

Pattern of Antimicrobial Use and Resistance at King Fahad Medical City, Insights from Global Point Prevalence Survey of Antimicrobial Consumption and Resistance

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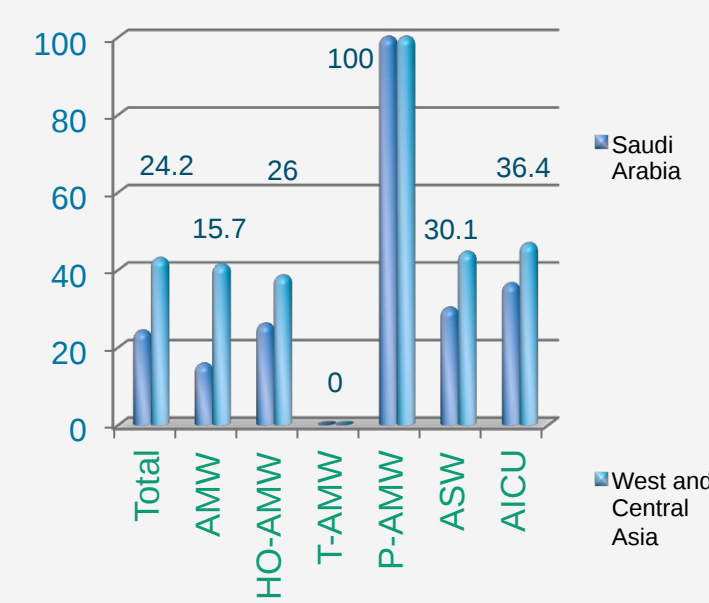
INTRODUCTION

A global point prevalent survey (PPS) of antibiotic use in hospitals (and the community) aims to better control antibiotic resistance through stewardship interventions in a range of resource and geographical settings. Participation to Global-PPS is according to UN macro-geographical regions, Saudi Arabia is considered among West and Central Asia continent. BioMérieux provided unrestricted funding support for the survey. A uniform and standardized method for surveillance of antimicrobial use in hospitals was used to assess the variation in antimicrobial prescribing in King Fahad Medical City (KFMC), a tertiary care 1200-bed hospital in Riyadh, Saudi Arabia. Our main objectives are to identify targets for quality improvement (e.g. duration of peri-operative prophylaxis; compliance with local hospital guidelines; documentation of indication for prescription of antibiotic therapy); help in designing hospital interventions that aim at promoting prudent use of antimicrobials; and allow to assess the effectiveness of such interventions, through repeat PPS.

METHODS

Global PPS was conducted in 2015 and included 335 institutions from 53 countries of 6 continents worldwide. Among 22 hospitals in 8 countries within West and Central Asia continent, KFMC performed PPS as part of Global-PPS in May 2015; the survey included all inpatients 2015. The survey included all inpatients (adults and children) receiving an antimicrobial on the day of PPS. Data collected included age, gender, weight, antimicrobial agents, doses, reasons and indications for treatment, microbiological data, and compliance to guidelines, documentation of reasons and stop/review date of prescription. Denominators included the total number of inpatients. A web-based application is used for data-entry, validation and reporting as designed by the University of Antwerp (<http://www.globxal-pps.com>).

Figure 1



AMW Adult Medical Ward
HO-AMW Hematology-Oncology AMW
T-AMW Transplant (BMT/solid) AMW
P-AMW Pneumology AMW
ASW Adult Surgical Ward
AICU Adult Intensive Care Unit

