



Pediatric Results from 26 Canadian Hospitals

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Background

- Inappropriate antimicrobial use (AMU) in hospitalized children contributes to the rise in antimicrobial resistance and leads to adverse events such as allergic reactions and *C. difficile* infections.
- The Global Point Prevalence Survey (Global-PPS) is a standardized and validated tool used worldwide to quantify and characterize inpatient AMU.

Objective

Describe the **prevalence, characteristics** and **appropriateness** of inpatient pediatric AMU in 26 Canadian hospitals that participated in the Global-PPS in 2018.

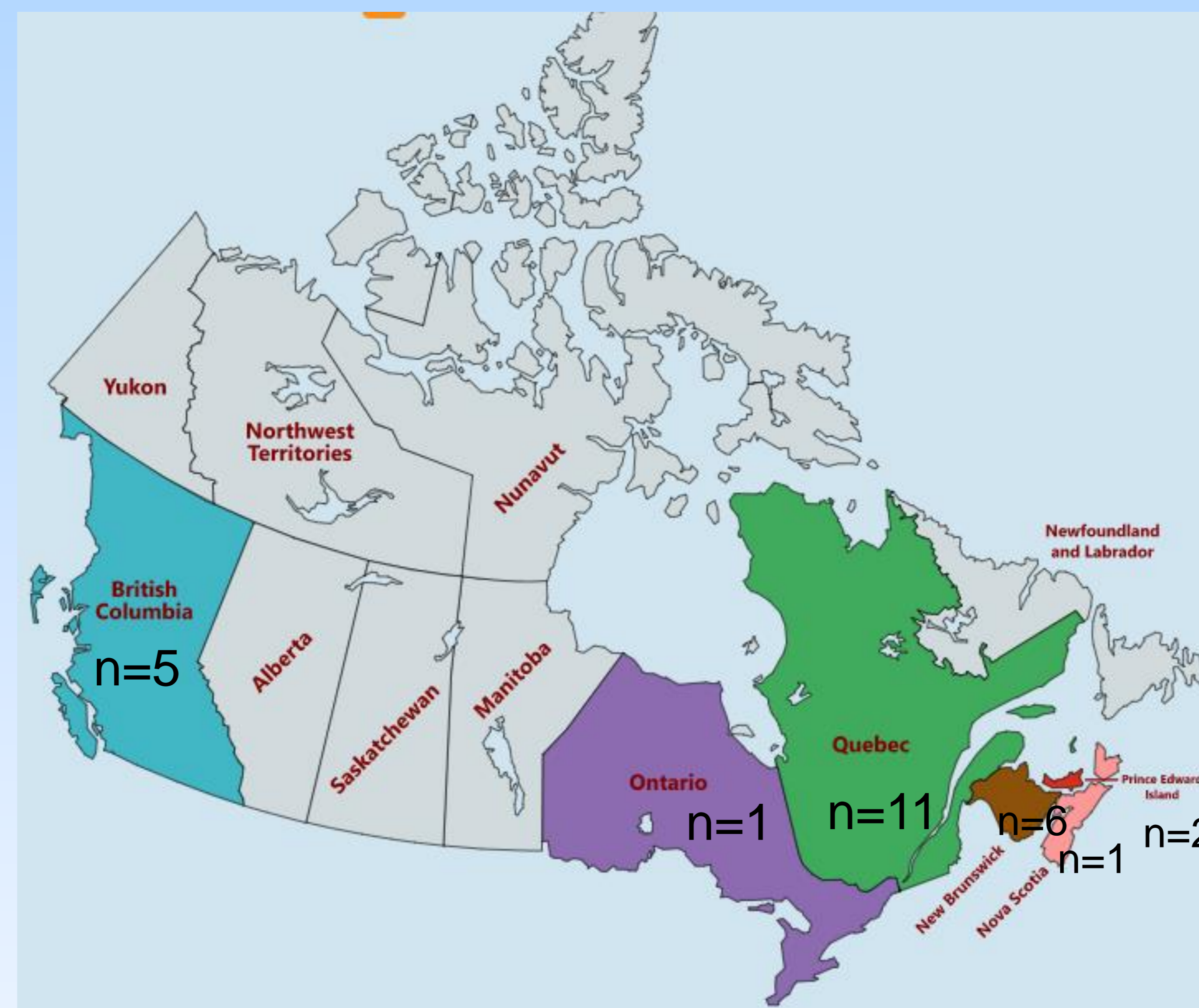
Methods

The survey was completed by each site on a chosen day between January and December 2018.

