Global Point Prevalence Survey of Antimicrobial Consumption and Resistance

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Supporting healthcare professionals in the fight against resistance

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Disclosures

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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."

What is Surveillance

World Health Organization:

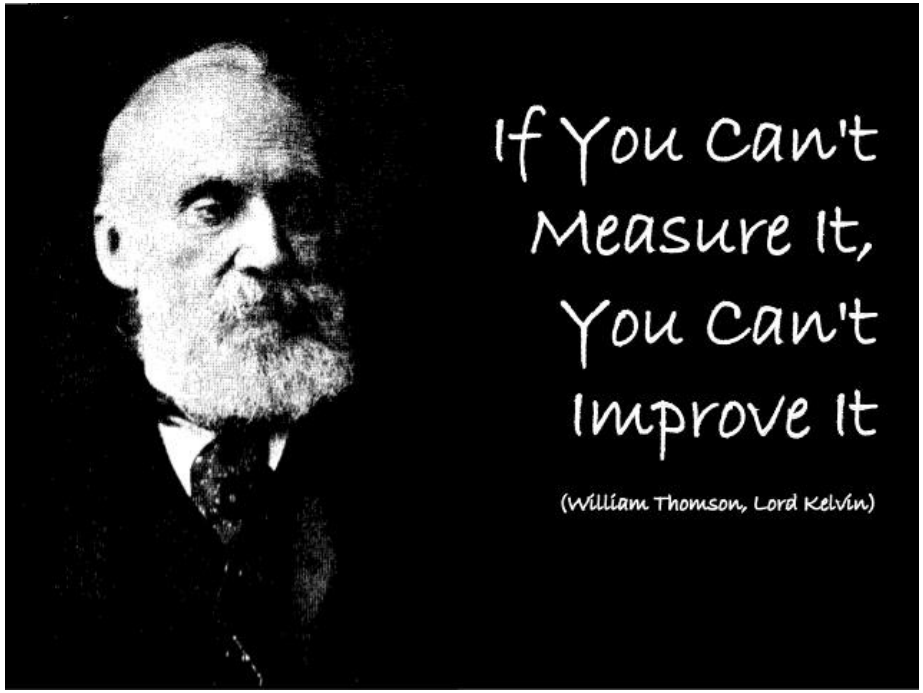
Systematic ongoing collection, collation, and analysis of data and the timely dissemination of information to those who need to know so that action can be taken.

U.S. Centers for Disease Control and Prevention:

The ongoing systematic collection, analysis, and interpretation of health data, essential to the planning, implementation, and evaluation of public health practice, closely integrated with the timely dissemination of these data to those who need to know.

Steps in surveillance

1. Recording of data
2. Data accumulation
3. Data analysis
4. Judgment and **action**



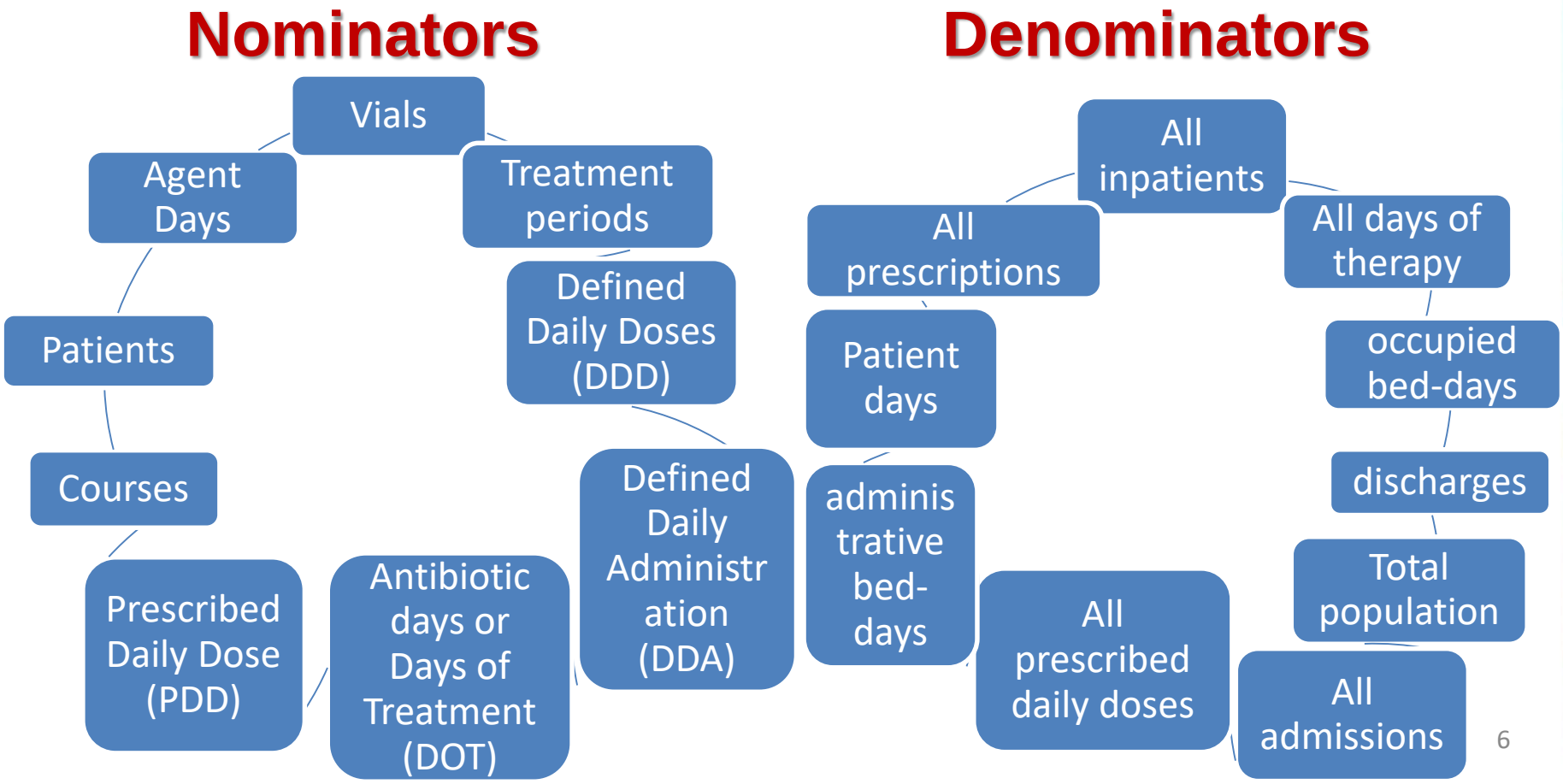
Antibiotic prescribing in hospitals - What does the literature offers ?

