

Study of Quality Indicators in Surgical Prophylaxis among 5 Asian countries through Global PPS.

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Introduction & Background

- Measuring health care quality is a complex task because outcomes are associated not only to clinical practice but also to population characteristics
- Approximately >400 million surgeries are performed worldwide, with a complication prevalence of 3% to 16%. Surgical site infections (SSI) have been the most frequent among these complications.
- Postoperative mortality generally varies between 0.4% and 0.8% but can reach alarming levels, around 10% in developing countries
- Surgical antibiotic prophylaxis is an important tool for reducing wound infection risks. Despite many published guidelines for the best prophylaxis practice, adherence to these recommendations is low specially in developing countries. (1)
- Quality processes are important tool for understanding antimicrobial utilization. (2) In this study we looked into the variations of compliance for quality process measures in surgical prophylaxis across five countries in south and south-east Asia as part of the Global-PPS.

Aims & Objectives:

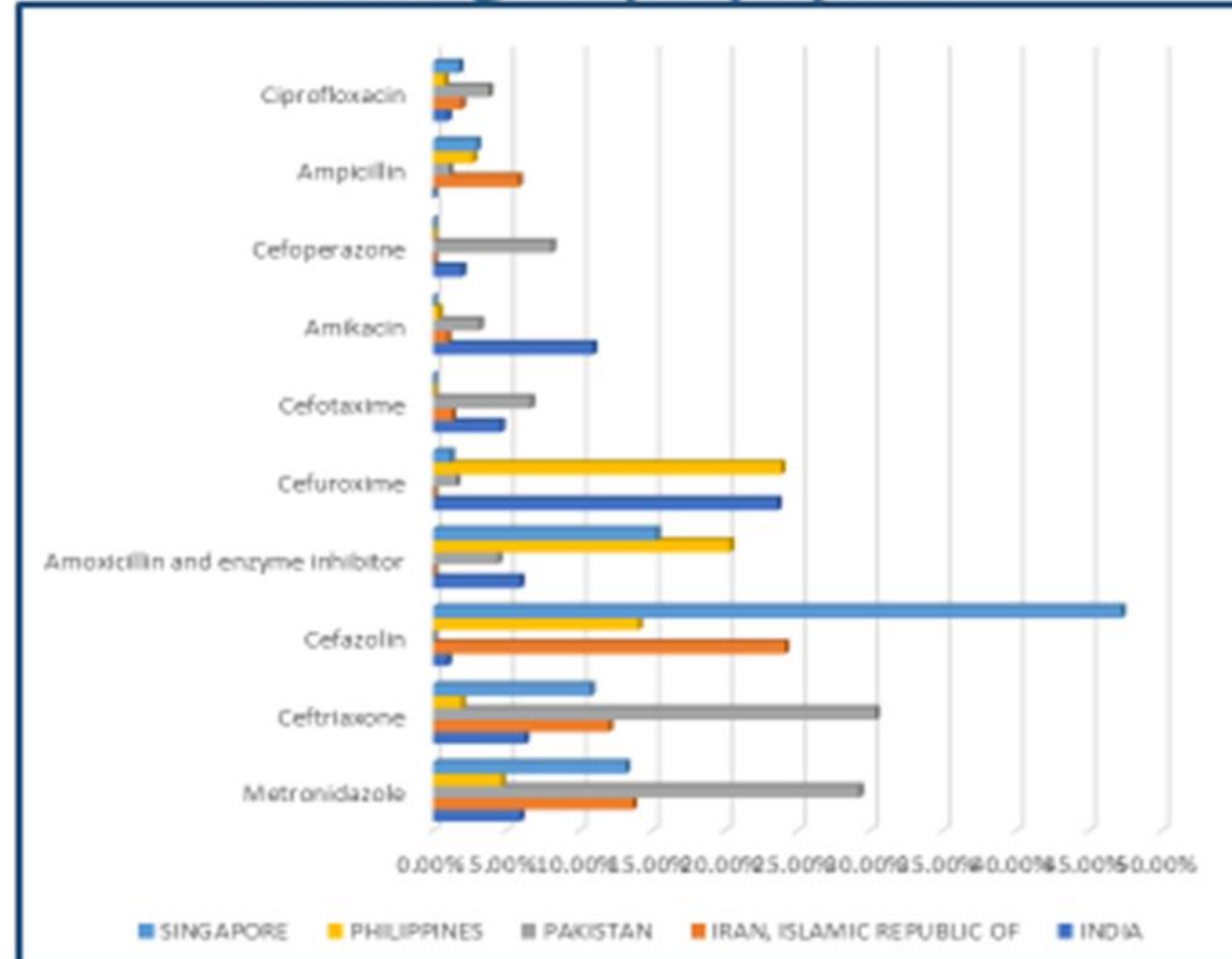
- To study the current state of surgical prophylaxis in 5 Asian countries of variable economic status measured with validated quality indicators
- Use of quality indicators in 5 major group of surgeries common to all these countries
- To understand the existing gaps and probable opportunities
- for overcoming the challenges.