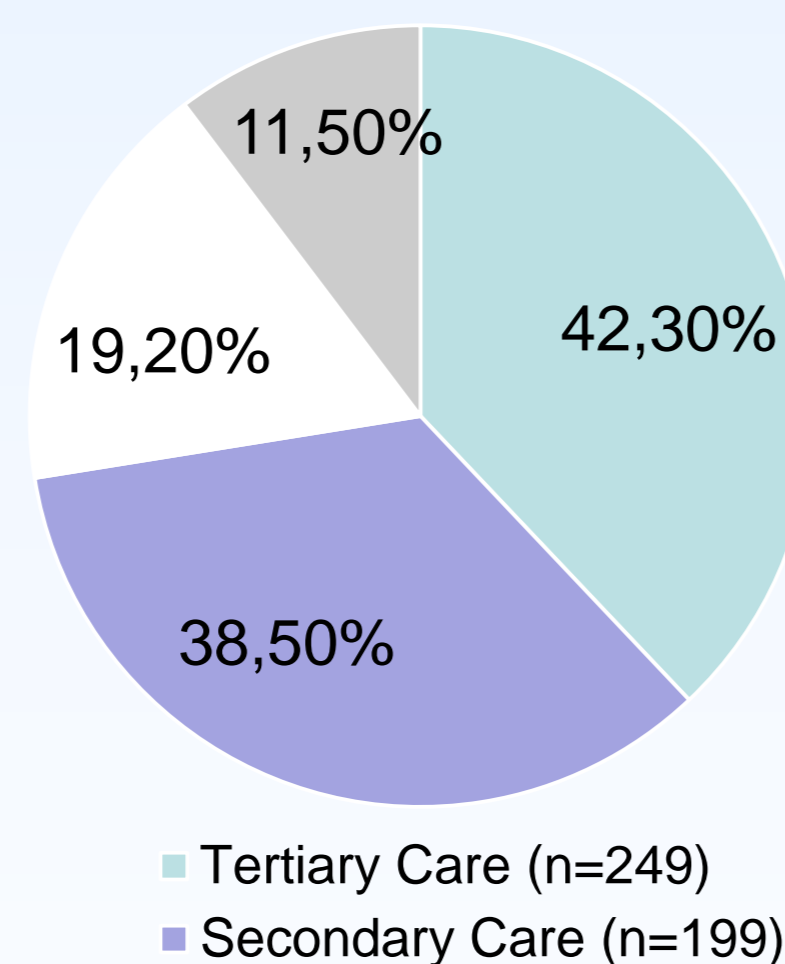
- Data entered into the Global-PPS website (www.global-pps.com)
- Patient Inclusion criteria:**
 - aged 0-17 years
 - hospitalized on a pediatric or neonatal ward
 - receiving at least one antimicrobial agent at 8:00 am on the survey day.
- Patient-level data** collected included:
 - Demographics, ward type
 - Antimicrobial data: agent(s), dose, frequency, route
 - Infection data: diagnosis, type of indication (community-acquired infection [CAI], healthcare-associated infection [HAI], surgical prophylaxis [SP], medical prophylaxis [MP]), type of therapy (empiric vs. targeted), relevant biomarker data and microbiology results.
- Quality indicators** collected included:
 - local guideline compliance, SP duration and medical record documentation of indication for and stop/review date of antimicrobial
- Ward-level data** comprised department type and activity (medicine, surgery, intensive care).
- Denominator** was the ward census at 8:00 am on the survey day