Different approaches for data collection; analysis and reporting of antibiotic use:

- proportions (%) of patients on antibiotics using a 1-day PPS design, retrospective, mixed retroprospective or prospective design with
- different time periods or intervals of data collection within a single hospital/between hospitals
- billing data to compare proportions of antibiotic use

Antibiotic prescribing in hospitals - What does the literature offers ?

Wide range of methods, with different numerators and denominators, which makes comparison difficult



What are the determinants of (in)appropriate antibiotic use?

- Patient related (diagnosis, age, underlying disease, ….)
- Prescriber related (training)
- Institutional factors (national/local policy, availability of drugs on market, existing guidelines, hospital type, ….)
- Social and cultural factors, custums, economic factors, ….
- Empowerment

➢ **Influences the quantity and quality of antibiotic prescribing**

Measure and compare

HOW TO INTERPRET ?

Golden standard ?

What do we need in hospitals ?

A standardized approach to uniformly report and compare data on antibiotic prescribing and resistance amongst adults, children and neonates and to analyze trends over time.

And… it should be a simple method

Why do we need a standardized approach ?

Collecting consistent, valid and comparable antimicrobial prescribing data is valuable !

Good news : What we need exists !

This hospital is participating in the **worldwide**
'GLOBAL POINT PREVALENCE SURVEY'
on Antibiotic Consumption and Resistance

What is it all about ?

- ✓ Data collection on antibiotic prescription patterns and resistance in the hospital
- ✓ Compare data nationally and worldwide
- ✓ Identify targets to improve antibiotic prescribing

Why?

- ✓ Continually improve healthcare quality
- ✓ Combat antibiotic resistance
- ✓ Improve antibiotic use for better patient health

Contact person: "enter name and/or department"

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Supporting healthcare professionals in the fight against resistance

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Background - History

European Surveillance of Antimicrobial Consumption (ESAC)

1. **Outpatient AMU**: national wholesales data, now ***ESAC-Net***
2. **Inpatient antimicrobial use:**
   - ESAC-PPS in acute care hospitals (2006, 2008, 2009)
   - ESAC-PPS in nursing homes (2007, 2009)
     - ***Now HAI-Net***=ECDC-PPS on health care associated infections (2012-2017) (see: https://ecdc.europa.eu/en/about-us/partnerships-and-networks/disease-and-laboratory-networks)
   - ARPEC-PPS in 2011-2012 (children/neonates); GARPEC in 2015-2017
   - 4th edition World HAI Forum on healthcare-associated infections and antimicrobial resistance, June 2013 - Annecy, France
     - 10 priority actions among which "worldwide PPS on antibiotic use in hospitals" http://www.biomerieux.com/en/4th-world-hai-forum-antimicrobial-resistance

Global-PPS 2014 (pilot), 2015 & 2017

See: https://www.thelancet.com/journals/langlo/article/PIIS2214-109X(18)30186-4/fulltext

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 Caniaux, 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 resistance from hospitals worldwide, which were grouped by UN region. The internet-based survey included all inpatients (adults, children, and neonates) receiving an antimicrobial who were on the ward at 0800 h on one specific day between January and September, 2015. Hospitals were classified as primary, secondary, tertiary (including infectious diseases hospitals), and paediatric hospitals. Five main ward types were defined: medical wards, surgical wards, intensive-care units, haematology oncology wards, and medical transplantation (bone marrow or solid transplants) wards. Data recorded included patient characteristics, antimicrobials received, diagnosis, therapeutic indication according to predefined lists, and markers of prescribing quality (eg, whether a stop or review date were recorded, and whether local prescribing guidelines existed and were adhered to). We report findings for adult inpatients.

Lancet Glob Health 2018; 6: e619–29

Published Online April 19, 2018 http://dx.doi.org/10.1016/S2214-109X(18)30186-4

*Members listed at the end of the paper

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

Aims Global-PPS

- Determine the variation in drug, dose and indications of antimicrobial prescribing in hospitalized adults, children and neonates locally and regionally across countries & continents.
- Identify targets to improve quality of antimicrobial prescribing → improve healthcare quality and promote prudent antimicrobial use.
- Assess effectiveness of interventions through repeated PPS.
- Increase public health capacity.
- Combat antimicrobial resistance.

What do we offer

1. Protocol
2. Data collection templates - paper forms
   - Department (Ward) form (denominator data)
   - Patient form (numerator data)

Uniform data collection : Pre-defined variables

Standardised data management and analyses

What do we offer, next

3. Web-based data-entry, verification, validation and reporting through the Global-PPS programme.

- Structured data-entry (step by step) using drop down boxes
- In-built checks to ensure valid data-entry
- Continued verification on site through excel (raw data)
- Validation procedure providing warnings and/or errors

URL:

http://app.globalpps.uantwerpen.be/globalpps_webpps/

What do we offer: Real-time feedback of results to the sites

- A comprehensive feedback report (45 pages) is provided to each hospital
  - Compares hospital results to average results for the country (if at least 3 participating hospitals), region (e.g. Africa) and Europe
  - Anonymous feedback available at http://www.global-pps.com/documents/)
- Sites participating for the second or third time receive longitudinal results for the time points in 2015, 2017 & 2018
- Your raw own hospital data in Excel (verification, validation, analyses purposes)

What do we offer: Full support to hospitals

- Supply of materials to conduct the survey
  - Translated protocol or data collection forms
    (English, French, Japanese, Portugese, Russian, Serbian, Spanish, Arabic, Persian, …)
  - The antimicrobial list following the WHO ATC/DDD classification system (excel file) (ref: https://www.whocc.no/)
  - PPT slides on the method used (EN, FR)
  - The Frequently Asked Questions list
  - The IT-manual
  - Global-PPS poster and leaflet : promote the study in the participating hospital (different versions, easy to translate)

    Available at http://www.global-pps.com/
- Help desk : global-pps@uantwerpen.be
- All of the above = freely available

What we continuously do:

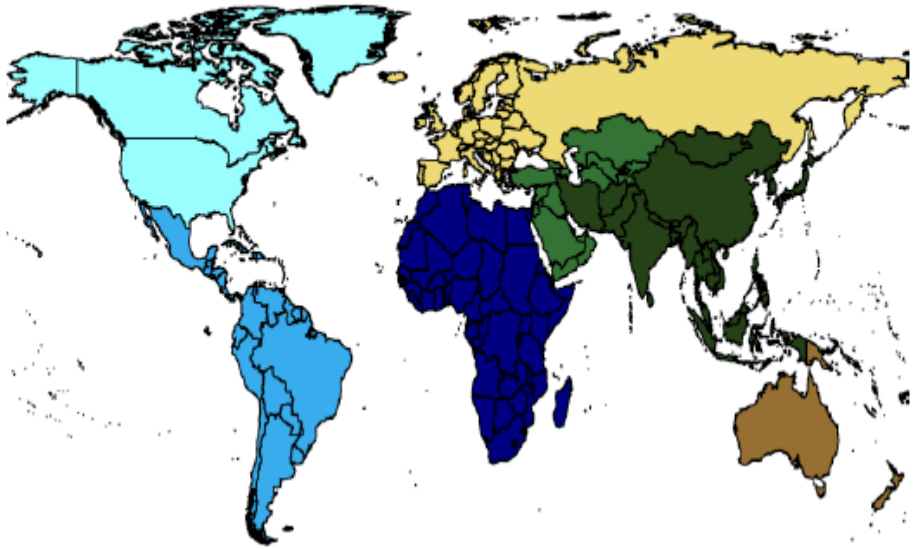
- Guarantee of **data privacy**
  - Complete anonymous patient data-entry
  - Data are property of the respective hospital
  - Hospital names will never be revealed in any report or publication
- Promotion of study, recruitment of hospitals
- **Evaluation** questionnaire
- **Continuous support** towards participating networks and partners regarding writing abstracts, presentations, communications, writing articles.
- Publication policy available on request

What needs to be done at hospital level - Organizational process -

- Allocation of local Global-PPS administrator
- Creation of multidisciplinary team
  - bring together clinicians from different specialties, pharmacist, (data)nurses, …
- Ethical approval if necessary
- Spend some time to learn “this feasible and easy to implement method”
- Get in touch : global-pps@uantwerpen.be

Degree of participation 2017 Global-PPS

	Number of countries	Number of hospitals
North America	2	18
South America	7	52
Africa	5	45
Europe	19	118
West & Central Asia	5	37
East & South Asia	9	71
Australia & New Zealand	1	5



North America
Latin America
Africa
West & Central Asia
East & South Asia
Europe
Australia & New Zealand

Participation of African countries to the Global-PPS in 2015, 2017 and/or 2018

Degree of participation in 2017

	N hospitals
EGYPT	17
GUINEA	14
NIGERIA	10
SOUTH AFRICA	3
TUNISIA	1
Total	45

Overall antimicrobial prevalence (%) by region and type of adult ward, year 2017

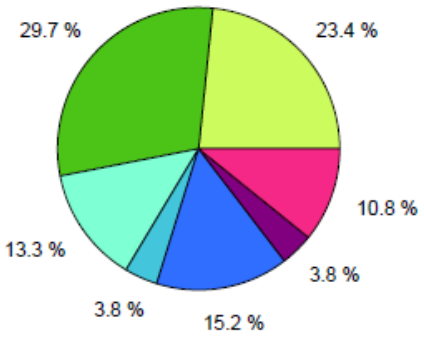
	Total	AMW	HO-AMW	T-AMW	P-AMW	ASW	AICU
North America	35.0	29.3	41.4	79.7	53.7	38.5	45.2
South America	43.7	40.9	41.9	77.3	51.9	39.9	60.5
Africa	59.1	60.8	69.3	66.7	50.0	55.3	73.8
North Europe	31.5	25.0	29.1	69.2	42.9	35.9	51.4
West Europe	27.1	22.5	44.3	85.0	43.7	28.1	51.0
South Europe	37.4	31.5	42.3	91.7	50.1	37.9	65.5
East Europe	23.1	12.8	33.7	75.0	44.3	26.7	58.6
West & Central Asia	37.2	30.0	45.9	0.0	0.0	36.6	58.9
East & South Asia	47.7	45.2	43.0	85.3	48.9	47.5	64.2
Australia & New Zealand	33.5	30.4	60.0	0.0	0.0	45.9	0.0

Antimicrobial prevalence (%): 100*(number of treated patients/number of registered patients according to UN macro-geographical subregions).
Total = Overall antimicrobial prevalence in adult wards; AMW = Adult Medical Ward; HO-AMW = Haematology-Oncology AMW;
T-AMW = Transplant (BMT/solid) AMW; P-AMW = Pneumology AMW; ASW = Adult Surgical Ward; AICU = Adult Intensive Care Unit.

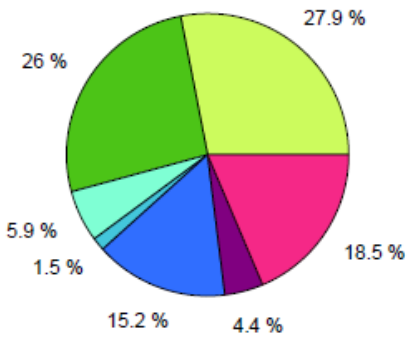
Overall proportional antibiotic use (ATC J01)

Example of Feedback

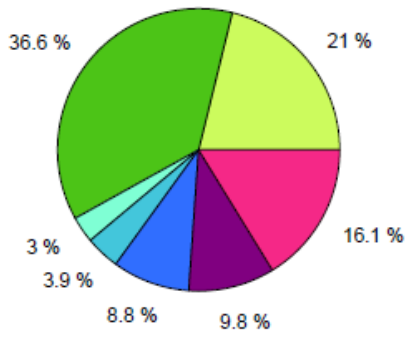
Our hospital (N= 102 treated patients)



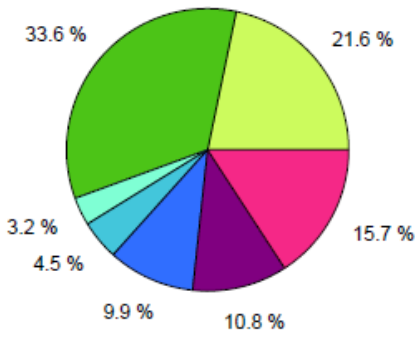
Country (n= 14 hospitals)



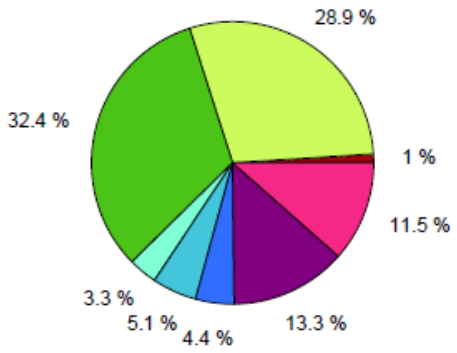
Continent (n= 45 hospitals)



Hospital type (n= 18 hospitals)



