The prudent use of antimicrobials is a key pillar in the fight against antimicrobial resistance (AMR). Every country in the world must be mobilized to combat this rising pandemic.

One of the first steps for healthcare institutions is to assess the situation in their own setting by measuring antimicrobial use and resistance in order to raise awareness on areas of improvement of local prescribing behaviours.

This document presents the Global Point Prevalence Survey, its facilitating methodology and a selection of recent peer-reviewed publications. These papers demonstrate the impact and value the Global-PPS can bring to healthcare institutions around the world by supporting the effective implementation of Antimicrobial Stewardship interventions to improve appropriate antimicrobial prescribing.

The document also illustrates the growing success of this visionary Global-PPS tool initiated in 2013.

We hope that this document will be a useful, informative resource to encourage new participants to join the growing community of Global-PPS participants (now over 1,000 institutions) and to support healthcare professionals in their pursuit of optimal antimicrobial prescribing practices.

WHAT IS THE GLOBAL-PPS?

- The Global Point Prevalence Survey of Antimicrobial Consumption and Resistance (Global-PPS) provides a standardized method for measuring and monitoring the quality of antimicrobial prescribing practices, the burden of Healthcare-Associated Infections (HAI) and antimicrobial resistance in institutions worldwide.

- The Global-PPS offers a simple, freely available web-based tool for data collection that ensures quality assurance through a validation process. Participants build their own database which is automatically enriched with additional variables to facilitate their own data analysis.

- The Global-PPS provides unique real-time feedback reports including detailed prevalence on the institutions’ own antimicrobial prescribing practices as well as benchmarking figures for the country and region.

- The Global-PPS is adaptable and suitable for different healthcare settings. As such, it has established a global network of institutions conducting point prevalence surveys in more than 90 countries.

- The Global-PPS is instrumental in planning and supporting local and national stewardship interventions in a wide range of resource and geographical settings.

- The Global-PPS is led by the Laboratory of Medical Microbiology at the University of Antwerp, Belgium. The main coordinators are Prof. Herman Goossens, Prof. Erika Vlieghe, Ann Versporten and Ines Pauwels.
Our main objective is to support institutions implementing tailor-made antimicrobial stewardship interventions while sharing knowledge on antimicrobial prescribing and resistance globally.

Ann Versporten, Global-PPS Coordinator, Antwerp University, Belgium

### A GLOBAL NETWORK

- >500,000 patients
- >1,300 institutions
- >90 countries
- >50 publications

### HOW DOES THE GLOBAL-PPS WORK?

- Participating centers conduct a “one-day” cross-sectional PPS by collecting data for hospitalized patients receiving at least one antimicrobial agent at 8:00 am on the day of survey.
- Data are preferably collected on paper forms, and then entered into a database using the Global-PPS web-based application for data entry, validation and reporting.
- The Global-PPS currently offers 3 survey periods a year (January-April, May-August, September-December). Institutions are free to participate in one, two or all three surveys.
- The Global-PPS data collection protocol offers:
  - the basic version of the PPS for surveillance of antimicrobial use, HAI and antimicrobial resistance, as well as surveillance of COVID-19 patients;
  - the full version of the PPS, which includes an optional HAI module for more in-depth surveillance of use of invasive devices and measuring of multimorbidity burden.

### WHAT KIND OF FEEDBACK WILL I GET?

- After data entry and validation, the hospital is able to immediately download automated, real-time feedback reports which can be used for local communications and presentations.
- Institution-specific antimicrobial use can be compared with national and regional benchmark figures.
- Prevalence data on several antimicrobial quality indicators, HAI and resistance are provided.
- The WHO Access, Watch, Reserve (AWaRe) classification is used to visualize antibiotic prescribing patterns.
- Institutions can extract their own data in an Excel file at any time for more in-depth analysis.
WHAT ARE THE FACILITATING FEATURES OF THE GLOBAL-PPS?

- Standardized protocol to collect valid and comparable data on the quality of antimicrobial prescribing and HAI.
- Free, simple, web-based tool requiring minimal training and guaranteeing a quality approach for data entry, validation and feedback reporting.
- Possibility to centralize data entry for a network of institutions.
- Free central support and training from dedicated Global-PPS team.
- Secured data confidentiality. The data remains the property of the institution. The participant adds anonymized data to its own database via repeated Global-PPS.
- Minimal resource investment for maximum impact.

HOW WILL THE GLOBAL-PPS HELP CHANGE PRACTICE IN MY INSTITUTION?

- Identify the burden
  - Evaluate antimicrobial prescribing practices and survey performance indicators in your institution through real-time feedback reports and meaningful comparisons.
- Change antimicrobial prescribing practices
  - Identify targets for quality improvement of antimicrobial prescribing and the prevention of HAI.
  - Design tailor-made AMS interventions informed by Global-PPS results.
- Measure impact and improve
  - Assess the effectiveness of AMS interventions and improve changes in your institution through regularly repeated Global-PPS.
  - Stimulate local multidisciplinary communication, engagement and networking with other Global-PPS participants.

READY TO JOIN US?

It couldn’t be easier!
Enroll at www.global-pps.com or CLICK HERE

WANT TO LEARN MORE?

- Visit the Global-PPS website at https://www.global-pps.com/
- Access >50 Global-PPS publications listed by region/year at https://www.global-pps.com/peer-reviewed-articles/
- Check out the regular Global-PPS Training Webinars at https://www.global-pps.com/events/
  In these interactive webinars, the aims and methodology of the Global-PPS as well as examples of successful AMS interventions are discussed.
- Read the Global-PPS Newsletter at https://www.global-pps.com/newsletters/

TRANSPARENCY DECLARATION

bioMérieux is the sole industrial partner of the Global Point Prevalence Survey. The company has no role in the study design, data collection, data analysis, data interpretation or in writing the report which is the sole and exclusive responsibility of the University of Antwerp.

Data are strictly confidential and stored anonymously at the coordinating center of the University of Antwerp. bioMérieux has no access to the data collected, nor does the University of Antwerp disclose hospital names to any third party, including bioMérieux.
GLOBAL-PPS in a “Doctors without borders” (MSF) Hospital in Bentiu, South Sudan

Dr. Kate Clezy, Infectious Disease Specialist, Antimicrobial Resistance and Infectious Diseases Advisor for MSF Holland

“ Our ultimate goal is to make sure that the doctors working in LMIC are well informed and are able to use antibiotics optimally when treating patients. The results of the Global-PPS can be very helpful when planning improvements in prescribing.

When we conducted the first survey in Bentiu, only a minority of diagnoses were documented in patient records. Thanks to repeated Global-PPS, documentation really improved over the years. This is important because if you improve documentation of diagnostic indicators, then you improve handover to your colleagues.”

GLOBAL-PPS experience within the Philippines Network

Dr. Mari Rose De los Reyes, Infectious Disease Specialist at the Research Institute for Tropical Medicine (RITM) in Manila, the Philippines

“We have been using the Global-PPS protocol since 2017 and over time adapted it to our own local setting. We encode our data in the Global-PPS database, which is based in Antwerp and we find it very useful and sustainable.