Method:

- The Global Point Prevalence study (Global PPS) is a multi-center, multi-country study on antimicrobial utilization spread across all 5 continents of the globe since 2014. This study is conducted from the University of Antwerp, Belgium under the leadership and guidance of Prof. Herman Goossens.
- As an integral part of the study group, we analyzed the antimicrobial utilization for surgical prophylaxis from India, Iran, Pakistan, Philippines and Singapore between 2015 and 2017, with permission from the respective country coordinators.
- We studied the adherence to the following surgical prophylaxis quality indicators (QI) across the five most common surgical specialties (GI, CVS, OBS-GYN, orthopedic, CNS) and across 5 countries:
- The QI used were:
 - 1) Availability of guidelines for surgical prophylaxis.
 - 2) Compliance to guidelines.
 - 3) Duration for prophylaxis < 24 hours.
 - 4) Documentation of reason/rationale for continuing prophylactic antibiotic for > 24 hours.
 - 5) Documentation of stop or review date

Results

Top 10 most frequently used antibiotics for surgical prophylaxis

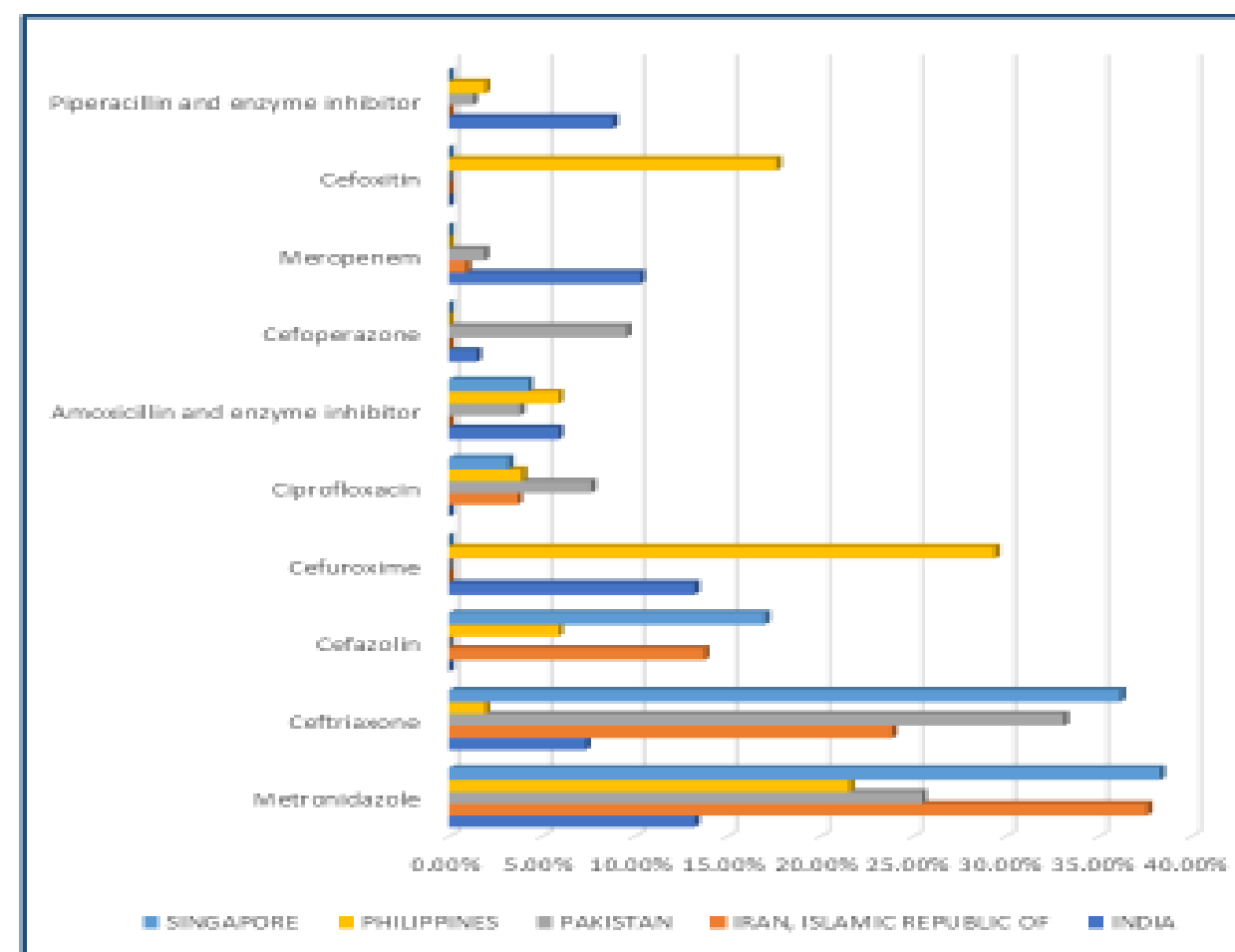


Quality indicators for 5 countries

Country	Total Number	Less than 24hrs	With Guideline	Guideline Compliance	Guideline Compliance (%)	Stop/review date documented	Reason in Notes among more than 24hrs
INDIA	203	22.66%	133	104	78.20%	65.02%	23.57%
IRAN, ISLAMIC REPUBLIC OF	218	23.39%	78	23	30.26%	12.84%	40.12%
PAKISTAN	382	2.09%	0			0.52%	1.60%
PHILIPPINES	246	11.38%	231	143	62.72%	60.57%	52.75%
SINGAPORE	281	45.91%	253	185	73.12%	67.97%	61.18%
Grand Total	1330	19.70%	695	455	65.94%	37.74%	29.78%