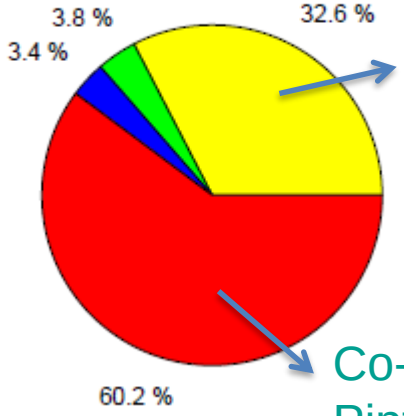
Europe (N= 118 hospitals)



- Tetracyclines
- Penicillins
- Other beta-lactams
- Sulfonamides and Trimethoprim
- Macrolides, Lincosamides and Streptogramins
- Aminoglycosides
- Quinolones
- Other antibacterials

Propotional use of beta−lactam antibacterials (2017)

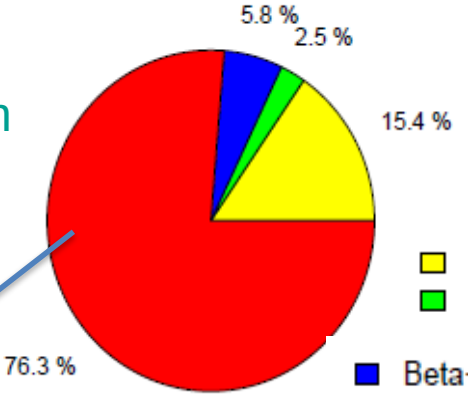
Africa (n= 45 hospitals)



Ampicillin
Amoxicillin

Co-amoxiclav
Piptazo

Europe (N= 115 hospitals)

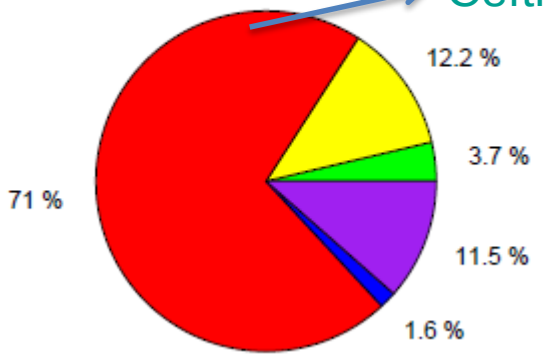


- Penicillins with extended spectrum
- Beta−lactamase sensitive penicillins
- Beta−lactamase resistant penicillins
- Combinations of penicillins, incl. beta−lactamase inhibitors

Propotional use of other beta−lactam antibacterials (2017)

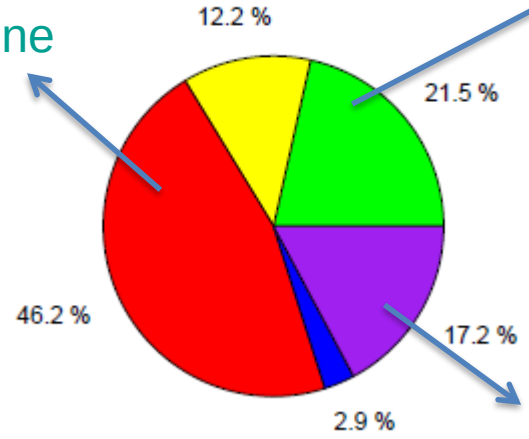
Africa (n= 43 hospitals)

Ceftriaxone



Europe (N= 116 hospitals)

Cefazolin



- First−generation cephalosporins
- Second−generation cephalosporins
- Third−generation cephalosporins
- Fourth−generation cephalosporins
- Carbapenems