Being part of the Global-PPS network, we get individualized hospital results within the Philippines and can compare our national data with other regions. Through the repeated Global-PPS, we can monitor the trend of antimicrobial prescribing and other quality indicators useful for the implementation of our national AMS program. We can use this to develop policies, both for hospitals and on a national level.”

Implementing GLOBAL-PPS in the Democratic Republic of Congo

Dr. Mudji E’Kitiak Junior, Global-PPS Coordinator for the Vanga Evangelical Hospital with staff at the Vanga Evangelical Hospital

“Our 4-point Global-PPS action plan:
- develop a local antibiotic policy and oversee its implementation,
- develop a cleaning program in the hospital,
- retrain staff and patients in hand washing,
- repeat the Global-PPS process.”

For a long time, the overuse and inappropriate use of both antibiotics and antimalarial drugs has been observed. To address this situation, I first had to document the current situation through the collection of antimicrobial use data. I went to the internet and searched for ways to address this problem. Fortunately, I discovered the Global-PPS, a tool that offered exactly what I was looking for and which would help to measure the effectiveness of any future intervention.

Together with my team, we discussed the process of the Global-PPS. We practiced three times before we started the real data collection. Each of the exercises helped us to identify potential problems. We discussed them with the Global-PPS team in Belgium. They responded very quickly and helped us solve all the difficulties we encountered. After data collection, I entered the data on the online application for data entry. I immediately received the final report. It was a good experience for me and my team.”

The Global-PPS is endorsed by multiple Global Health organizations and recognized for its contribution to antimicrobial stewardship and public health. Consult the list at https://www.global-pps.com/supporting-organisations/

As part of the ESAC-PPS project, the University of Antwerp developed an in-house web-based PPS.

At the 4th edition of the World Forum on HAIs and Antimicrobial Resistance, bioMérieux committed to fund the University of Antwerp to develop a worldwide standardized PPS on antimicrobial use and resistance.

The Global-PPS protocol, web-based resource and website were developed.

A pilot Global-PPS was successfully conducted in 33 hospitals worldwide.

First worldwide Global-PPS and establishment of a global network for PPS.

Up to 335 hospitals in 53 countries took part in the first Global-PPS.

First real-time feedback report implemented.

Second worldwide Global-PPS conducted in 391 hospitals in 51 countries.

Global-PPS publishes first paper on difference in quality of prescribing between antibacterials and antifungals.

New option to participate in up to 3 surveys a year.

ECCMID 2018: Presentation of 25 posters.


Four other papers published.

Global-PPS protocol adapted to survey COVID-19 patients.

Real-time feedback report enhanced.

Fourteen new papers published.

Optional HAI module added to collect data on invasive device use and other HAI risk factors.

Global-PPS website updated and translated into 6 languages.

Seven papers published.

Tutorial videos created to guide hospitals in using the Global-PPS tool.

Global-PPS team publishes 2 major papers on Global-PPS results.

Twenty other scientific papers published.

Novel methodology to survey outpatients in development.

>1,300 hospitals in >90 countries participating or enrolled in Global-PPS.
SELECTION OF GLOBAL-PPS PUBLICATIONS

GENERAL GLOBAL-PPS PUBLICATIONS (UNIVERSITY OF ANTWERP / GLOBAL-PPS NETWORK)

Assessing the impact of the Global Point Prevalence Survey of Antimicrobial Consumption and Resistance (Global-PPS) on hospital antimicrobial stewardship programmes: results of a worldwide survey.

Pauwels I, Versporten A, Vermeulen H, Vlieghe E, Goossens H.
ANTIMICROBIAL RESISTANCE AND INFECTION CONTROL 2020;10(1):138

Hospital antibiotic prescribing patterns in adult patients according to the WHO Access, Watch and Reserve classification (AWARE): results from a worldwide point prevalence survey in 69 countries.

Pauwels I, Versporten A, Draper N, Vlieghe E, Goossens H; Global-PPS network.
JOURNAL OF ANTIMICROBIAL CHEMOTHERAPY 2020;75(6):1594-1624

BASELINE STUDIES


ANTIMICROBIAL RESISTANCE AND INFECTION CONTROL 2020;9:33


CANADIAN MEDICAL ASSOCIATION JOURNAL 2019;199(46):E2280-E2289


TROPICAL MEDICINE AND INFECTIOUS DISEASE 2021;7(5):75

Antibiotic Prescribing Patterns in Ghana, Uganda, Zambia and Tanzania Hospitals: Results from the Global Point Prevalence Survey (G-PPS) on Antimicrobial Use and Interventions Implemented.

INFECTION CONTROL & HOSPITAL EPIDEMIOLOGY 2020;41(S1):S523-S523

IMPACT STUDIES

Implementation of a multidisciplinary antimicrobial stewardship programme in a Philippine tertiary care hospital: an evaluation by repeated point prevalence surveys.

de Guzman Betito G, Pauwels I, Versporten A, Goossens H, De Los Reyes MR, Ger MT.
JOURNAL OF GLOBAL ANTIMICROBIAL RESISTANCE 2021;26:167-175

Roll-out of a successful antimicrobial stewardship programme in Lagos University Teaching Hospital Nigeria using the Global-Point Prevalence Survey.

AFRICAN JOURNAL OF CLINICAL AND EXPERIMENTAL MICROBIOLOGY 2021;22(2):240-272

Point Prevalence Surveys and Customized Interventions are Good Strategies to Improve Antimicrobial Use: The Brazilian Experience.

INFECTION CONTROL & HOSPITAL EPIDEMIOLOGY 2020;41(5):522-523

Point prevalence survey of antimicrobial use and resistance: 2015-2018 longitudinal survey results from Nigeria.

AFRICAN JOURNAL OF CLINICAL AND EXPERIMENTAL MICROBIOLOGY 2021;22(2):252-259

Comparing Patterns in Antimicrobial Use During Global Point Prevalence Study at a Single Tertiary Hospital in Ghana: Implications for Antimicrobial Stewardship Programme.

FRONTIERS IN TROPICAL DISEASES 2021;3:443809

Longitudinal Point Prevalence Survey of Antimicrobial Consumption in Russian Hospitals: Results of the Global-PPS Project.

ANTIBIOTICS 2020;9(9):446
Participating institutions must set a time frame to perform the point prevalence survey. Each inpatient ward needs to be surveyed only once, on a single day within this time frame.

Institutions participating for the first time are encouraged to survey the entire institution. Institutions that have previously participated may also survey a subset of wards (e.g., all surgical wards, all pediatric medical wards, ...).

On the survey day, all records for inpatients occupying a bed at 8:00 am are audited and antimicrobial prescriptions are recorded. Admitted patients are counted in the denominator. Patients on antimicrobial agents at 8:00 am on the day of the survey are counted in the numerator.

- For each patient on antimicrobial agents, the following information is recorded: age, sex, weight, biomarker information and whether cultures were sent to the lab.
- For each antimicrobial prescription, information is collected on the antimicrobial agent, administration start day, dose, route of administration, indication for treatment (anatomical site of infection) and indication for therapy (community- or healthcare-associated infection; medical or surgical prophylaxis).

The following quality indicators are recorded for every prescription: reason for antimicrobial prescription and stop/review date recorded in notes, adherence to local guidelines and whether the treatment was empirical or targeted. For targeted prescriptions it is possible to record the pathogens and their respective resistance types.