Figure 2

KFMC Adult patients, N=238

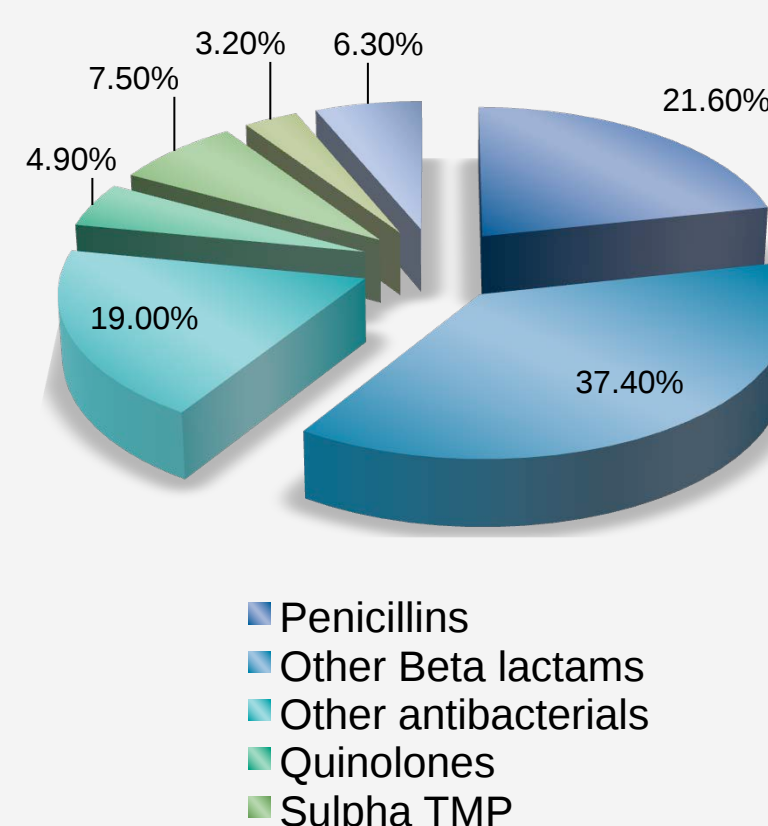


Figure 3

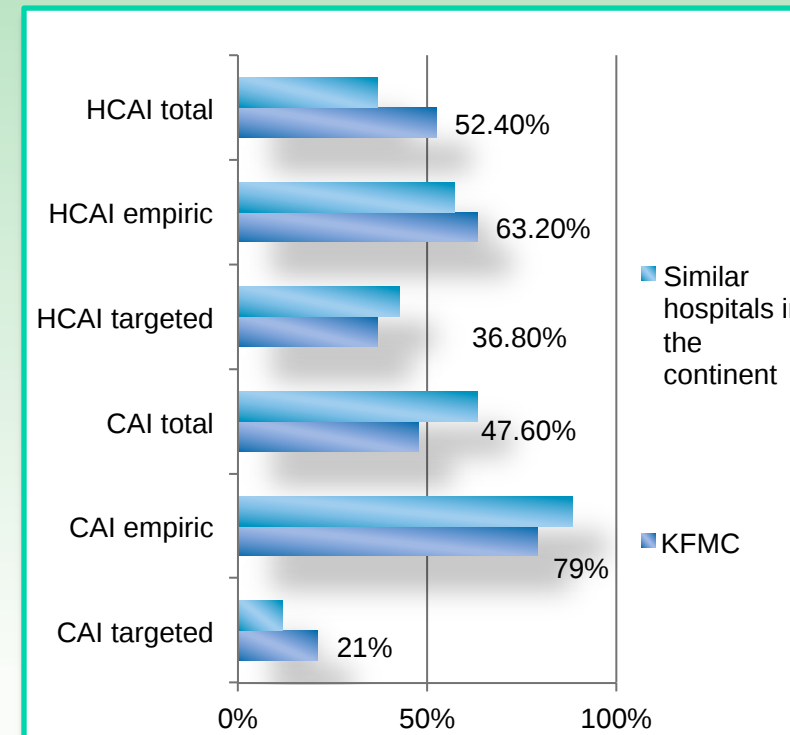
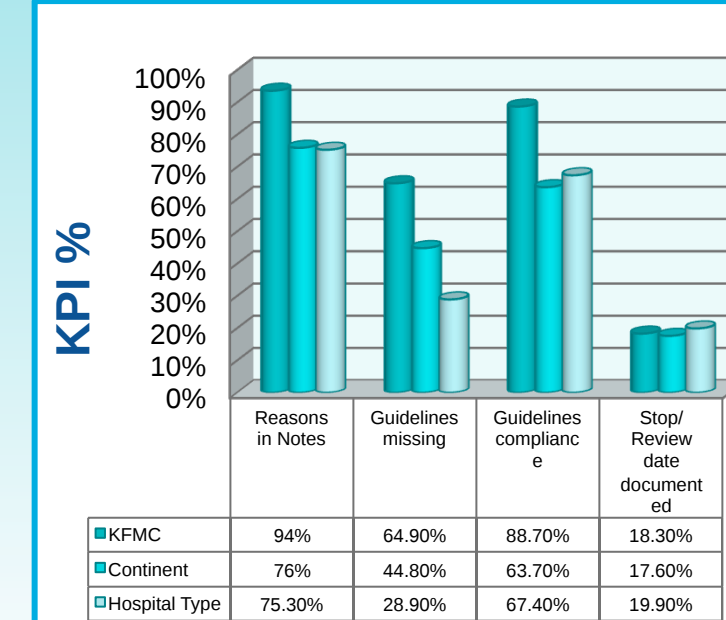
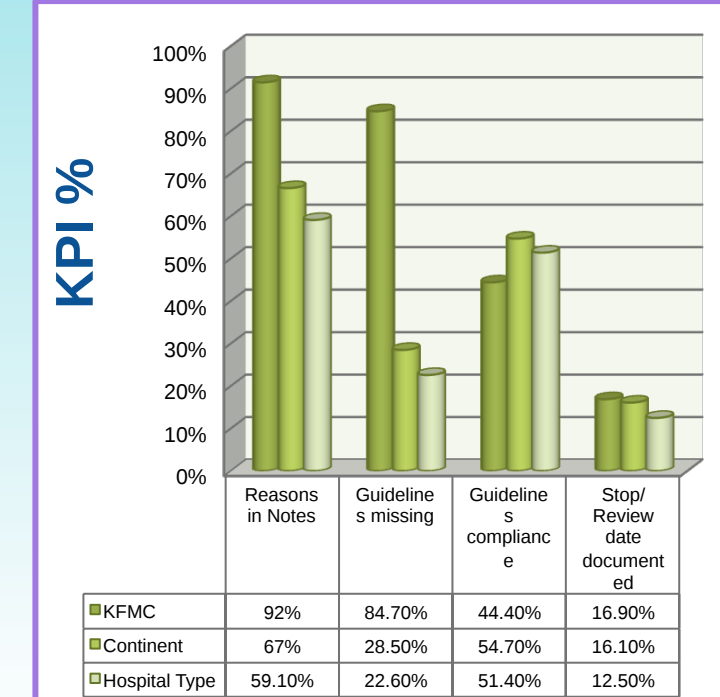