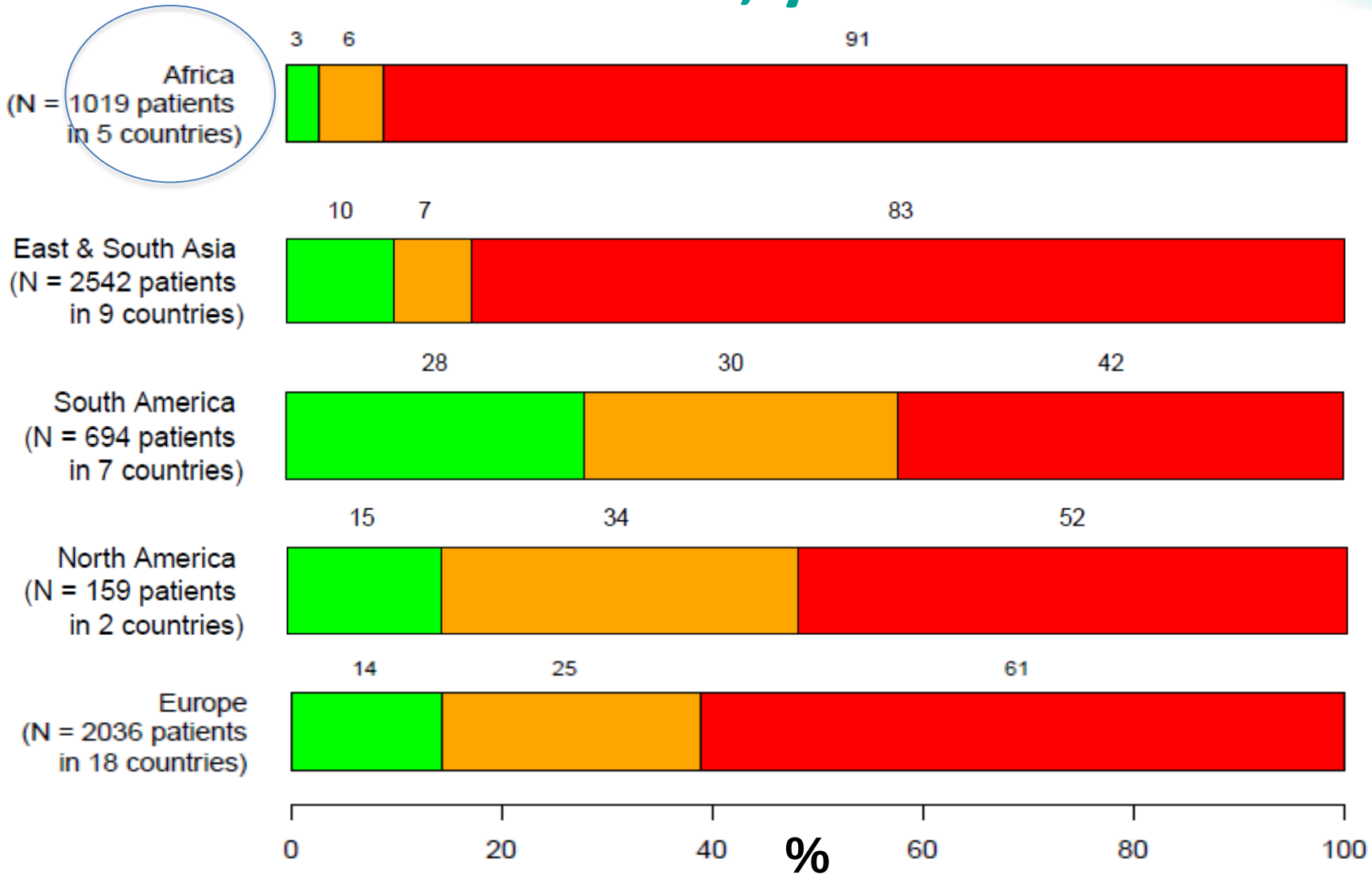
Meropenem

Key prescription patterns for adults and children, 2017

	Africa		Europe	
	N	%	N	%
IV therapy	2617	81.5	8296	77.3
Multiple ABs (J01) patient	1523	47.4	2272	21.2

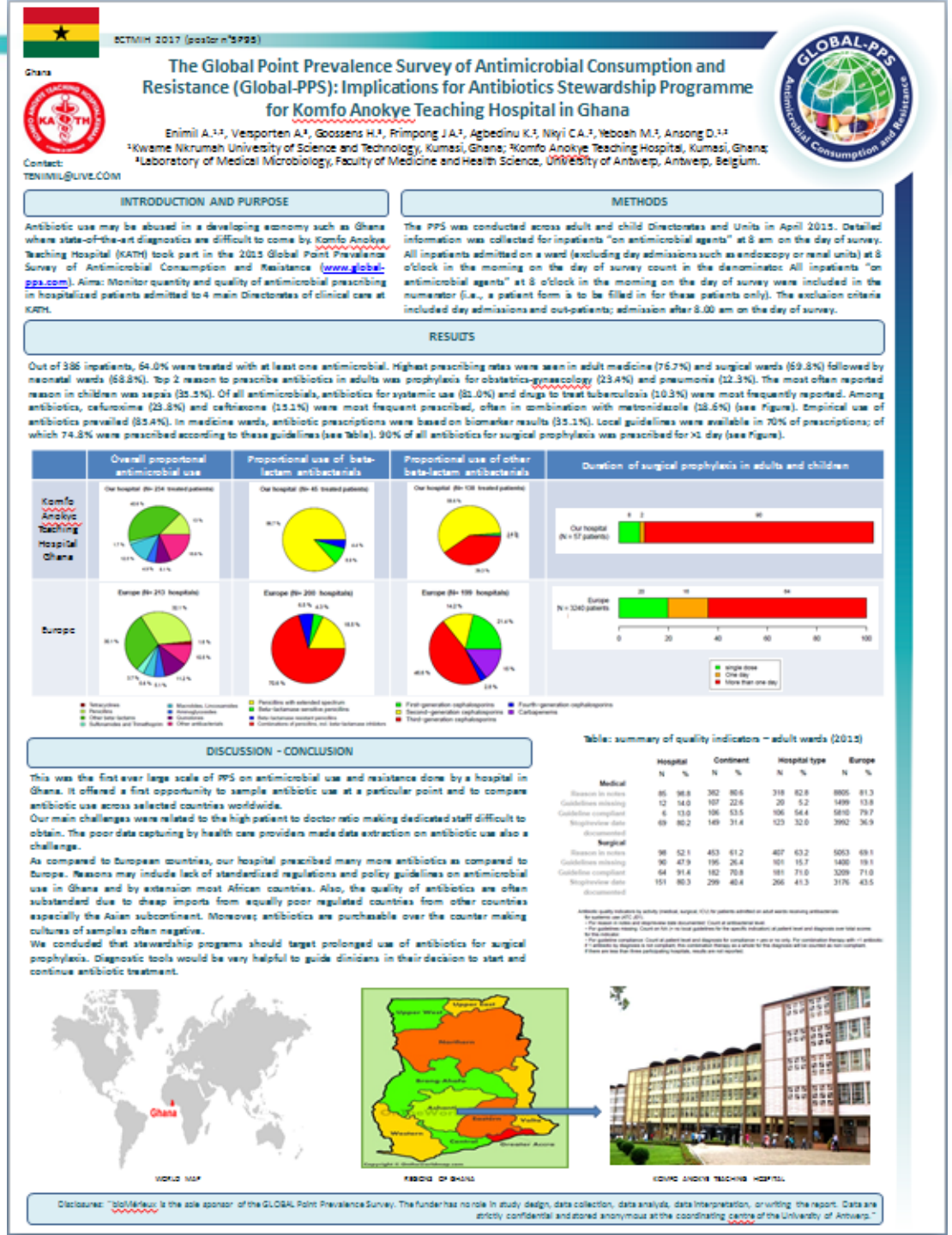
- Higher % of patients on IV therapy in Africa
- Higher % of patients receiving multiple antibacterials

Prolonged surgical prophylaxis is very common in Africa, year 2017



2015 Global-PPS results in one hospital of Ghana presented as poster at the 10th European Congress on Tropical Medicine and International Health

See: www.global-pps.com/dissemination/



ECTMIH 2017 (poster n°SPPS)

Ghana

The Global Point Prevalence Survey of Antimicrobial Consumption and Resistance (Global-PPS): Implications for Antibiotics Stewardship Programme for Komfo Anokye Teaching Hospital in Ghana

Enimil A.[1,2], Versporten A.[3], Goossens H.[3], Frimpong J.A.[2], Agbedinu K.[2], Nkyi C.A.[2], Yeboah M.[2], Ansong D.[1,2]

[1]Kwame Nkrumah University of Science and Technology, Kumasi, Ghana; [2]Komfo Anokye Teaching Hospital, Kumasi, Ghana; [3]Laboratory of Medical Microbiology, Faculty of Medicine and Health Science, University of Antwerp, Antwerp, Belgium.

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INTRODUCTION AND PURPOSE

Antibiotic use may be abused in a developing economy such as Ghana where state-of-the-art diagnostics are difficult to come by. Komfo Anokye Teaching Hospital (KATH) took part in the 2015 Global Point Prevalence Survey of Antimicrobial Consumption and Resistance (www.global-pps.com). Aims: Monitor quantity and quality of antimicrobial prescribing in hospitalized patients admitted to 4 main Directorates of clinical care at KATH.