Data are then entered into a web-based application that helps institutions validate their data using several built-in validation mechanisms.

Global-PPS provides an automated feedback report for each participating institution. These reports show the institution’s Global-PPS results in a set of graphs and tables, along with benchmarking results at the level of the country and the region.
Assessing the impact of the Global Point Prevalence Survey of Antimicrobial Consumption and Resistance (Global-PPS) on hospital antimicrobial stewardship programmes: results of a worldwide survey.

Pauwels I, Versporten A, Vermueen H, Vlieghe E, Goossens H.

OBJECTIVE
This study aimed to (i) evaluate the impact of the Global-PPS on local antimicrobial stewardship (AMS) programs, (ii) pinpoint barriers to AMS implementation in different resource settings, and (iii) identify the learning needs of healthcare professionals involved in AMS who used the Global-PPS to support hospital AMS programs.

STUDY DESIGN
A cross-sectional survey on AMS was sent to members of the Global-PPS network. The survey comprised 24 questions relating to:
- changes to the structure and components of hospital AMS programs following participation in the Global-PPS;
- comprehensiveness and usefulness of the report generated by the Global-PPS automated feedback function and which report items were considered most important in their setting;
- barriers to AMS implementation and specific AMS-linked learning needs of local teams.

Responses were collected from February to May 2019. To analyze data, countries were grouped into the 2019 World Bank income classes and appropriate statistical analysis was performed.

RESULTS
- A total of 248 hospitals participated in the study, of which 192 (77.4%) had participated in at least one Global-PPS (Figure 1). This corresponded to an estimated response rate of 25% (192/765). Of these 192 hospitals, 81.8% had used the personalized Global-PPS feedback report.
- The majority of respondents were tertiary referral centers (65.7%) and teaching hospitals (79.4%). High-income countries accounted for 33.2% of responses; upper middle-income and lower middle-income countries represented 35.1% and 28.2%, respectively; 3.6% of responses came from low-income countries.
- The most common problems identified through this report were high relative use of certain antibiotic classes (62.0%), prolonged surgical prophylaxis (60.3%), and a high antimicrobial use prevalence (60.4%). Importantly, of the 63 hospitals that conducted a follow-up Global-PPS, 54 (85.7%) reported an improvement in one or more of the prescribing-related problems identified earlier (Figure 2).
- Up to 43.1% of responding hospitals reported having a formal antimicrobial stewardship strategy, ranging from 10.8% in Africa to 93.4% in Europe. A further 29.7% of hospitals were planning to develop an AMS strategy. There were less local evidence-based prescribing guidelines in African hospitals than in other regions.
- Of the 179 hospitals that had participated in Global-PPS and had ongoing AMS activities, up to 69.3% reported that at least one of these activities had been initiated as a result of Global-PPS feedback.
- The majority of respondents were tertiary referral centers (65.7%) and teaching hospitals (79.4%). High-income countries based prescribing guidelines in African hospitals than in other regions.
- The most common problems identified through this report were high relative use of certain antibiotic classes (62.0%), prolonged surgical prophylaxis (60.3%), and a high antimicrobial use prevalence (60.4%). Importantly, of the 63 hospitals that conducted a follow-up Global-PPS, 54 (85.7%) reported an improvement in one or more of the prescribing-related problems identified earlier (Figure 2).
- Of the 179 hospitals that had participated in Global-PPS and had ongoing AMS activities, up to 69.3% reported that at least one of these activities had been initiated as a result of Global-PPS feedback.
- The barriers to implementing AMS programs in high- and low- and middle-income countries are shown in Table 2. Three elements were predominant and shared globally: time to work on AMS activities (52.7%), knowledge on good prescribing practices (42.0%), and dedicated funding for the AMS program (39.9%).
- Significant regional differences were also noted. Hospitals in low- and middle-income countries were more often confronted with unavailability of prescribing guidelines (35.6% vs. 75%, p<0.001), insufficient laboratory capacity (35.0% vs. 12.5%, p<0.001), and suboptimal use of available laboratory services (21.5% vs. 2.5%, p<0.001) compared to high-income countries. In high-income countries, a lack of information technology to support antimicrobial prescribing was more frequently identified as a barrier compared to low- and middle-income countries (46.3% vs. 22.1%, p<0.001).

CONCLUSIONS
A substantial variation in hospital AMS programs and barriers to implementation of AMS across regions and income levels globally was revealed. The study showed how participation in the Global-PPS can contribute to hospital AMS activities, both in high- as well as low- and middle-income settings.

“...the results from a survey in 248 hospitals from 74 countries show that the Global-PPS has been very useful in informing and evaluating stewardship activities in many of the participating hospitals.”

KEY FINDINGS
- By providing participating hospitals with a personalized feedback report, the Global-PPS helps local teams to identify AMS targets without investing time and resources in complex data analyses.
- There are substantial regional variations in the percentage of hospitals that have a formal AMS program, and in the degree of implementation of AMS components.
- Organizational factors, e.g., a lack of financial and human resources, continue to constitute important barriers to AMS implementation.
GENERAL GLOBAL-PPS PUBLICATIONS

Table 1: Educational needs of participating hospitals.

<table>
<thead>
<tr>
<th></th>
<th>High-income countries (n = 120)</th>
<th>Low- and middle-income countries (n = 1156)</th>
<th>Total (n = 2332)</th>
<th>P-value ( (\alpha = 0.0036) )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optimising therapeutic antimicrobial use</td>
<td>43 (56.6)</td>
<td>105 (87.3)</td>
<td>148 (63.8)</td>
<td>0.147</td>
</tr>
<tr>
<td>Optimising surgical prophylaxis</td>
<td>38 (50.0)</td>
<td>91 (63.3)</td>
<td>129 (55.6)</td>
<td>0.290</td>
</tr>
<tr>
<td>Translating PPS results into AMS interventions</td>
<td>38 (50.0)</td>
<td>71 (54.5)</td>
<td>109 (47.0)</td>
<td>0.615</td>
</tr>
<tr>
<td>Communicating with prescribers</td>
<td>35 (46.2)</td>
<td>61 (46.3)</td>
<td>66 (46.4)</td>
<td>0.386</td>
</tr>
<tr>
<td>Managing difficult-to-treat MDRO* infections</td>
<td>25 (32.7)</td>
<td>71 (54.5)</td>
<td>96 (44.1)</td>
<td>0.091</td>
</tr>
<tr>
<td>Identifying the low-hanging fruit for AMS in the hospital</td>
<td>38 (50.0)</td>
<td>56 (35.9)</td>
<td>94 (40.5)</td>
<td>0.056</td>
</tr>
<tr>
<td>Translating PPS results into IPC** interventions</td>
<td>27 (22.4)</td>
<td>61 (38.3)</td>
<td>78 (33.6)</td>
<td>0.037</td>
</tr>
<tr>
<td>Formulating/revising guidelines</td>
<td>21 (27.6)</td>
<td>54 (34.6)</td>
<td>75 (32.3)</td>
<td>0.359</td>
</tr>
<tr>
<td>Performing audit and feedback</td>
<td>27 (22.4)</td>
<td>54 (34.6)</td>
<td>71 (30.6)</td>
<td>0.081</td>
</tr>
<tr>
<td>Understanding antimicrobial susceptibility data</td>
<td>15 (19.7)</td>
<td>55 (35.3)</td>
<td>70 (30.2)</td>
<td>0.024</td>
</tr>
<tr>
<td>How to communicate with patients on antimicrobial use</td>
<td>13 (17.1)</td>
<td>41 (28.9)</td>
<td>54 (23.1)</td>
<td>0.009</td>
</tr>
<tr>
<td>Other learning needs</td>
<td>1 (1.3)</td>
<td>2 (1.3)</td>
<td>3 (1.3)</td>
<td>1.000</td>
</tr>
<tr>
<td>No</td>
<td>2 (2.6)</td>
<td>0 (0.0)</td>
<td>2 (0.9)</td>
<td>0.106</td>
</tr>
</tbody>
</table>

*MDRO: multi-drug resistant organisms; **IPC: infection prevention and control

Table 2: Barriers to antimicrobial stewardship implementation.