Hospital Demographics

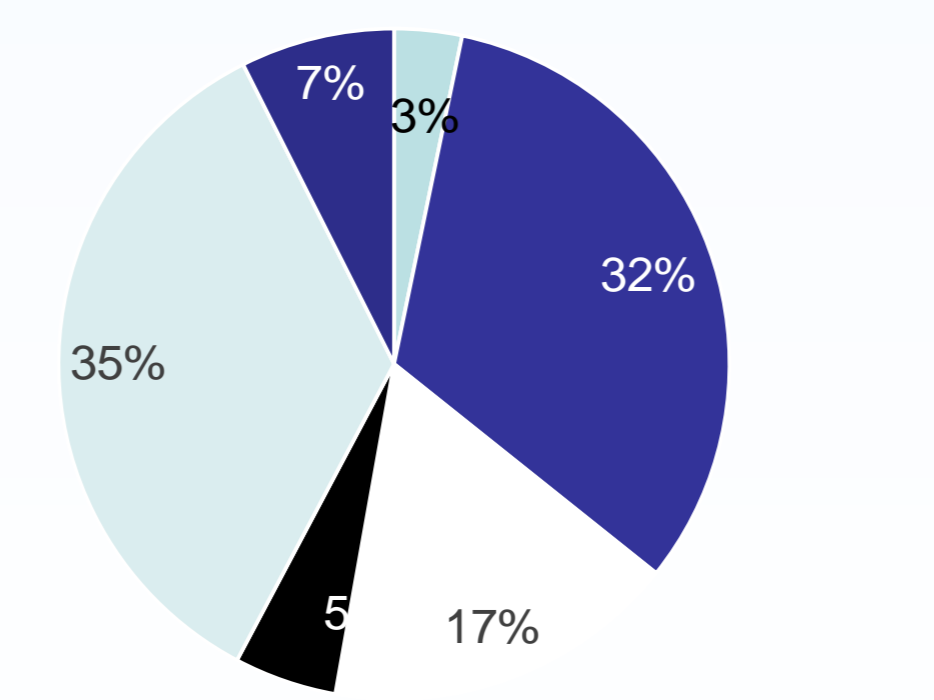
- Of the 26 sites, 23 were mixed (adult and pediatric) and 3 were pediatric hospitals, with data on 767 inpatients on 93 pediatric wards.
- The majority of centers were teaching hospitals (65.3%)