METHODS

The PPS was conducted across adult and child Directorates and Units in April 2015. Detailed information was collected for inpatients "on antimicrobial agents" at 8 am on the day of survey. All inpatients admitted on a ward (excluding day admissions such as endoscopy or renal units) at 8 o'clock in the morning on the day of survey count in the denominator. All inpatients "on antimicrobial agents" at 8 o'clock in the morning on the day of survey were included in the numerator (i.e., a patient form is to be filled in for these patients only). The exclusion criteria included day admissions and out-patients; admission after 8.00 am on the day of survey.

RESULTS

Out of 386 inpatients, 64.0% were treated with at least one antimicrobial. Highest prescribing rates were seen in adult medicine (76.7%) and surgical wards (69.8%) followed by neonatal wards (58.8%). Top 2 reason to prescribe antibiotics in adults was prophylaxis for obstetrics-gynaecology (23.4%) and pneumonia (12.3%). The most often reported reason in children was sepsis (35.5%). Of all antimicrobials, antibiotics for systemic use (81.0%) and drugs to treat tuberculosis (10.3%) were most frequently reported. Among antibiotics, cefuroxime (23.8%) and ceftriaxone (15.1%) were most frequent prescribed, often in combination with metronidazole (18.6%) (see Figure). Empirical use of antibiotics prevailed (85.4%). In medicine wards, antibiotic prescriptions were based on biomarker results (35.1%). Local guidelines were available in 70% of prescriptions; of which 74.8% were prescribed according to these guidelines (see Table). 90% of all antibiotics for surgical prophylaxis was prescribed for >1 day (see Figure).

DISCUSSION - CONCLUSION

This was the first ever large scale of PPS on antimicrobial use and resistance done by a hospital in Ghana. It offered a first opportunity to sample antibiotic use at a particular point and to compare antibiotic use across selected countries worldwide.

Our main challenges were related to the high patient to doctor ratio making dedicated staff difficult to obtain. The poor data capturing by health care providers made data extraction on antibiotic use also a challenge.

As compared to European countries, our hospital prescribed many more antibiotics as compared to Europe. Reasons may include lack of standardized regulations and policy guidelines on antimicrobial use in Ghana and by extension most African countries. Also, the quality of antibiotics are often substandard due to cheap imports from equally poor regulated countries from other countries especially the Asian subcontinent. Moreover, antibiotics are purchasable over the counter making cultures of samples often negative.

We concluded that stewardship programs should target prolonged use of antibiotics for surgical prophylaxis. Diagnostic tools would be very helpful to guide clinicians in their decision to start and continue antibiotic treatment.

Table: summary of quality indicators – adult wards (2015)

	Hospital		Continent		Hospital type		Europe	
	N	%	N	%	N	%	N	%
Medical								
Reason in notes	85	98.8	382	80.6	318	82.8	8905	81.3
Guidelines missing	12	14.0	107	22.6	20	5.2	1499	13.8
Guideline compliant	6	13.0	106	53.5	106	56.4	5810	79.7
Stop/review date documented	69	80.2	149	31.4	123	32.0	3992	36.9
Surgical								
Reason in notes	98	52.1	453	61.2	407	63.2	5053	69.1
Guidelines missing	90	47.9	195	26.4	101	15.7	1400	19.1
Guideline compliant	64	91.4	182	70.8	181	71.0	3209	71.0
Stop/review date documented	151	80.3	299	40.4	266	41.3	3176	43.5

WORLD MAP — REGIONS OF GHANA — KOMFO ANOKYE TEACHING HOSPITAL

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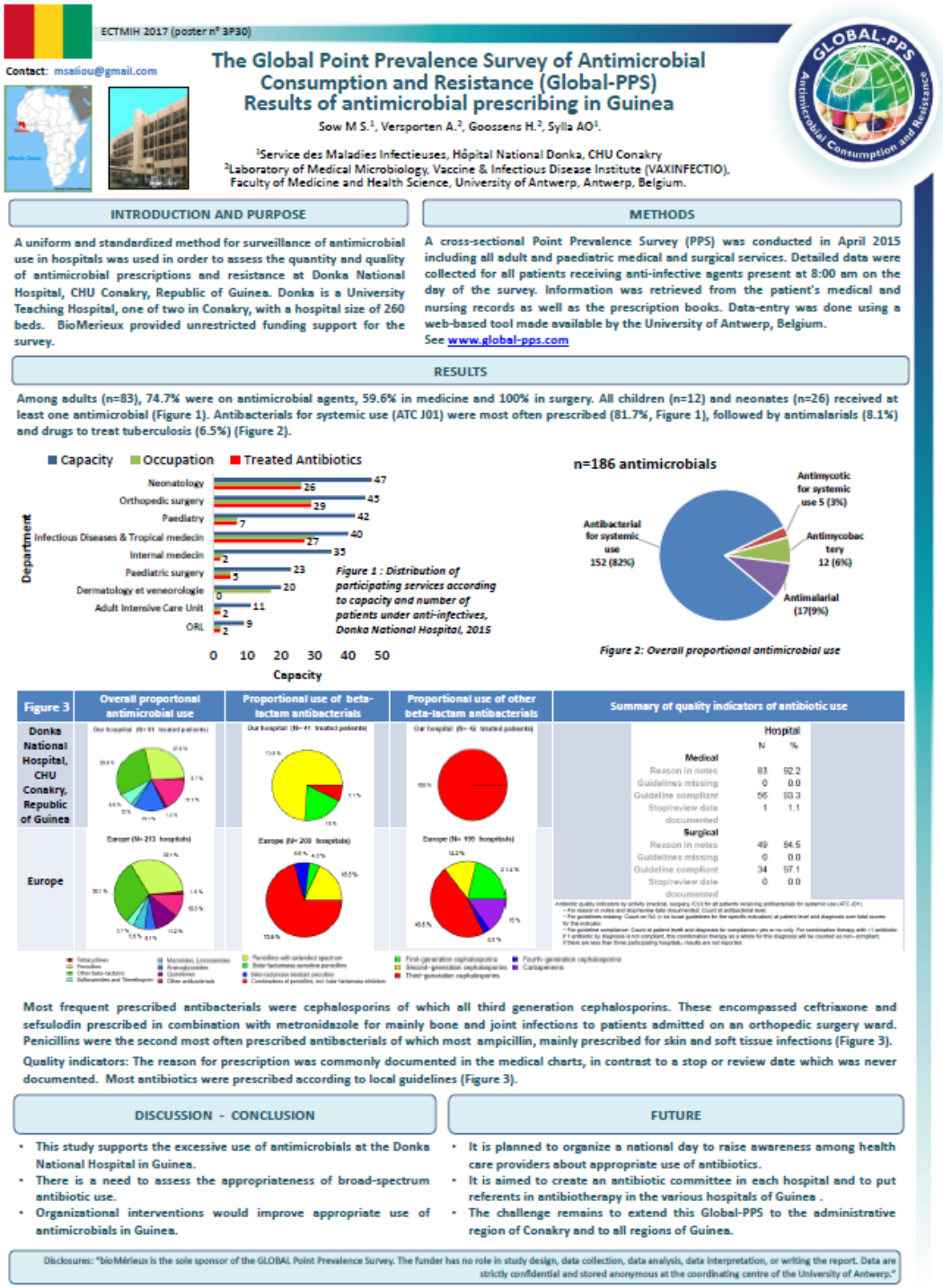
See: www.global-pps.com/dissemination/



ECTMIH 2017 (poster n° 3P30)

Contact: msaliou@gmail.com

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

Sow M S.[1], Versporten A.[2], Goossens H.[2], Sylla AO[1].