<table>
<thead>
<tr>
<th></th>
<th>High-income countries (n = 120)</th>
<th>Low- and middle-income countries (n = 1156)</th>
<th>Total (n = 2332)</th>
<th>P-value ( (\alpha = 0.00026) )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of time to perform AMS activities</td>
<td>50 (42.5)</td>
<td>78 (67.9)</td>
<td>128 (52.7)</td>
<td>0.044</td>
</tr>
<tr>
<td>Lack of knowledge on good prescribing practices</td>
<td>28 (23.3)</td>
<td>74 (64.5)</td>
<td>102 (42.0)</td>
<td>0.160</td>
</tr>
<tr>
<td>Lack of funding for AMS programme</td>
<td>41 (33.3)</td>
<td>56 (46.4)</td>
<td>97 (39.9)</td>
<td>0.027</td>
</tr>
<tr>
<td>Lack of cooperation from prescribers</td>
<td>21 (17.5)</td>
<td>67 (56.1)</td>
<td>88 (36.8)</td>
<td>0.034</td>
</tr>
<tr>
<td>Lack of information technology</td>
<td>37 (30.8)</td>
<td>36 (29.1)</td>
<td>73 (31.0)</td>
<td>0.324</td>
</tr>
<tr>
<td>Unavailability of prescribing guidelines</td>
<td>16 (13.3)</td>
<td>58 (32.6)</td>
<td>74 (31.3)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Lack of qualified personnel</td>
<td>13 (10.9)</td>
<td>44 (37.9)</td>
<td>57 (24.3)</td>
<td>0.090</td>
</tr>
<tr>
<td>Lack of support from hospital management</td>
<td>54 (45.5)</td>
<td>40 (24.5)</td>
<td>54 (22.2)</td>
<td>0.282</td>
</tr>
<tr>
<td>Insufficient laboratory capacity</td>
<td>10 (20.0)</td>
<td>57 (16.9)</td>
<td>67 (26.2)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Lack of expertise/training within the AMS team</td>
<td>13 (10.9)</td>
<td>32 (27.6)</td>
<td>45 (19.5)</td>
<td>0.644</td>
</tr>
<tr>
<td>Suboptimal use of laboratory services</td>
<td>3 (2.5)</td>
<td>35 (29.5)</td>
<td>37 (15.2)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Lack of confidence in the hospital’s IPC** processes</td>
<td>13 (10.9)</td>
<td>29 (24.7)</td>
<td>41 (17.2)</td>
<td>0.016</td>
</tr>
<tr>
<td>Lack of trust in prescribing guidelines</td>
<td>7 (5.9)</td>
<td>33 (22.4)</td>
<td>40 (17.1)</td>
<td>0.034</td>
</tr>
<tr>
<td>Regular shortages/stock outs of essential antibiotics</td>
<td>4 (3.3)</td>
<td>24 (17.7)</td>
<td>28 (11.5)</td>
<td>0.044</td>
</tr>
<tr>
<td>Patient demands</td>
<td>7 (5.9)</td>
<td>18 (14.7)</td>
<td>25 (10.3)</td>
<td>0.743</td>
</tr>
<tr>
<td>Poor quality of antibiotics</td>
<td>7 (5.9)</td>
<td>15 (12.2)</td>
<td>22 (9.4)</td>
<td>0.003</td>
</tr>
<tr>
<td>High cost of antibiotics</td>
<td>2 (1.7)</td>
<td>15 (12.2)</td>
<td>17 (7.3)</td>
<td>0.003</td>
</tr>
<tr>
<td>No barriers</td>
<td>2 (1.7)</td>
<td>10 (8.6)</td>
<td>12 (5.2)</td>
<td>0.036</td>
</tr>
</tbody>
</table>

*Statistical significance evaluated using the Pearson’s chi-squared test or Fisher’s exact test. Significance level \( (\alpha) \) has been corrected for multiple testing. **Infection prevention and control values in boldface indicate statistical significance.

GENERAL GLOBAL-PPS PUBLICATIONS

JOURNAL OF ANTIMICROBIAL CHEMOTHERAPY

Hospital antibiotic prescribing patterns in adult patients according to the WHO Access, Watch and Reserve classification (AWaRe): results from a worldwide point prevalence survey in 69 countries.


OBJECTIVE

The aim of this study was to analyze and visualize therapeutic and prophylactic AWaRe antibiotic use patterns in adult inpatients using data collected in the Global-PPS network. Moreover, the study examined for which indication common antibiotics were prescribed globally.

STUDY DESIGN

Data on antimicrobial prescribing in hospitalized patients from the 2015, 2017, and 2018 Global-PPSs were analyzed. Antibiotics were classified as “Access”, “Watch”, “Reserve”, or “Not recommended” using the 2019 WHO AWaRe Classification Database; those not present on the list were recorded as “Unclassified”. The proportion of Access, Watch, and Reserve use was calculated as the number of prescriptions in each category divided by the total number of prescriptions and was stratified according to UN region/subregion/country and World Bank country income classification.

The five most prescribed antibiotics for therapeutic and prophylactic use are reported. To determine the relative use of Access and Watch antibiotics, Access-to-Watch ratios were calculated and expressed in relation to the overall country median. For selected Watch (azithromycin, ciprofloxacin, ceftriaxone, vancomycin, and meropenem) and Reserve antibiotics, the most common indications for prescription are described. Finally, the proportion of Reserve antibiotics prescribed empirically is given.

RESULTS

After excluding data on pediatric antibiotic use, the final dataset included 80,671 inpatients (106,105 prescriptions) treated in adult wards in 664 hospitals in 69 countries. Three hundred fifty-two (53.0%) hospitals were located in high-income, 474 (67.1%) in upper-middle-income, 141 (21.2%) in lower-middle-income, and 27 (4.1%) in low-income countries. Most institutions were tertiary hospitals (267; 40.2%). Pneumonia was the most common reason for antibiotic prescription (19.2%), followed by skin and soft tissue infections (9.8%), and intra-abdominal infections (70%).

Region-wide, West and Central Asian hospitals prescribed the highest percentage of Watch antibiotics (66.3%) and the lowest Access percentage (28.4%) (Figure 1). In Europe, Access percentages varied between 30.2% in Eastern Europe and 55.2% in Northern European hospitals. The overall percentage of Reserve use was 2.0%, ranging from 0.03% in Sub-Saharan Africa to 4.7% in Latin America. The highest percentage of not-recommended antibiotics was seen in Northern Africa (2.3%).