Type of Center

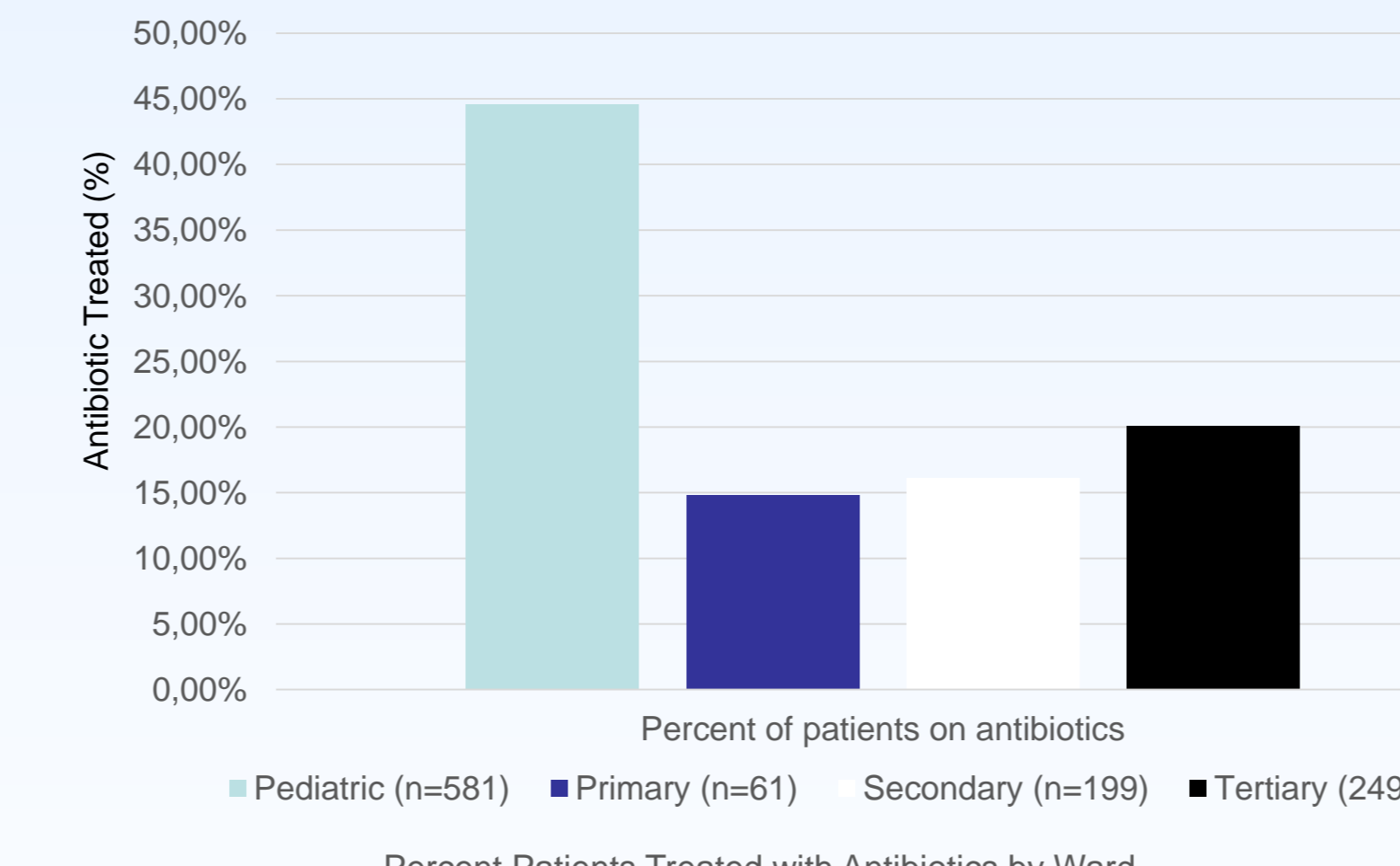


Percent of Beds by Service

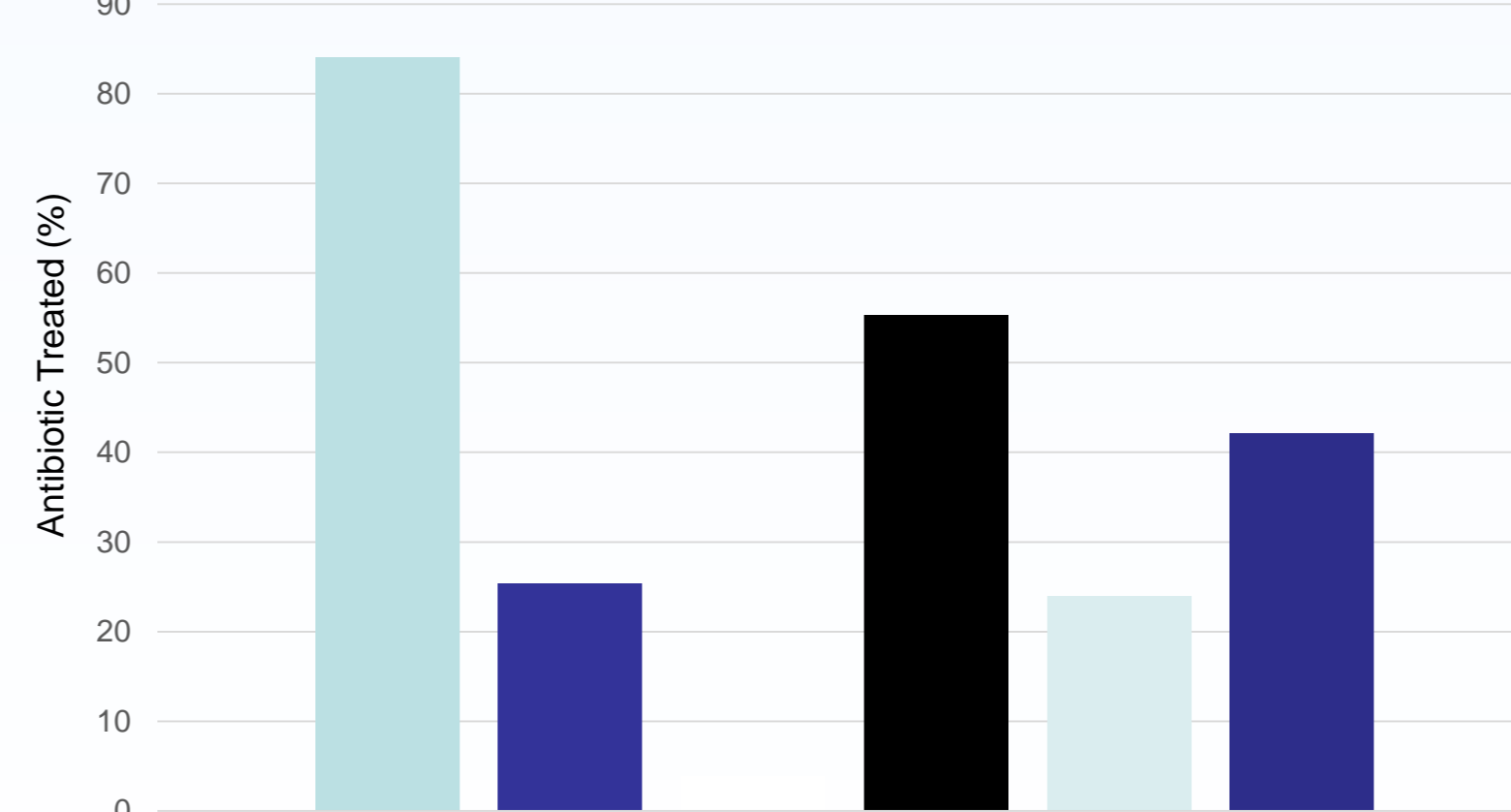


■ Haematology-Oncology PMW ■ Neonatal Intensive Care Unit
 ■ Neonatal Medical Ward ■ Paediatric Intensive Care Unit
 ■ Paediatric Medical Ward ■ Paediatric Surgical Ward

Percent of Patients on Antibiotics by Center type



Percent Patients Treated with Antibiotics by Ward



■ Haematology-Oncology (n=25) ■ Neonatal Intensive Care Unit (n=249)
 ■ Neonatal Medical Ward (n=131) ■ Paediatric Intensive Care Unit (n=38)
 ■ Paediatric Medical Ward (n=267) ■ Paediatric Surgical Ward (n=57)

Results

Patient Demographics

Of the 767 patients admitted to hospitals, 198 patients received at least one antibiotic. Overall 330 antibiotic orders were reviewed. Patients treated with antibiotics were 64.5% male