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[2]Laboratory of Medical Microbiology, Vaccine & Infectious Disease Institute (VAXINFECTIO), Faculty of Medicine and Health Science, University of Antwerp, Antwerp, Belgium.

INTRODUCTION AND PURPOSE

A uniform and standardized method for surveillance of antimicrobial use in hospitals was used in order to assess the quantity and quality of antimicrobial prescriptions and resistance at Donka National Hospital, CHU Conakry, Republic of Guinea. Donka is a University Teaching Hospital, one of two in Conakry, with a hospital size of 260 beds. BioMerieux provided unrestricted funding support for the survey.

METHODS

A cross-sectional Point Prevalence Survey (PPS) was conducted in April 2015 including all adult and paediatric medical and surgical services. Detailed data were collected for all patients receiving anti-infective agents present at 8:00 am on the day of the survey. Information was retrieved from the patient's medical and nursing records as well as the prescription books. Data-entry was done using a web-based tool made available by the University of Antwerp, Belgium.
See www.global-pps.com

RESULTS

Among adults (n=83), 74.7% were on antimicrobial agents, 59.6% in medicine and 100% in surgery. All children (n=12) and neonates (n=26) received at least one antimicrobial (Figure 1). Antibacterials for systemic use (ATC J01) were most often prescribed (81.7%, Figure 1), followed by antimalarials (8.1%) and drugs to treat tuberculosis (6.5%) (Figure 2).

Figure 1 : Distribution of participating services according to capacity and number of patients under anti-infectives, Donka National Hospital, 2015

Figure 2: Overall proportional antimicrobial use

Most frequent prescribed antibacterials were cephalosporins of which all third generation cephalosporins. These encompassed ceftriaxone and sefsulodin prescribed in combination with metronidazole for mainly bone and joint infections to patients admitted on an orthopedic surgery ward. Penicillins were the second most often prescribed antibacterials of which most ampicillin, mainly prescribed for skin and soft tissue infections (Figure 3).

Quality indicators: The reason for prescription was commonly documented in the medical charts, in contrast to a stop or review date which was never documented. Most antibiotics were prescribed according to local guidelines (Figure 3).

DISCUSSION - CONCLUSION

- This study supports the excessive use of antimicrobials at the Donka National Hospital in Guinea.
- There is a need to assess the appropriateness of broad-spectrum antibiotic use.
- Organizational interventions would improve appropriate use of antimicrobials in Guinea.

FUTURE

- It is planned to organize a national day to raise awareness among health care providers about appropriate use of antibiotics.
- It is aimed to create an antibiotic committee in each hospital and to put referents in antibiotherapy in the various hospitals of Guinea .
- The challenge remains to extend this Global-PPS to the administrative region of Conakry and to all regions of Guinea.

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Example of publication on Global-PPS data

Original Article

A Point Prevalence Survey of Antimicrobial Prescribing in Four Nigerian Tertiary Hospitals

Oduyebo OO, Olayinka AT[1], Iregbu KC[2], Versporten A[3], Goossens H[3], Nwajiobi-Princewill PI[2], Jimoh O[1], Ige TO[1], Aigbe AI[2], Ola-Bello OI, Aboderin AO[4], Ogunsola FT

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Abstract

Introduction: Antimicrobial resistance has become a global challenge in health care. Its emergence in previously sensitive bacteria is usually associated with poor antibiotic-prescribing patterns. **Methodology:** A point prevalence survey was carried out in four tertiary hospitals in Nigeria in 2015 to determine the rate and characteristics of antibiotic prescription. **Results:** Of 828 patients eligible for the study, 69.7% received antibiotics, with highest rates in the adult Intensive Care Unit. There were therapeutic indications in 51.2% of the prescriptions, of which 89.5% were for community-acquired infections. Third-generation cephalosporins were the most prescribed antibiotics. On the evaluation of surgical prophylaxis, only 4.1% were compliant with institutional guidelines and 39.2% gave a reason for prescribing in patient case notes. Less than 1% of the prescriptions were based on the use of biomarkers. **Conclusion:** The prevalence of antibiotic prescription in Nigerian hospitals is high with only about 50% of prescriptions based on clear therapeutic indications. We provide evidence that the country needs to institute a cohesive antimicrobial stewardship intervention program.

Keywords: Antimicrobial stewardship, Nigeria, point prevalence, surveillance

http://www.atpjournal.org/temp/AnnTropPathol8142-2882409_080024.pdf

Key messages

- ✓ **Global-PPS offers a tool, a first step** in the fight against antimicrobial resistance
- ✓ **UNIFORMITY** of data collection - **common simple method >** feasible & achievable surveillance
- ✓ **QUALITY assurance** approach – validation process
- ✓ **Central SUPPORT** towards data collection or other
- ✓ Real-time feedback : **identify areas for quality improvement**
- ✓ **Monitor interventions** – repeated PPS
- ✓ Opportunity to stimulate **local networking**
- ✓ **Communications** to stakeholders, politicians

Key messages

- ✓ Database for **scientific research - Data-sharing**
- ✓ Room for improvements, extra modules
- ✓ Continuous search for **collaborations**
- ✓ **Mutual cooperation and feedback** is highly motivating.

Nigerian testimonial

- ✓ Doctors and nurses and members of our hospital infection control team collected the data on the wards.
- ✓ The online Global-PPS tool to enter data was easy to use.
- ✓ We plan to analyze our data provided in excel and also use the feedback report for presentation at our hospital grand round.
- ✓ We need support for our lab to be able to cover other MDROs in our routine identification and antibiotic susceptibility testing.
- ✓ I will participate again to the 2018 PPS.

You want to know more about it ?