Country-wise, the highest Access percentages were observed in Sub-Saharan countries and the lowest were in Armenia (12.1%), Jordan (12.2%), and China (15.5%). Watch prescribing was high in Armenia (67.9%) and Jordan (84.4%), whereas the lowest percentages were reported by Guinea (32.1%), South Africa (37.7%), and the UK (39.5%). Reserve prescribing was highest in Argentina (32.6%), India (76.8%), and Brazil (73%). For several participating countries (Nigeria, Guinea, Togo, Laos, Kosovo, Kyrgyzstan, and Armenia) no Reserve prescriptions were reported. Most countries had an Access-to-Watch ratio lower than 1, with the median being 0.7 (IQR 0.5–0.9). Only in 5/43 countries, the Access-to-Watch ratio was higher than 1, corresponding to a higher proportion of Access compared to Watch antibiotics prescribed.

The most commonly used antibiotic for therapeutic use on adult wards worldwide was ceftriaxone, ranging from 2.5% of therapeutic prescriptions in Northern Europe to 24.8% in Eastern Europe. For prophylactic use Access antibiotics were more commonly prescribed in almost all regions. The most common indications for selected Watch antibiotics are shown in Table 1. Their use differed between regions. Regarding Reserve antibiotics, linezolid was most commonly prescribed worldwide (29.9% of Reserve prescriptions); closely followed by colistin (27%). Reserve antibiotics were mainly used to treat pneumonia (26.2%), skin and soft tissue infections (32.9%), and intra-abdominal infections (10.5%). Empirical prescribing of Reserve antibiotics ranged from one-third to half of the prescriptions, with up to 53.0% in lower-middle-income countries, which likely indicates a lack of diagnostic capacity.

CONCLUSIONS

An important heterogeneity in AWaRe prescribing at the level of countries, regions, and income was observed. An analysis of the indications of some essential Watch antibiotics was enabled by the availability of prescription-level Global-PPS data.
Although considerable interregional differences were observed, a large proportion of prescriptions for key Watch antibiotics were issued for indications other than those for which they were included in the Essential Medicine List.

This was the first worldwide analysis of hospital AWaRe prescribing in adults.

There are considerable differences in proportional use of Access, Watch, and Reserve antibiotics between regions and countries and between countries with low- versus middle- and high-income level.

Important insights into the indications for the use of Watch antibiotics were gained.


OBJECTIVE
The objective of this study was to present the main results of the second European Centre for Disease Control (ECDC)-PPS and Global-PPS of antimicrobial use and healthcare-acquired infections (HAIs) in acute care hospitals in Belgium.

STUDY DESIGN
Two cross-sectional studies, the ECDC-PPS and the Global-PPS, were simultaneously carried out in Belgian acute care hospitals in 2017.

Systematic sampling design was applied to include a representative sample of hospitals for the ECDC-PPS. All remaining hospitals were invited to participate in the Global-PPS. ECDC-PPS data were imported in the Global-PPS tool to enable combined analysis and reporting of results. For the HAI component, results were reported separately due to different methodology. Several antimicrobial quality indicators were collected using the Global-PPS methodology only.

RESULTS

- A total of 110 acute care hospital sites participated in the Global-PPS and ECDC-PPS survey in 2017. The study included 28,007 patients, of whom 16,207 in the Global-PPS and 11,800 in the ECDC-PPS. More than 93% of patients surveyed were adults. The prevalence of patients on at least one antimicrobial was 27.3% whilst 18.2% patients were treated with multiple antimicrobials.
- In the ECDC-PPS, the prevalence of patients with at least one HAI was 7.3% (95%CI 6.8–7.7%), of which pneumonia (21.6%) and urinary tract infections (21.3%) were the most frequently reported.
- Antimicrobials were prescribed most frequently for community-acquired infections (CAI) (51.7%), whilst 25.3% were prescribed for a healthcare-associated infection (HAI), 2.7% for an infection related to a long-term care facility (LAI), 5.9% for medical and 11.2% for surgical prophylaxis.
- Amongst all antimicrobials, 91.5% were antibacterials for systemic use. Penicillins with beta-lactamase inhibitors and fluoroquinolones were used most commonly for CAIs, HAIs, and LAIs. For medical prophylaxis, combinations of sulphonamides and trimethoprim were most used. First generation cephalosporins (mainly cefazolin) were prescribed most frequently for surgical prophylaxis (Figure 1).
- The top three most frequent diagnoses treated with antibacterials were pneumonia (23.2%), lower and upper urinary tract infections (15.2%) and skin and soft tissue infections (11.2% for surgical prophylaxis).
- The reason for antimicrobial use was recorded for 81.9% and the stop/review date for 40.8% of the prescriptions. For antibiotic prescriptions, compliance with local antibiotic guidelines was 76.6%; for surgical prophylaxis, this compliance was 73.2%.
- The overall prevalence of antimicrobial use and HAI, as well as most results for the antimicrobial quality indicators remained similar to those found in previous surveys. Local targets for improving antimicrobial prescription practices and reducing HAI rates should be set.

CONCLUSIONS
The overall prevalence of antimicrobial use and HAI, as well as most results for the antimicrobial quality indicators remained similar to those found in previous surveys. Local targets for improving antimicrobial prescription practices and reducing HAI rates should be set.

“...the number of patients who develop a HAI in Belgian acute care hospitals remains high. The reasons for these high rates of HAIs should be further investigated.”

KEY FINDINGS
- Overall, the degree of participation was high (81.4%) and comprised 28,007 inpatients. The overall antimicrobial use prevalence was 27.3%.
- High prescribing of fluoroquinolones is a concern and should be a target for intervention.
- Further improvements regarding antimicrobial quality indicator performance are needed to reach the targets established by the Belgian Antibiotic Policy Coordination Committee (90% by 2019 for all indicators).

Figure 1: Percentage of antibiotic prescriptions per antibiotic subclass and indication as determined by the Global-PPS and ECDC-PPS in Belgium 2017. Reproduced from Vandael E, et al. Antimicrob Resist Infect Control. 2020;9(1):13. Creative Commons license - CC BY 4.0.
OBJECTIVE
The main objective was to describe antimicrobial usage based on patient-level data in Canadian hospitals collected as part of the Global-PPS in 2018. Furthermore, the study evaluated antimicrobial use against resistant organisms and practice appropriateness based on quality indicators for the three different regions (West, Central, Atlantic).

STUDY DESIGN
Between June and December 2018, Global-PPSs were performed in 47 Canadian hospitals, ranging from primary care to tertiary and specialized centers. They include 18% of Canadian acute care beds and are situated in 8 of 10 provinces.