Results

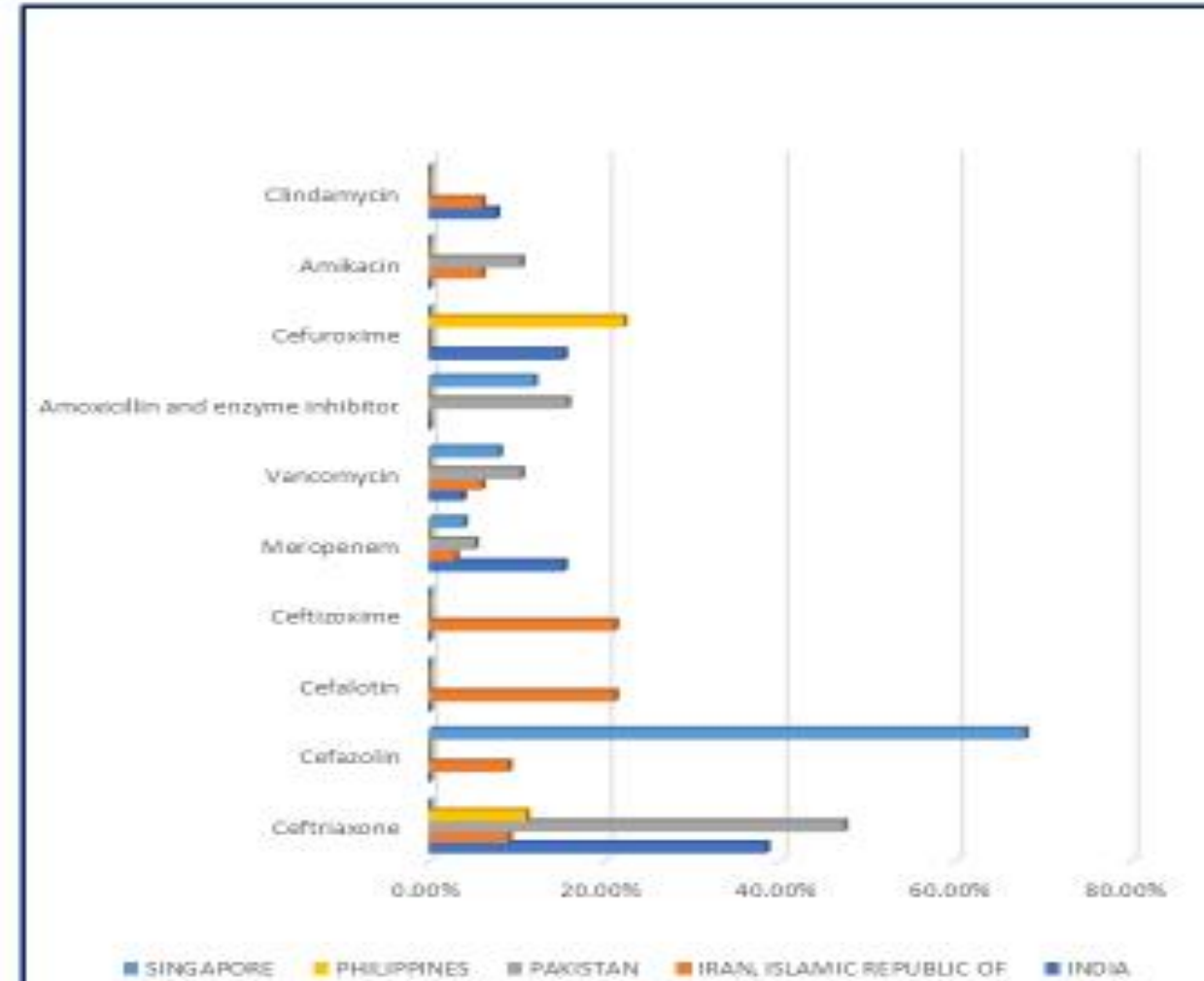
Top 10 most frequently used antibiotics for GI surgical prophylaxis



QI for GI surgical prophylaxis

Country	Total Number	Less than 24hrs	With Guidelines	Guideline Compliant	Guideline Compliance (%)	Stop/review date documented	Reason in Notes among more than 24hrs
INDIA	43	37.21%	29	20	68.97%	67.44%	11.11%
IRAN, ISLAMIC REPUBLIC OF	58	12.07%	35	11	31.43%	18.97%	41.14%
PAKISTAN	100	0.00%	0			0.00%	4.00%
PHILIPPINES	53	13.21%	51	27	55.10%	37.74%	54.35%
SINGAPORE	61	40.98%	57	42	73.68%	60.66%	55.56%
Total	315	17.46%	172	100	58.82%	30.79%	28.46%