Figure 5a



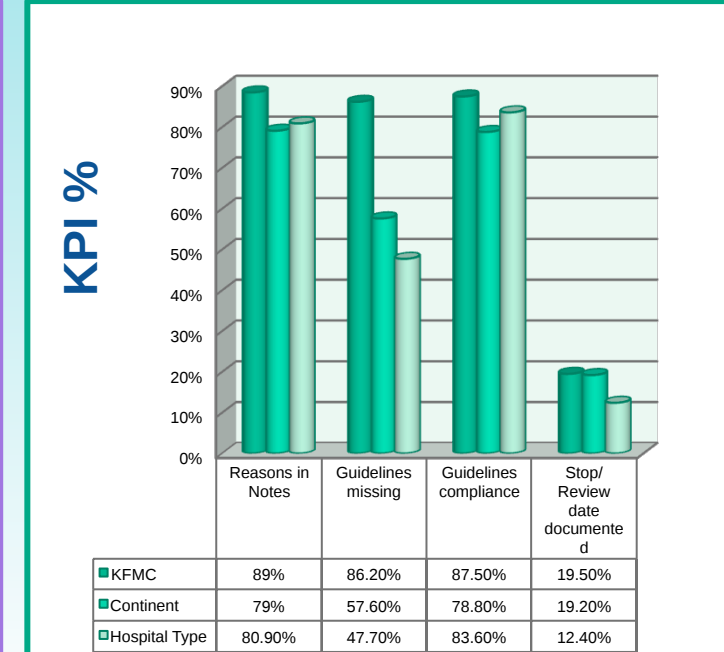
Antimicrobial Quality Indicators (% KPI) - KFMC Adult Medical wards* compared to continent and hospital types,
*Adult Medical: medical, hemonc, transplant and pulmonary wards.

Figure 5b



Antimicrobial Quality Indicators (% KPI) KFMC Adult Surgical wards compared to continent and hospital types,

Figure 5c



Antimicrobial Quality Indicators (% KPI) KFMC Adult ICUs wards compared to continent and hospital types.