Age range of antibiotic treated patients

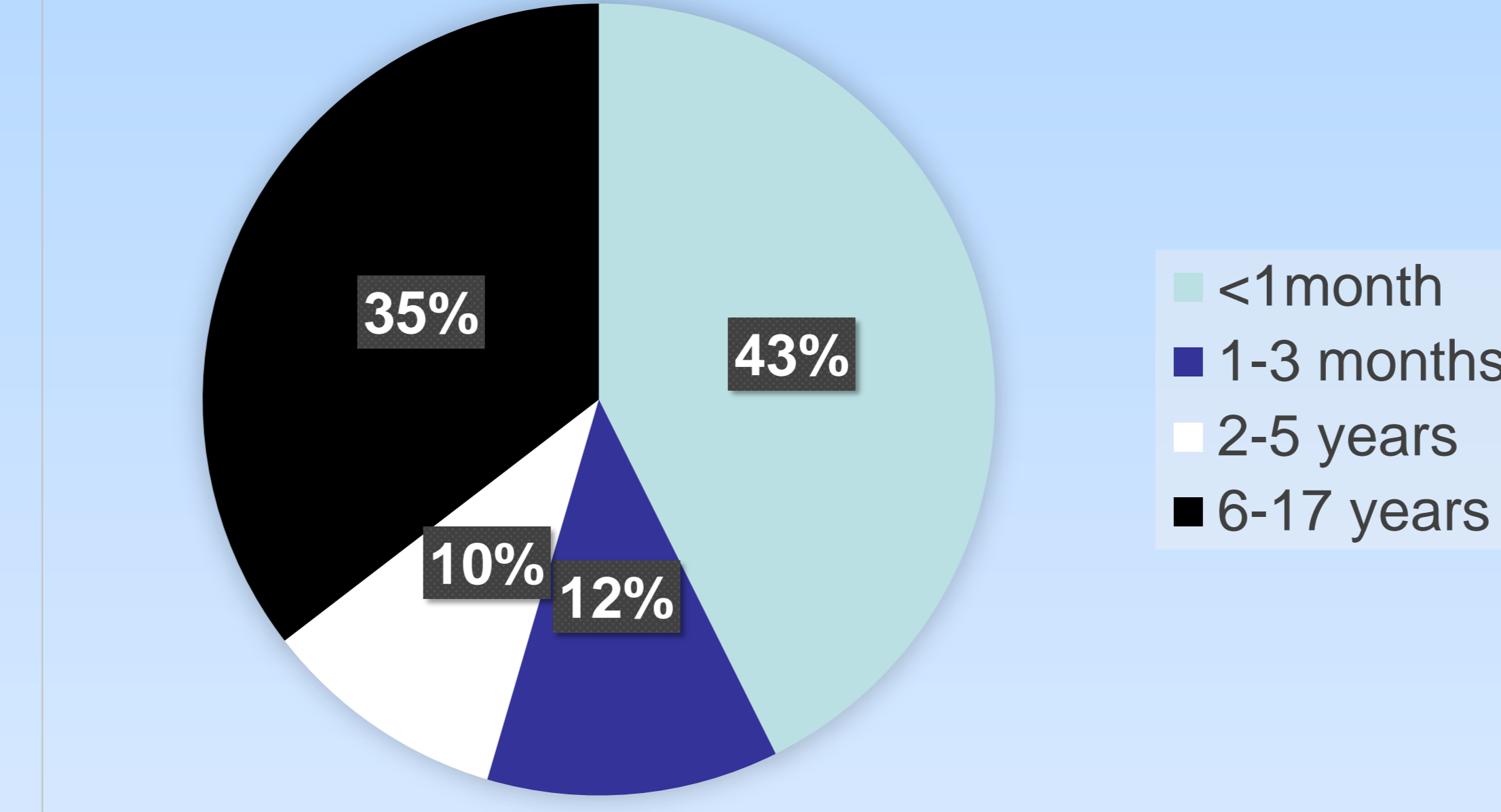


Table 1: Indication for broad spectrum antimicrobial

	Cefotaxime/ Ceftriaxone	Carbapenem	Quinolone	Pip-Tazo
Sepsis	21.1%	8.3%		
CNS	15.8%	8.3%		
Respiratory	18.4%			14.3%
Prophylaxis				28.6%
Genitourinary	5.3%	8.3%	14.3%	14.3%
FUO	13.2%			
GI / Abdo	7.9%			14.3%
FUO-HO	2.6%		14.3%	14.3%
ENT	10.5%	8.3%		
Other	2.6%	8.3%		
SST/BJ		25%	14.3%	14.3%
FN		25%		

CNS: Central Nervous System, FUO: Fever of Unknown Origin, GI/Abdo: Gastrointestinal or intra-abdominal, FUO-HO: Fever of unknown origin in Hematology patients, ENT: Ear, Nose and Throat, SST/BJ: Skin and soft tissue and bone and joint, FN: Febrile Neutropenia