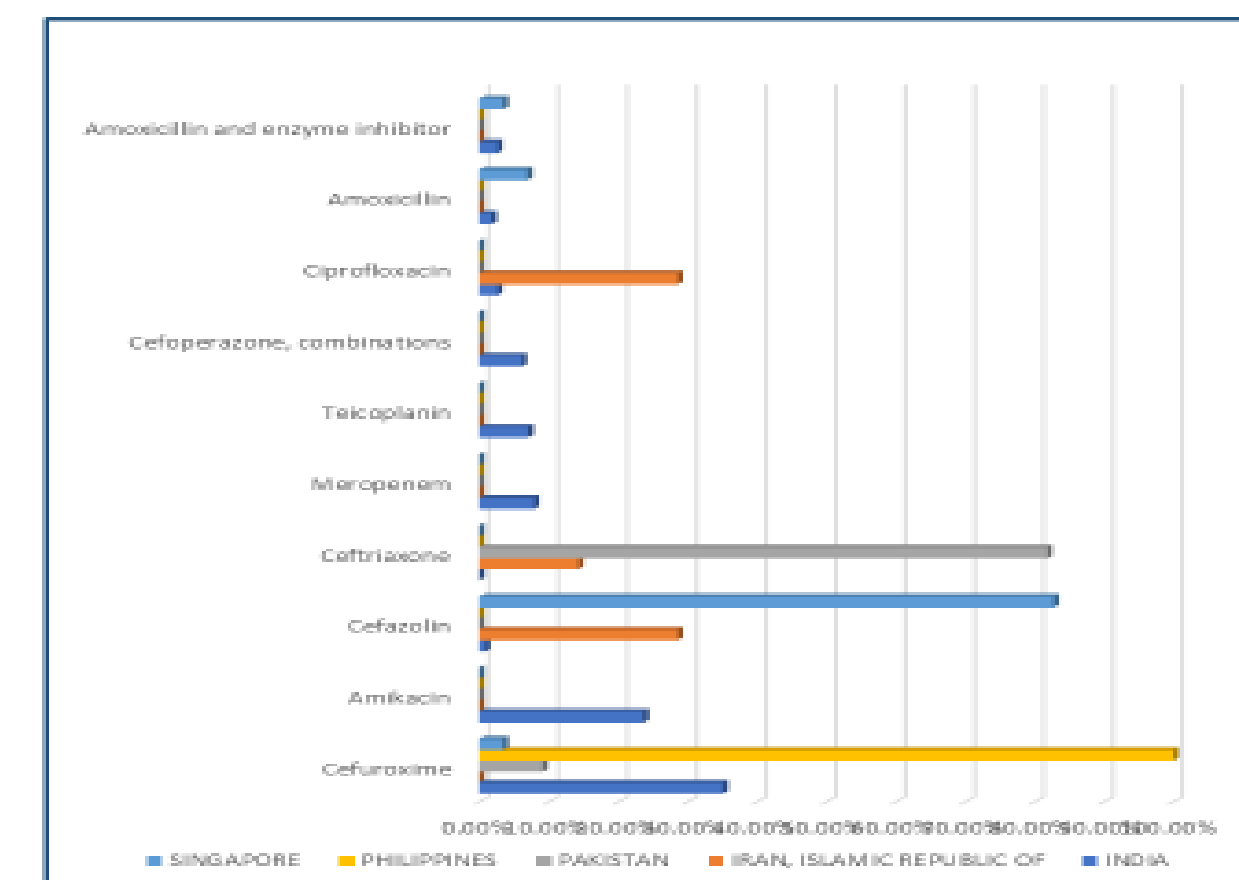
Top 10 most frequently used antibiotics for CNS surgical prophylaxis



QI for CNS surgical prophylaxis

Country	Total Number	Less than 24hrs	With Guidelines	Guideline Compliant	Guideline Compliance (%)	Stop/review date documented	Reason in Notes among more than 24hrs
INDIA	23	52.17%	22	16	72.73%	73.91%	27.27%
IRAN, ISLAMIC REPUBLIC OF	29	20.69%	12	0	0.00%	3.45%	52.17%
PAKISTAN	13	0.00%				7.69%	0.00%
PHILIPPINES	9	0.00%	8	5	62.50%	44.44%	33.33%
SINGAPORE	23	52.17%	19	17	89.47%	82.61%	90.91%
Total	97	30.93%	61	38	62.30%	43.30%	41.79%