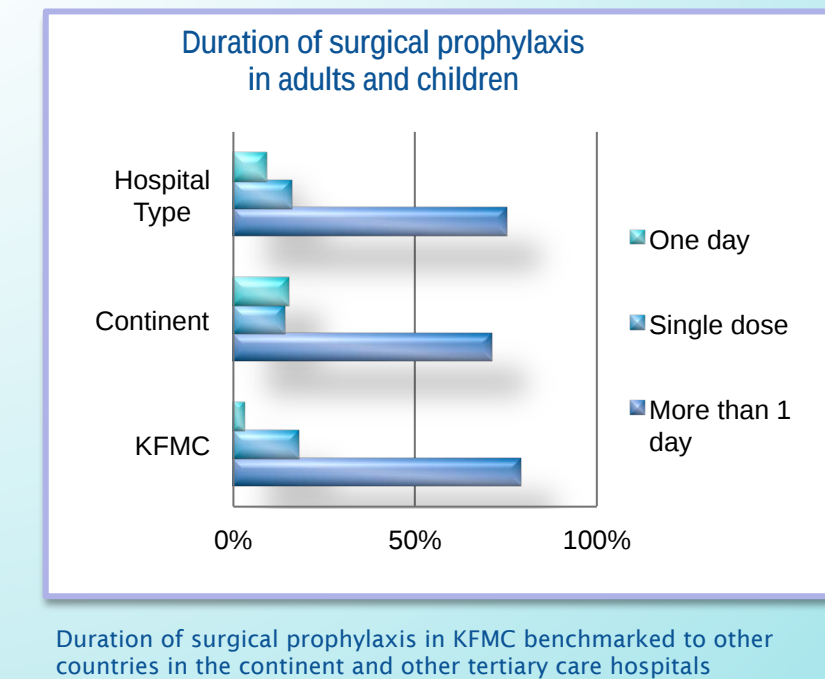
Figure 6 Treatment Based on Microbiology

	KFMC		Continent		Hospital type	
	N	%	N	%	N	%
MRSA	6	3.4	32	2.1	23	3.0
MRCoNS	4	2.2	7	0.5	6	0.8
VRE	0	0	2	0.1	2	0.3
ESBL-prod.Ent.	9	5	49	3.2	28	3.6
3-ceph-R Ent. ESBL no/UN	1	0.6	12	0.8	8	1.0
Carb-R Ent.	0	0	8	0.5	8	1.0
ESBL prod. NF Gram - neg bac.	5	2.8	18	1.2	16	2.1
Carb-R NF Gram - neg bac	8	4.5	22	1.5	18	2.3
Treat other MDR	2	1.1	36	2.4	21	2.7
Any of the above	34	19	163	10.8	110	14.1

RESULTS

- Total of 619 patients admitted, and a total of 46 wards were surveyed in KFMC.
- Overall antimicrobial prevalence was 24.2% as compared to regional prevalence of 42.9% per type of adult ward, **Figure 1**.
- Top 3 reported indications for antimicrobial use are pneumonia (25.3%), sepsis (14.7), and febrile neutropenia (12.6)
- Frequently prescribed antibiotics were other Beta lactams, Penicillins, and other antibacterial agents, **Figure 2**.
- The majority of therapeutic antibiotics were started on empiric bases in both community acquired (79%) and health care associated infection (63.2%), **Figure 3**.
- Duration of surgical prophylaxis in KFMC continued beyond 24 hours in 79% of surgical patients while only 3% received single dose prophylaxis & in 18% prophylaxis continued for 24 hours, **Figure 4**.
- Antimicrobial quality indicators (% KPI) in adult medical, surgical, and ICU wards compared to continent and hospital types are shown in **Figures 5a, 5b, & 5c**. Of note antibiotic guidelines were missing in high proportion of medical, surgical & ICU units while stop and/ or review date was documented in less than 20% across adult wards.
- Figure 6** shows epidemiology of antimicrobial resistant pathogens isolated during the study period across KFMC.

Figure 4



Duration of surgical prophylaxis in KFMC benchmarked to other countries in the continent and other tertiary care hospitals

CONCLUSION

This PPS method offered a standardized tool to assess quantity and quality of antibiotic prescribing in hospital anti-microbial stewardship programs. Our identified gaps were obvious in lack of sufficient guidelines, review or stop date of prescribed antibiotics, and prolonged duration for surgical prophylaxis. These data can serve to identify targets for quality improvement of antibiotic prescribing and optimize existing stewardship program.

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