Attend the session on the Global-PPS & AMR in Africa

- Today 10/07, Hall C from 16:30 till 18:30
- Experiences from Egypt, Nigeria, Guinea, South Africa

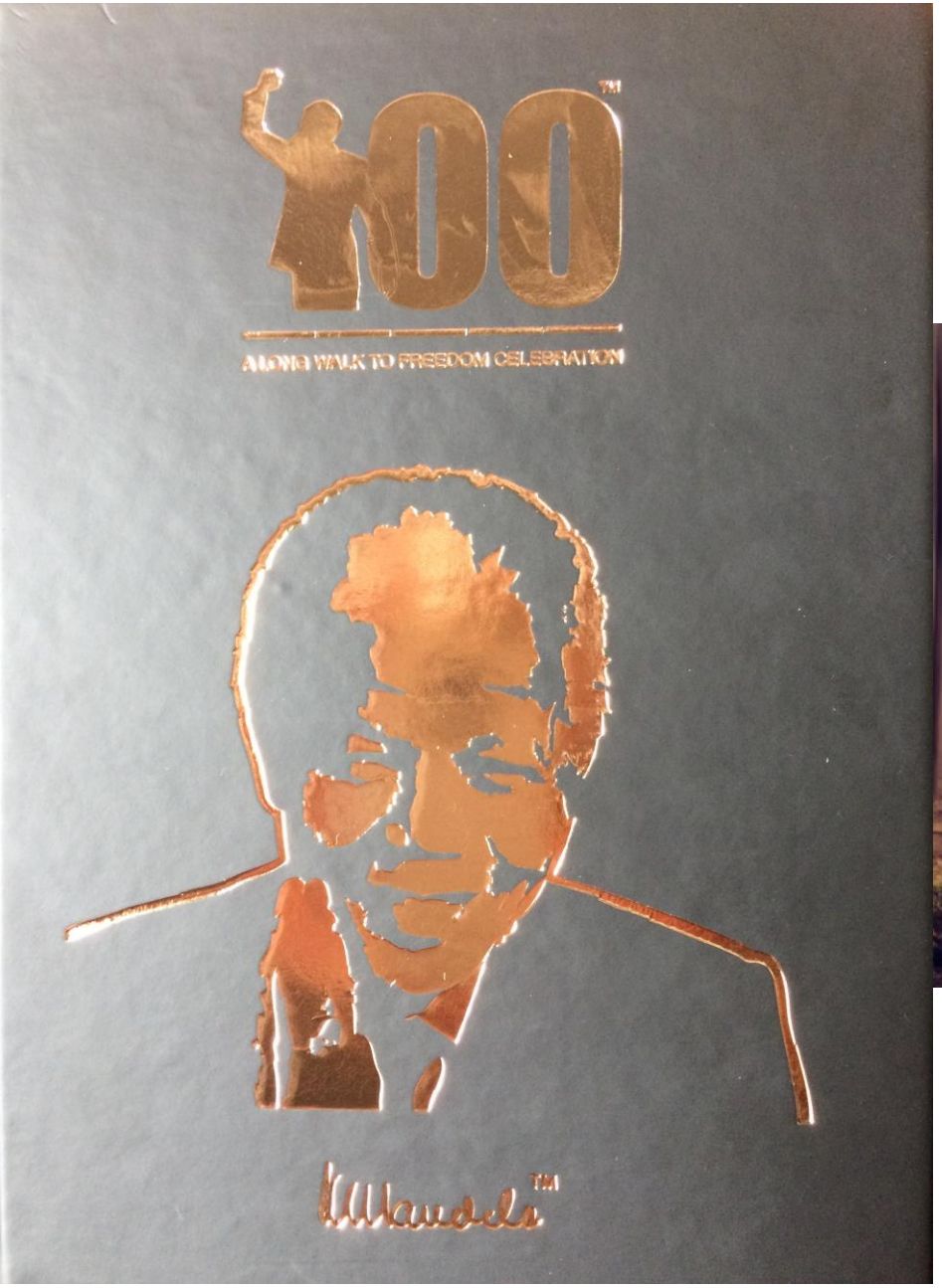
Attend the AMR workshop between ICAN/BSAC Delivering Education and training on AM stewardship: Global and African challenges & solutions

- Thursday 12/07

www.global-pps.com

Any hospital can participate!

Contact global-PPS@uantwerpen.be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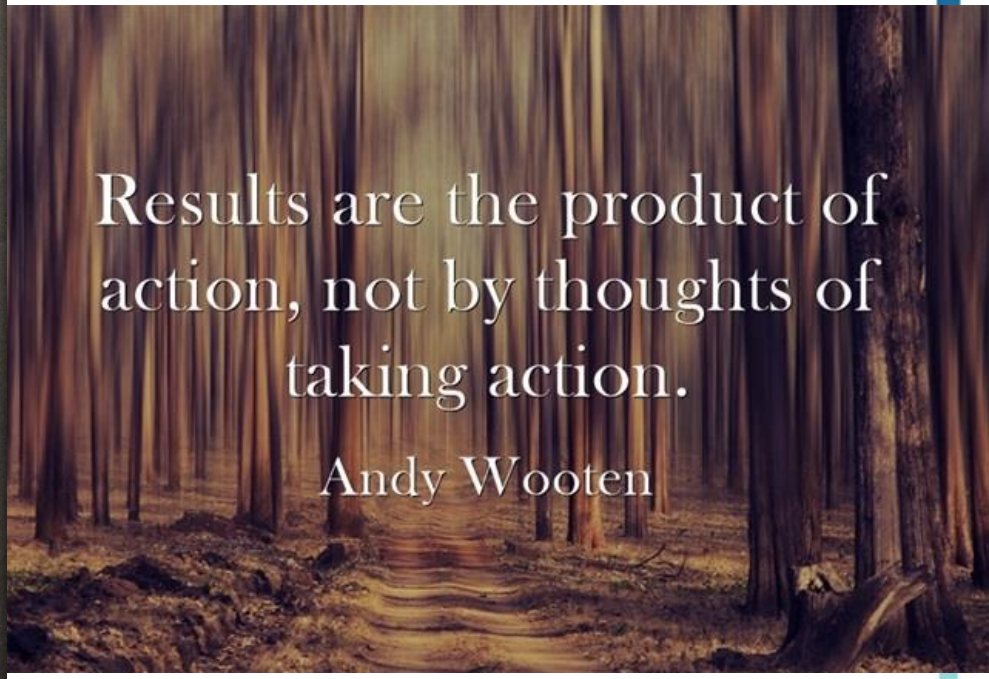
A LONG WALK TO FREEDOM CELEBRATION


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