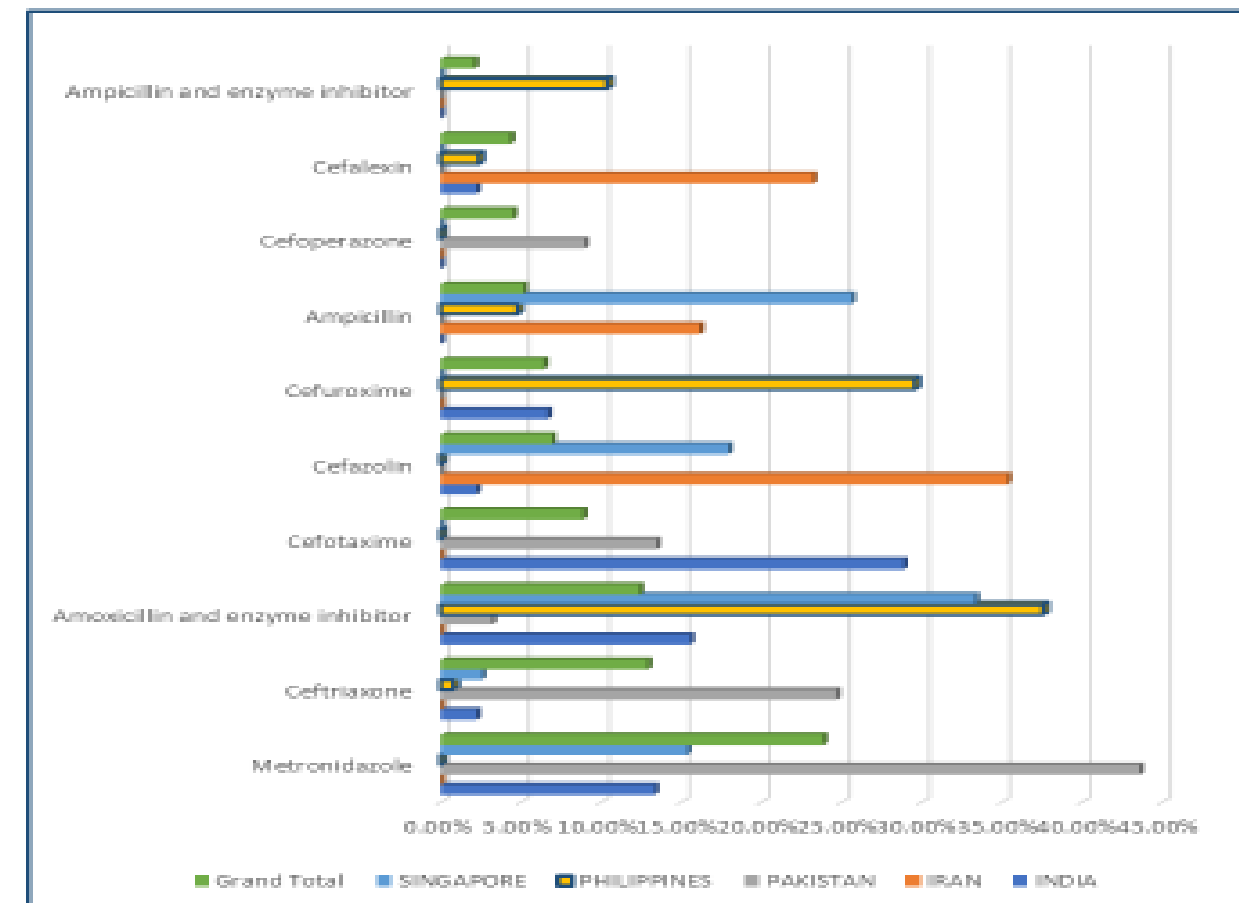
Top 10 most frequently used antibiotics for CVS surgical prophylaxis



