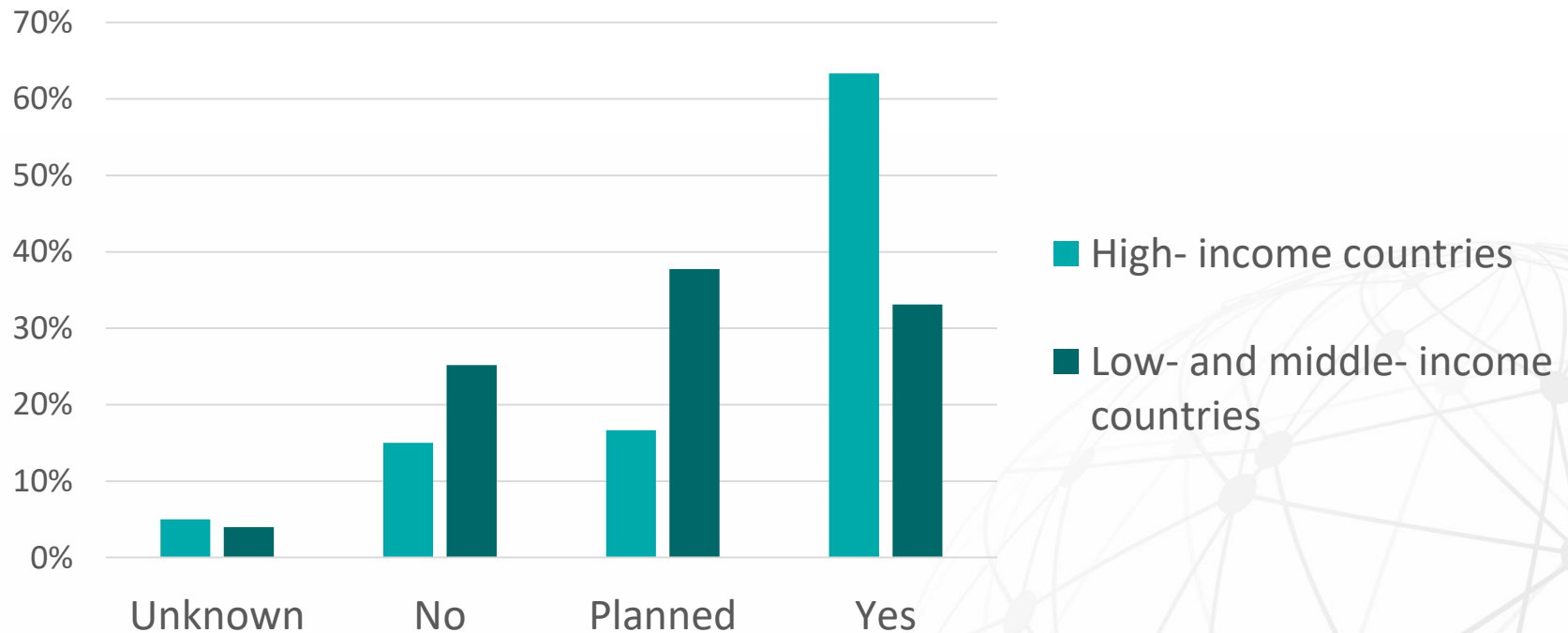
Top 10 countries

Country	N respondents
GEORGIA	18
NIGERIA	17
PHILIPPINES	15
CANADA	15
INDIA	14
RUSSIAN FEDERATION	13
MEXICO	9
BRAZIL	7
ITALY	5
SINGAPORE	5



Existing Antimicrobial Stewardship Activities

“Does your hospital have a **formal Antimicrobial Stewardship (AMS) strategy?**”



*This is a plan that describes the aims, milestones and outcome measures of stewardship activities in your hospital



Existing Antimicrobial Stewardship Activities

“Of the stewardship components currently in place in your hospital, please indicate the components that were **initiated as a result of the Global-PPS findings.**”

AMS component	% present in hospital (n=211)	% initiated as a result of Global-PPS (n=164)
Local, evidence-based guidelines (write or review)	68.2	36.6
Dedicated education and communication	49.3	27.4
An antimicrobial formulary	59.7	21.3
Specific interventions	39.3	17.1
An active AMS committee	49.3	16.5
An active AMS team	45.0	13.4
Use of information technology to support AMS	26.5	13.4
Other	7.1	3.7
No AMS activities	7.1	NA

70.1% (n=115) of respondents who participated in the Global-PPS and who have reported AMS activities state that at least one of these activities was initiated as a result of the Global-PPS



Antimicrobial stewardship : Top 5 barriers for implementation

“What are the **main barriers** to implement an effective AMS program in your hospital? Rank the barriers you selected according to how important they are.”

	High-income countries	
Rank	Barrier	Score
1	Qualified personnel does not have enough time to perform stewardship	2.7
2	Lack of funding	2.2
3	Lack of information technology support	1.3
4	Lack of knowledge on good prescribing practices among clinicians	1.0
5	Lack of qualified personnel	0.9
	Low- and middle-income countries	
Rank	Barrier	Score
1	Qualified personnel does not have enough time to perform stewardship	1.5
2	Lack of cooperation from prescribers	1.4
3	Lack of knowledge on good prescribing practices among clinicians	1.4
4	Insufficient microbiology laboratory capacity	1.3
5	Lack or unavailability of practical, evidence-based, local guidelines	1.2



Discussion – final thoughts

The nurse plays a role in antimicrobial stewardship activities through the **Global-PPS**

- Follow up simple antibiotic quality indicators
- Support dedicated education and communication
- Support interventions and measure impact through repeated PPS
- Change practice (sustainability !)

Opportunity to stimulate local networking



Ready to support us ?



Contact : Jafar Soltani at soltanjaf@hotmail.com

A photograph of a forest with many tall, thin, brown tree trunks. A dirt path winds through the trees, leading towards the background. The lighting is soft, and the overall tone is warm and slightly hazy.

Results are the product of
action, not by thoughts of
taking action.

Andy Wooten

**National Iranian PPS on Antimicrobial
Consumption and Resistance**

Contact : Jafar Soltani at soltanjaf@hotmail.com