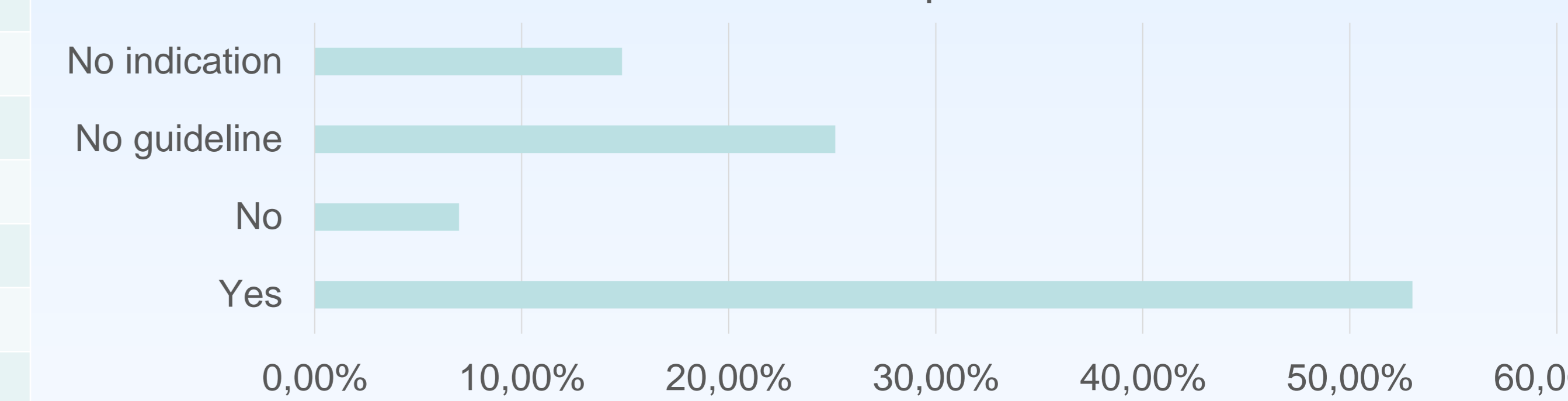
Antimicrobial Utilization

- Antibiotics were prescribed for Community acquired infections (40.9%), and Hospital acquired infections (20.0%), Surgical prophylaxis (2.7%) and for unknown or other reasons in 13.3% of patients
- 106 of the 330 patients used a serum CRP to assist in their management..
- 87.9% of patients had the indication for antibiotics documented in the chart

Table 1: Rate of antimicrobial use by hospital type

Drug Name	Paediatrics	Primary	Secondary	Tertiary
Aciclovir	6	0	3	1
Amino-Penicillins	10	1	1	5
Azithromycin	18	4	12	10
Caspofungin	3	0	0	2
Cefazolin/Cephalexin	3	0	0	2
Cefoxitin	12	0	3	5
Ceftriaxone/Cefotaxime	21	2	5	10
Ceftazidime	3	0	0	0
Ciprofloxacin	4	0	1	0
Cloxacilin	4	0	0	1
Carbapenems	12	1	10	13
Gentamicin	5	0	2	1
Metronidazole	6	0	0	2
Nystatin	6	0	0	3
Pip-Tazocin	7	0	2	1
Septra	16	0	3	2
Tobramycin	18	0	1	2
Vancomycin	9	2	1	1
Voriconazole	8	0	4	5

Guideline Compliance



Conclusion

The Global-PPS provides quantifiable outcome measures to assess and compare quantity and quality of antimicrobial prescribing and resistance in hospitalized children in Canadian hospitals. Antimicrobial prevalence rates were highest in Pediatric and Tertiary care centers. Genitourinary and Skin and soft tissue infections/bone and joint infections were noted to have broad spectrum antibiotic coverage. Over 25% of prescribed antibiotics had no guidelines and 15% had no indication documented. These data serve to identify targets for quality improvement of antimicrobial prescribing, the development of local guidelines, education and practice changes.