QI for CVS surgical prophylaxis

Country	Total Number	Less than 24hrs	With Guidelines	Guideline Compliant	Guideline Compliance (%)	Stop/review date documented	Reason in Notes among more than 24hrs
INDIA	74	9.46%	64	55	85.94%	87.84%	13.43%
IRAN, ISLAMIC REPUBLIC OF	5	0.00%	2	2	100.00%	40.00%	60.00%
PAKISTAN	9	0.00%	0			0.00%	0.00%
PHILIPPINES	2	50.00%	2	1	50.00%	50.00%	0.00%
SINGAPORE	29	48.28%	22	20	90.91%	82.76%	60.00%
Total	119	18.49%	90	78	86.67%	77.31%	21.65%

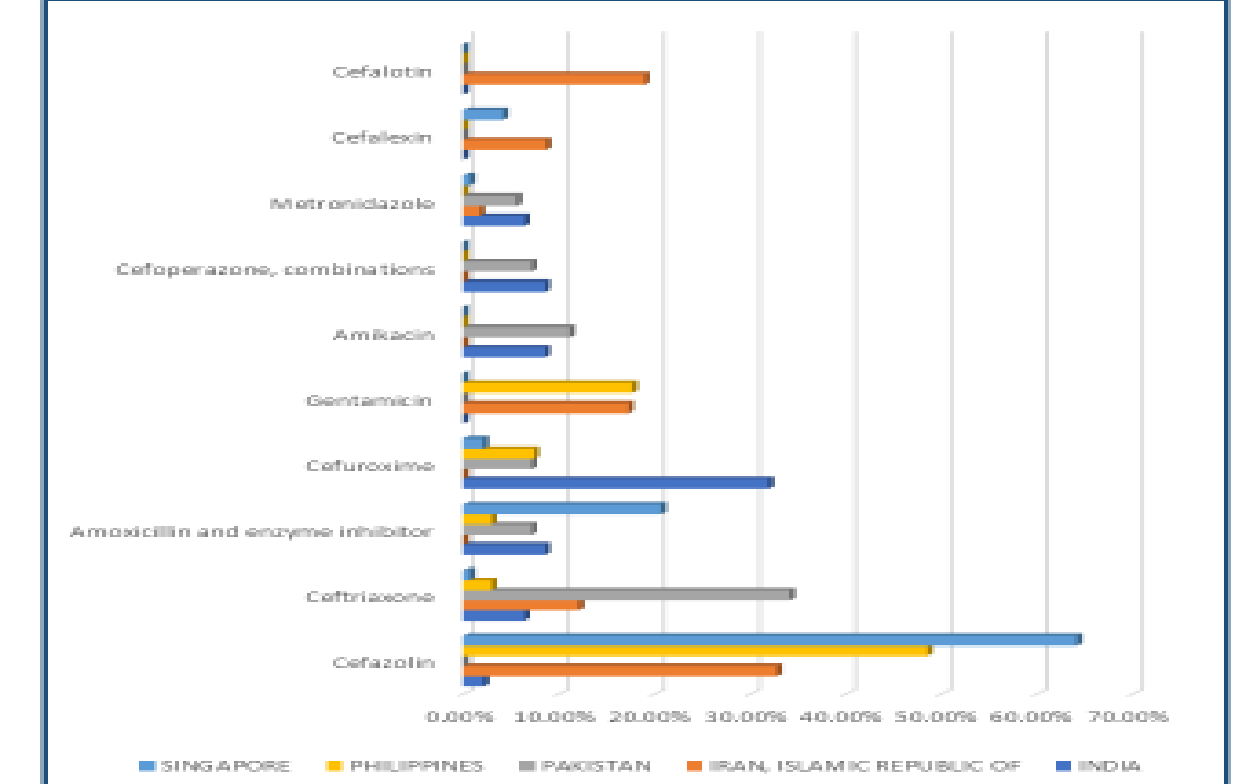
Top 10 most frequently used antibiotics for OBGYN surgical prophylaxis