RESULTS
- In 47 Canadian hospitals, data on 13,272 inpatients was reviewed, of whom 4,447 (33.5%) received antimicrobials, which varied from 26.4% in the Atlantic to 36.9% in the West region.
- The majority of antimicrobials were prescribed for therapeutic use (74.1%) and accounted for: 74.7% prescriptions in adults, 65.1% in children and 58.2% in neonates. In 39.4% of these cases, the prescribed antimicrobial was targeted, based on a microbiological result.
- A total of 29.6% of antimicrobials were prescribed to treat respiratory tract infections, 11.5% to treat urinary tract infections, and 11.0% to treat intra-abdominal infections.
- Regarding surgical prophylaxis (SP), single dose medication accounted for 37.9% of antibiotic prescriptions, whilst 31.1% was prescribed for more than 1 day.
- ~84% of antimicrobials prescribed were antibiotics: penicillins with β-lactamase inhibitors (19.1%), first-generation cephalosporins (13.4%), third generation cephalosporins (11.1%) and fluoroquinolones (10.7%). Last-line antibiotics were more commonly prescribed to treat healthcare-associated infections (Figure 1).
- Overall, a diagnosis or indication was documented for 87.3% of prescriptions; 62.9% of antimicrobials had a stop or review date; and 72.0% of prescriptions were guided by local guidelines. In the Atlantic region however, local guidelines were not available in 52.8% of antimicrobial prescriptions.
- The most frequent reported multidrug-resistant organism was methicillin-resistant Staphylococcus aureus (MRSA) in 5.6% of patients receiving MRSA treatment.

CONCLUSIONS
The study provided valid and reliable information on antimicrobial prescribing practices in participating Canadian hospitals and revealed that these were similar to those previously published in Canada. Canadian hospitals should be further incentivized to create and adapt local guidelines on the basis of recent antimicrobial resistance data.

“Future areas of consideration could include the use of more detailed diagnostic codes, graded appropriateness and collection of data regarding allergies to antimicrobials.”

KEY FINDINGS
- Differences were observed between regions with respect to the quantity and quality of antimicrobial prescribing with lowest antimicrobial prevalence seen in the Atlantic region and highest in the West region.
- Future Global-PPS should be performed across Canadian hospitals to evaluate the impact of existing antimicrobial stewardship interventions on trends in antimicrobial prescribing.
Antimicrobial prescribing patterns in patients with COVID-19 varied considerably among the six surveyed hospitals in Russia.

CONCLUSIONS

RESULTS

Between June and December 2021, a point prevalence survey was conducted in COVID-19 wards of six multi-field hospitals from different regions of the Russian Federation (Krasnoyarsk, Moscow, Omsk, Saratov, Smolensk and Yalutsk).

STUDY DESIGN

The objective of this study was to assess the patterns of prescribing antimicrobials in patients with COVID-19 and to evaluate the quality indicators related to the prescriptions in a set of multi-field hospitals in Russia.

OBJECTIVE

The study revealed that overall, 53.3% of patients received at least one antimicrobial agent on the day of PPS with 73.3% of antibiotics belonging to the “Watch” group.

On average, about 1/3 of patients received either antivirals or antibiotics, and 14.1% received a combination of both.

Antibiotic prescriptions were predominantly empirical and about 30% of prescriptions were not compliant with hospital guidelines.
OBJECTIVE
The objective of this study was to evaluate the variation in antibiotic use in Brazilian hospitals that joined the Global-PPS project.

STUDY DESIGN
In 2017 PPSs were conducted in 18 hospitals from six states across three regions (Northeast, South and Southeast) of Brazil.

RESULTS
n During the PPS, 1,801 patients were evaluated (1,622 adults and 179 children and neonates) of which 941 (52.2%) were on antimicrobials ranging from 48.6% in the South to 60.4% in the Northeast.

n Intensive care units had the highest prevalence of antimicrobial use, 60.3% in adults and 71.1% in children; 42.5% of inpatients were receiving more than one antimicrobial on the day of the survey.

n Antibacterials for systemic use accounted for 89.9% of all antimicrobial prescriptions of which the top four prescribed were broad-spectrum antibiotics (44.6% of prescriptions). These were: ceftriaxone (22.8%), meropenem (12.3%), vancomycin (10.3%) and piperacillin with a beta-lactamase inhibitor (9.3%) (Figure 1).

n The three most common indications for the use of antibiotic therapy were pneumonia or lower respiratory tract infections (29.2%), intraabdominal sepsis (32.5%) and bone or joint infections (9.5%).

n Of the antimicrobials prescribed for systemic use, 39% were prescribed to treat community-acquired infections (CAI) and 40.5% to treat healthcare-acquired infections (HAI; mainly meropenem and vancomycin) and 18.8% for medical or surgical prophylaxis (SP). Cefazolin was most commonly prescribed for SP (62.4%).

n Empirical use was higher in CAIs than in HAs (86.6% versus 65.9%). Out of 69 targeted therapies for CAI and 182 for HAI, 29% and 83.5%, respectively, were targeting multidrug-resistant organisms (MDRO); mainly Gram-negative bacteria (75% of all MDROs for CAI and 78.2% of HAI).

n Compliance to guidelines was high in all regions (>80%).

CONCLUSIONS
This first large-scale Global-PPS showed that the prevalence of antimicrobial use in Brazil is high with considerable variations observed between regions. It is assumed that these results are partly related to a restrictive law on over-the-counter sales of antimicrobials, with a greater drop in sales observed in the South than in the Northeast.

“Participants should use these data as part of an antimicrobial stewardship programme to set tailor-made targets to improve antibiotic prescribing in their hospitals.”
Antimicrobial Consumption and Resistance in a Tertiary Care Hospital in Jordan: Results of an Internet-Based Global Point Prevalence Survey.


OBJECTIVE
The objective of this study was to assess antimicrobial prescribing and resistance in a teaching hospital in Jordan as part of the Global-PPS network.

STUDY DESIGN
In June–July 2018, a cross-sectional Global Point Prevalence Survey of antimicrobial prescribing practices and the presence of antimicrobial resistance was conducted at the 600 bed “Jordan University Hospital” in the Hashemite Kingdom of Jordan.

RESULTS
- Data included 488 admitted patients. The overall prevalence of antimicrobial use was 45.3% in adults, 30.6% in children, and 22.2% in neonates (of which all in neonatal intensive care unit, 44.4%).
- Amongst admitted patients, 7.4% were treated for at least one healthcare-associated infection (HAI).
- Cephalosporins and carbapenems were the most prescribed antibiotics (50.6% and 39.6%, respectively), followed by a group of other antibacterials accounting for ~22% of prescriptions (glycopeptide, polymyxins, steroid antibacterials, imidazole and nitrofurans derivatives) whereas the penicillins group was third.
- Most therapeutic antimicrobials were prescribed for community-acquired infections (CAI) (69.8%), of which 85.8% were for empiric treatment; whereas the remaining 30.2% were prescribed to treat an HAI, of which 62.3% empirically.
- The overall resistance prevalence based on microbiology data, was 26.0% (33/127 patients treated for a CAI or HAI); with methicillin-resistant Staphylococcus aureus (MRSA) (7.1%) and other multidrug-resistant organisms (8.7%) most often isolated.
- Of the antimicrobial quality indicators reviewed, the availability of the stop/review date documentation was low (8.4% of all prescriptions). Prolonged surgical prophylaxis (SP) was common (60.9% of antibiotic prescriptions for SP; Figure 1).