QI for OBGYN surgical prophylaxis

Country	Total Number	Less than 24hrs	With Guidelines	Guideline Compliant	Guideline Compliance (%)	Stop/review date documented	Reason in Notes among more than 24hrs
INDIA	32	12.50%	1	0	0.00%	28.13%	42.86%
IRAN, ISLAMIC REPUBLIC OF	85	41.18%	8	0	0.00%	4.71%	28.00%
PAKISTAN	167	1.80%				0.00%	1.22%
PHILIPPINES	128	4.69%	119	82	69.49%	83.59%	47.54%
SINGAPORE	31	38.71%	29	23	79.31%	64.52%	73.68%
Total	443	13.54%	157	105	67.31%	31.60%	26.11%

Top 10 most frequently used antibiotics for Bone & Joint surgical prophylaxis



QI for Bone & Joint Surgical prophylaxis

Country	Total Number	Less than 24hrs	With Guidelines	Guideline Compliant	Guideline Compliance (%)	Stop/review date documented	Reason in Notes among more than 24hrs
INDIA	31	22.58%	17	13	76.47%	38.71%	41.67%
IRAN, ISLAMIC REPUBLIC OF	41	7.32%	21	10	52.63%	24.39%	42.11%
PAKISTAN	93	5.38%	0			1.08%	0.00%
PHILIPPINES	54	25.93%	51	28	54.90%	31.48%	72.50%
SINGAPORE	137	48.18%	126	83	65.87%	66.42%	56.34%
Total	356	26.69%	215	134	62.91%	36.80%	36.40%

Discussion (contd.)

Limitations of this study:

- The data has been extracted from a point prevalence study and lacks the robustness of a continuous surveillance
- The number of hospitals from each country that participated are not very high and cannot be generalized to the whole country
- Quality parameters such as “antibiotic given 1 hour prior to surgery”, right dose, right choice (according to guidelines) are missing.
- SSIs and patient outcome are also not coordinated/matched with this data

Conclusions

- Most of the developing countries are yet to consolidate appropriate antimicrobial utilization data as well as hospital associated infection of which surgical site infection is an important component.
- Efforts to minimize utilization of broad-spectrum antibiotics for surgical prophylaxis needs to be encouraged.
- Developing local/national guidelines based on endemic microbial profile is necessary.
- Audit of surgical prophylaxis and use of standard quality indicators along with feedback to surgeons will help in better patient outcome and reduce development of antimicrobial resistance

References:

- Charani E., Ahmad R., Tarrant C et al. Opportunities for system level improvement in antibiotic use across the surgical pathway. Int J Infect Dis 2017;60:29-34
- Bratzler DW, Dellinger PE, Olsen KM, Perl TM et al. Clinical practice guidelines for antimicrobial prophylaxis in surgery. Am J Health-Syst Pharm 2013; 70:195-283
- <http://www.who.int/gpsc/appendix25.pdf>

According to the World Bank GNI (gross national income) data (2019-20). India, Pakistan & Philippines are LMIC (low-middle income) regions. Iran fall in the category of MIC (middle-income) region and Singapore belongs to HIC (high-income) region

Wide variation in antibiotic selection for surgical prophylaxis is seen across all 5 countries, with wide spread use of broad-spectrum antibiotics especially 3rd Gen Cephalosporins

Guidelines are an effective tool to reduce inappropriate use of antimicrobials. However, compliance to guidelines by surgeons also is a challenging issue. The availability of few local (institutional) guidelines are present in India, Iran and Philippines, with a total absence of any guideline in Pakistan. Singapore however has national guidelines which are followed by majority of the surgical specialties. Except for Singapore, continuation of prophylactic antibiotic for >24 hours is high in all other countries with highest use in Pakistan.

Documentation of reasons for prolonged use is missing in high proportion except for Singapore (61.18%). A meta-analysis of 44 RCTs demonstrated that prolonged postoperative antibiotic prophylaxis **had no benefit** when compared to a single dose of antibiotic prophylaxis in reducing surgical site infections after surgery (3)

Lack of documentation of stop/review prophylactic antibiotics is below 1% in Pakistan and relatively poor in Iran.