CONCLUSIONS
This study enabled for the first time to establish baseline data for the hospital on the quantity and quality of antimicrobials prescribed. The adherence to the WHO recommendations on surgical prophylaxis should take priority. The diagnostic tests to reliably support the selection of appropriate antibiotics should be enhanced. Future participation in the Global-PPS should include more training on appropriate antibiotic prescribing and implementation of strict infection prevention and control measures.

“The study should encourage the establishment of tailor-made antimicrobial stewardship interventions and support educational programs to enhance appropriate antibiotic prescribing.”

Figure 1: Duration of surgical prophylaxis in adults and children stratified by type of surgical procedure.

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KEY FINDINGS
- High prevalence of antimicrobial use in adult wards (45.3%).
- High broad-spectrum antibiotic use including carbapenems, third-generation cephalosporins, vancomycin.
- High overall resistance rate among patients treated for a CAI (26.0%) as compared to Europe (2.9-6.4%; 2015 data) and Canada (8.5%; 2017 data).
- High prevalence of MRSA infections (7.1%) is in line with high carriage rates of MRSA among healthy individuals.
- Analysis of antibiotic quality indicators showed poor documentation of reason for prescription and stop/review date.
Point-prevalence surveys of antimicrobial consumption and resistance at a paediatric and an adult tertiary referral hospital in Yangon, Myanmar.

Oo WT, Carr SD, Marchello CS, San MM, Oo AT, Oo MW, Lwin KT, Win HH, Crump JA.

OBJECTIVE
A point prevalence survey was performed to describe antimicrobial consumption in two hospitals and ultimately inform the development and maintenance of evidence-based antimicrobial stewardship programs.

STUDY DESIGN
Global-PPS was conducted in two public tertiary referral hospitals in Yangon, Myanmar: Yangon Children’s Hospital (YCH) and Yangon General Hospital (YGH) in December 2019.

RESULTS
- A total of 1,980 patients were included in the survey: 74.4% at YGH. Prevalence of antimicrobial use was 60.4% at YCH and 64.4% at YGH.
- A total of 2,108 antimicrobials were prescribed overall: 506 (24.0%) at YCH and 1,602 (76.0%) at YGH. Antibacterials for systemic use accounted for 1,808 (85.8%) of all antimicrobial prescriptions. Third generation cephalosporins made up 722 (34.3%) antimicrobial prescriptions.
- A total of 44.6% of antimicrobials were prescribed for community-acquired infection, 6.8% for hospital-acquired infection, 12.5% for medical prophylaxis, and 34.3% for surgical prophylaxis. At YCH, 45.8% were given to patients for community-acquired infections and 32.0% for surgical prophylaxis. At YGH, 44.2% were prescribed for community-acquired infection and 35.3% for surgical prophylaxis.
- Overall, the three most common indications for antimicrobial prescriptions were gastrointestinal tract prophylaxis (15%), skin, soft tissue, bone and joint prophylaxis (14.5%) and treatment of pneumonia (14.4%).
- A reason for antimicrobial prescription and a stop or review date was recorded in the medical notes for 64.5% and 16.6% of antimicrobial prescriptions, respectively. A total of 31.9% of antimicrobial prescriptions were compliant with local guidelines. Up to 53.9% of prescriptions for therapeutic use were based on biomarker data, exclusively C-reactive protein (CRP), and 20.4% of prescriptions were given as targeted therapy. Amongst antimicrobials prescribed for surgical prophylaxis, 5.4% were given as a single dose, 16.6% for ≤1 day, and 78.0% for >1 day.

CONCLUSIONS
The study demonstrated that antimicrobials are commonly prescribed at the two tertiary referral centers in Yangon, Myanmar, where the study was conducted. The results also showed that broad-spectrum antimicrobials were frequently used. The findings underline the need to increase the awareness and support for antibiotic stewardship programs at both hospitals.

“Dissemination of our findings may also encourage other hospitals in Myanmar to implement, or review and update, their own antibiotic stewardship programs.”

KEY FINDINGS
- To the authors’ knowledge, these are the first published PPS results from hospitals in Myanmar.
- Antimicrobials were prescribed to a large proportion (>60%) of patients at each hospital, with antibacterials for systemic use being the most prescribed group (>85%).
- Fewer than 25% of antimicrobial prescriptions had a stop or review date recorded in the patient notes, local antimicrobial treatment guidelines were often not available, and most antimicrobials prescribed for surgical prophylaxis were given for a duration >1 day.
OBJECTIVE

The objective of this study was to evaluate the impact of a hospital-wide antimicrobial stewardship (AMS) program delivered by a multidisciplinary team and informed by five successive PPSs on antimicrobial use and quality of prescribing in a tertiary teaching hospital in the Philippines.

STUDY DESIGN

In September 2017, a baseline PPS was carried out on all wards of the 600-bed hospital, admitting patients of all age groups. Afterwards, a first set of AMS activities was implemented. This was followed by a second PPS in February 2018. Both PPSs informed a second set of AMS activities implemented in mid-2018. The AMS program combined restrictive, persuasive, and structural strategies. Repeated PPSs were performed in September 2018, March 2019, and October 2019. Quality indicators for therapeutic antibiotic prescriptions and for surgical antibiotic prophylaxis (SAP) were analyzed. Antibiotic prescriptions were also categorized according to the WHO AWaRe classification.

RESULTS

- Over five rounds of PPSs, a total of 2,135 hospitalized patients were analyzed over a period of 2 years; 49.5% (1,057) patients were on antimicrobial therapy on the day of PPS. A total of 1,495 prescriptions were reviewed, the majority of which (85.1%) were for systemic antibiotics, of which 74.9% were given for therapeutic use. SAP accounted for 17.3% of all antibiotic prescriptions.
- Pneumonia was the most common reason for antibiotic prescribing (45.9%), followed by skin and soft tissue infections (10.0%) and lower urinary tract infections (8.4%).
- A significant decrease in overall antimicrobial use prevalence and prophylactic prescriptions for >24 hours in surgery patients was observed (both \( p < 0.001 \)) over the study period (Figure 1). There was also a significant increase \( p < 0.001 \) for several quality indicators (documentation of reason for prescribing, and stop or review date).
- Use of “Access” antibiotics of the AWaRe classification remained around 25% of all systemic antibiotics prescribed for therapeutic use. Correlatively, a high use of antibiotics of the “Watch” group was noted (≈74%) and mainly represented by piperacillin/tazobactam and cefuroxime. The use of “Reserve” antibiotics was low (1.6% of therapeutic prescriptions).

CONCLUSIONS

Antibiotic prescribing practices were positively influenced by the implementation of a multidisciplinary AMS program. Further research will assess the long-term trends in antibiotic prescribing, establish if AMS activities led to a sustained change in prescribing behavior, and evaluate the impact on clinical outcomes and antimicrobial resistance rates.

“... repeated PPS are a valuable method to identify targets for quality improvement of antibiotic prescribing and to monitor these indicators, once they have been embedded in the hospital’s AMS strategy.”
Roll-out of a successful antimicrobial stewardship programme in Lagos University Teaching Hospital Nigeria using the Global-Point Prevalence Survey.


The Global-PPS can be used as an inexpensive and convenient monitoring system for antimicrobial use. The introduction of AMS based on education and dissemination of Global-PPS results led to a significant reduction in antimicrobial use prevalence and related quality indicators between 2015 and 2018.

OBJECTIVE
The objective of this study was to describe the roll-out of an antimicrobial stewardship (AMS) program consisting of education, training and an antibiotic policy, and to measure its impact using the Global-PPS at the Lagos University Teaching Hospital, a tertiary care hospital in Nigeria.

STUDY DESIGN
A baseline Global-PPS was conducted in 2015 to inform AMS interventions aimed at promoting rational use of antimicrobials. AMS interventions included education of prescribers, dissemination of PPS results, and formulation of a hospital-wide antibiotic policy. Global-PPSs were repeated in 2017 and 2018 to monitor antimicrobial use prevalence and quality indicators and to measure the impact of the AMS interventions. Antimicrobials were classified according to the WHO AWaRe classification list.

RESULTS
- A total of 746 eligible inpatients were surveyed in the three time periods (2015, 2017, and 2018): 573 admitted to adult wards and 173 to pediatric/neonatal wards.
- Antimicrobial use prevalence decreased significantly (p<0.00001) over time (82.5% in 2015, 65.5% in 2017, and 51.1% in 2018) both in adult and pediatric/neonatal wards (Figure 1).
- The three most prescribed antibiotic groups were third-generation cephalosporins, imidazole derivatives, and quinolones.
- Antibacterials for systemic use accounted for most of the antimicrobial prescriptions.
- There was a significant improvement (p<0.0001) in the documentation of the reason for antimicrobial prescription (from 53.4% in 2015 to 78.7% in 2018) and stop-review date (from 28.7% in 2015 to 70.2% in 2018).
- The overall ACCESS/Watch” ratio increased from 0.62 in 2015 and 0.72 in 2017 to 0.77 in 2018, and no “Reserve” list antibiotics were prescribed during the study.

CONCLUSIONS
The study showed that AMS interventions had a clear impact on antimicrobial prescribing patterns in the hospital in Lagos. The study confirmed the usefulness of Global-PPS to set quality improvement targets and for the monitoring and evaluation of AMS programs in a limited-resource setting.

“We successfully rolled out AMS interventions and evaluated their effectiveness on antimicrobial prescribing patterns and quality indicators using the Global-PPS.”
As a main outcome, the study assessed antimicrobial use in the hospitals, overall and in intensive care units (ICUs).

RESULTS

The Global-PPS was conducted in 2015, 2017 and 2018. Results of the 3 data collection periods were compared.

CONCLUSIONS

The study showed that feedback on prescription practices might have had an impact on local policies of antimicrobial use. This was demonstrated by the overall and ICU-specific decrease in antimicrobial use prevalence in the second PPS.

Although antimicrobial stewardship is recommended by the Brazilian government, data regarding prescription practices in the country are scarce.
OBJECTIVE
The objective of this study was to assess the trends in antimicrobial usage and quality indicators in antimicrobial prescriptions at the tertiary health care facility Komfo Anokye Teaching Hospital (KATH), located in the Ashanti Region of Ghana.

STUDY DESIGN
The results of two Global-PPSs conducted in September 2015 and September 2019 were compared, including all admitted adults, children and neonates.

RESULTS
Data on 386 and 630 inpatients were obtained in 2015 and 2019, respectively. The proportion of patients on at least one antimicrobial was 64% (247/386) and 58.4% (368/630) in 2015 and 2019, respectively. The neonatal medical unit had the highest antimicrobial use (68.4%).

The most common indication for antimicrobial prescriptions was pneumonia which accounted for 16.9% of prescriptions in 2015 and 23.0% in 2019, followed by skin and soft tissue infections (~15% in both surveys) and, in third position, obstetric/gynecological infections (10.7%) in 2015 and tuberculosis (8.9%) in 2019 (Table 1).

During 2015 and 2019 PPSs, 81.0% and 88.1% of prescriptions were for antibacterials for systemic use, most frequently, from the category of other beta-lactams, i.e., cefuroxime and ceftriaxone.

Amongst the antibiotics prescribed, “Access”/“Watch” ratio remained the same in the two surveys (47% “Access” versus 53% “Watch” antibiotics).

There was a decrease in hospital-acquired infections from 6.2% to 4.8% due to the action of a robust infection prevention and control committee.

The use of biomarkers increased from 4.9% to 7.6%.

CONCLUSIONS
The trends in antimicrobial usage in the KATH over the four years (2015-2019) remained high. Even though no AMS interventions were introduced, following the 2015 survey, most of the quality indicators slightly improved. The imminent introduction of the antimicrobial stewardship (AMS) program will improve antimicrobial usage practice and clinical outcomes.

“We hope to further increase the diagnostic capacity in the future and also move towards the possibility of antimicrobial susceptibility testing.”
OBJECTIVE
The study aimed to evaluate antimicrobial prescribing patterns and assess progress in quality indicators in Russian hospitals using three repetitive PPSs over a 4-year period.

STUDY DESIGN
Three PPSs were carried out from February-April 2015, September-November 2017, and September-November 2018 in multidisciplinary hospitals in various regions of the Russian Federation using the Global-PPS methodology.

RESULTS
Fifteen hospitals totalizing 13,595 patients participated in the PPSs. Four hospitals took part twice and one took part in all three surveys. In the initial survey, 63.9% of patients were adults, compared with ~95% in the other two surveys.

The average antimicrobial use prevalence on the day of the PPS was 26.1% and varied <5% in different years and age groups. This indicator was the lowest in medical wards (<20%). In surgical wards, antimicrobial use prevalence reached 23.9%–38.1%, and was the highest (56.6%–100%) in intensive care units.

Most antimicrobials were prescribed to treat pneumonia/lower respiratory tract infections. Most systemic antibacterials prescribed were β-lactams (73.2%, 65.4%, and 55.1%, for the 3 surveys respectively), followed by quinolones (10.2%, 15.8%, and 16.5%) and “other antibacterials” (25%, 9.9%, and 8.7%), mainly metronidazole, vancomycin, and nitrofurans.

For the majority of prescriptions, the selection of the antimicrobial complied with the hospital antibiotic guidelines (74.8%, 66.8%, and 74.3%). The rate of surgical prophylaxis >24h decreased over time, although it remained very high (92%, 84%, and 81% of cases), while single-dose prophylaxis increased (Figure 1).

In the group of four hospitals that repeated the Global-PPS, a positive dynamic of the quality indicators (up to 15%) was observed, and compliance with hospital antibiotic guidelines improved. In two of them, an increase was observed in the documentation of the reason for therapeutic prescription and the stop/review date. In three of them, biomarker data were used more often to support antimicrobial prescribing decisions.

CONCLUSIONS
The results of the Russian Global-PPS study in 2015, 2017, and 2018 revealed the most common anomalies in antimicrobial use in inpatients. These results can be used to develop appropriate antimicrobial stewardship programs adapted to local practices in each participating hospital.

“Increasing the frequency of targeted therapy, compliance with the local antibiotic guidelines, documenting the rationale for antimicrobial administration, and the timing of its discontinuation or drug change remain key priorities that should be considered in antimicrobial stewardship programs for Russian hospitals.”
GLOBAL POINT PREVALENCE SURVEY
OF ANTIMICROBIAL CONSUMPTION
AND RESISTANCE (GLOBAL-PPS)

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