

Profile of antimicrobial use in a teaching hospital

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Background

- Accreditation Canada requires the presence of an **antimicrobial stewardship program** to ensure the optimal use of medications.
- **Testing for compliance** includes the need to periodically verify usage and share this data with clinicians.

Objectives

- Describe the **profile of antimicrobial use** in a mother-child teaching hospital.

Methods

- **Descriptive, retrospective** study;
- Data extraction :
 - From **April 1st 2021 to March 31st 2022**;
 - From the Pharmacy Information System (CGSI Inc, Qu bec, Qu bec, Canada)
- **Number of days of therapy (DOT)** was calculated globally and by antimicrobial (n=93);
- **Ratios of DOT/1000 patient days** were calculated globally, by therapeutic class (e.g. antibiotics, antivirals, antifungals and others) and by patient care unit:
 - Obstetrics-gynecology, Nursery, Pediatrics, Psychiatry, Surgery, Intensive care (PICU), Neonatology (NICU), Oncology, Rehabilitation center.
- Repartition of DOT/1000 patient days (PD) antimicrobials according to the World Health Organization AWaRe classification (e.g. Access, Watch and Reserve) were calculated.
- No statistical analysis were conducted.

Results

- **70527.0 DOT** and 672.5 DOT/1000 patient day **in 2021-2022**, compared with **67578.0 DOT** and 696.6 DOT/1000 patient days **in 2020-2021**. (Fig 1)
- Overall, **93 antimicrobials** were extracted.
- The number of DOT/1000 patient days were (Table I.):
 - **Antibiotics**: 550.8;
 - **Antivirals**: 46.5;
 - **Antifungals**: 67.9;
 - **Others**: 7.3.
- The ratios varied by **antimicrobial** used (Table I.):
 - **0.02** as minimum value for **ribavirine**;
 - **77.5** as maximum value for **piperacillin-tazobactam**.
- They also varied by **patient care unit** (Fig 2):
 - **0.06** as minimum value in **surgery**;
 - **336.93** as maximum value in **oncology**.
- The repartition of DOT/1000 patient days according to the AWaRe classification applicable to 52 of the selected antimicrobials (Fig 3)
 - **Access** group: **34.6%** (18/52);
 - **Watch** group: **53.8%** (28/52).
 - **Reserve** group: **11.5%** (6/52).

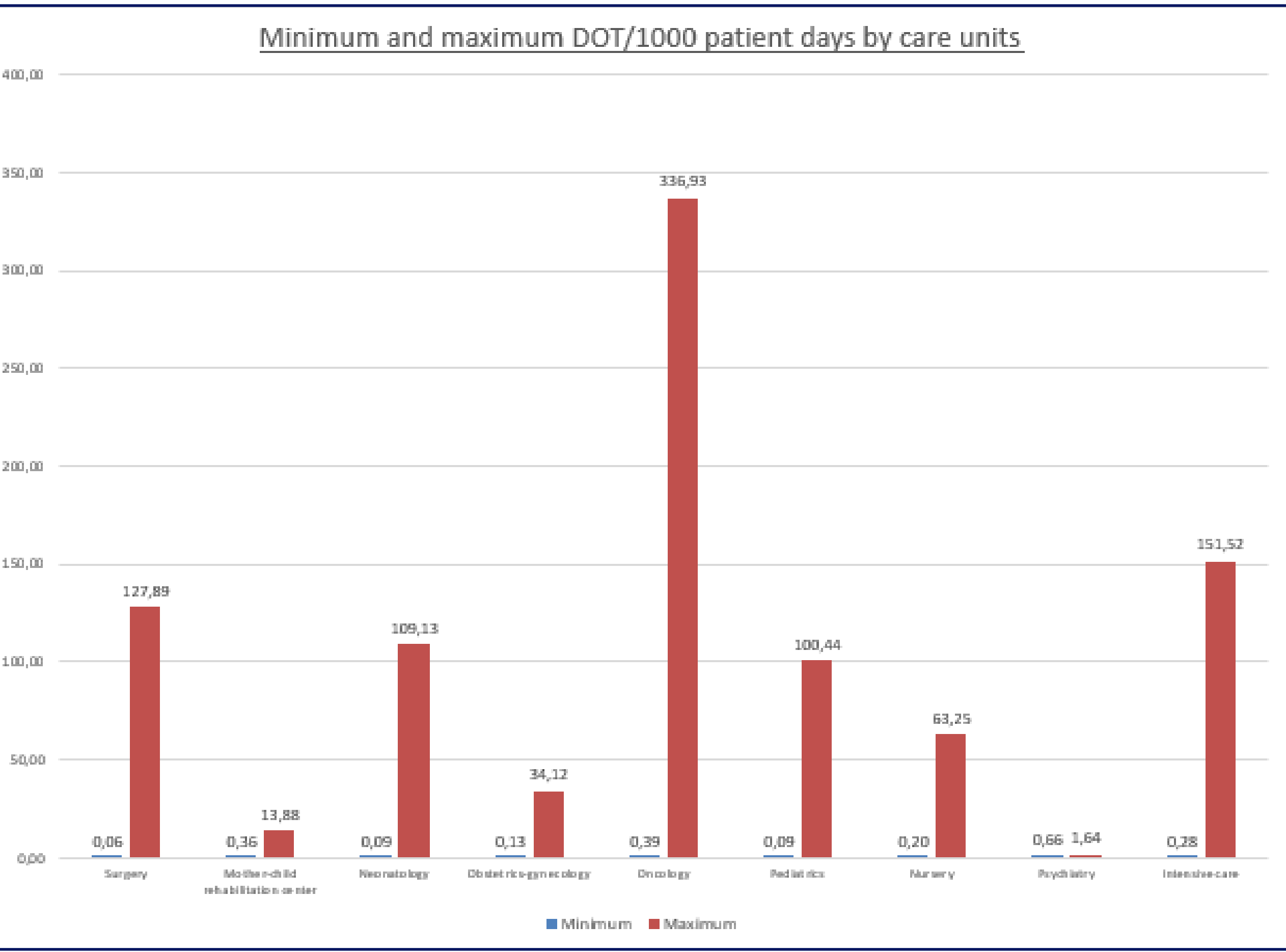


Fig 2. Minimum and maximum DOT/1000 patient days by care units in 2021-2022

Table I. DOT/1000 patient days by antimicrobial in 2021-2022

Antimicrobial	DOT/1000 PD	Antimicrobial	DOT/1000 PD
Antibiotics		Antibiotics	
Amikacin	1.18	Rifabutin	0.02
Amoxicillin	39.61	Rifampin	0.56
Amoxicillin-Clavulanic acid	22.49	Streptomycin	0.00
Ampicillin	45.29	Sulfadiazine	0.00
Azithromycin	5.67	Sulfasalazine	0.22
Aztreonam	0.00	Tetracycline	0.00
Cefaclor	1.64	Ticarcillin-Clavulanic acid	0.00
Cefadroxil	10.15	Tigecycline	0.08
Cefazolin	47.50	Tobramycin	23.23
Cefepime	0.65	Trimethoprim	55.40
Cefixime	3.89	Vancomycin	41.25
Cefotaxime	36.91	Antivirals	
Cefoxitin	2.24	Aciclovir	18.79
Cefprozil	0.92	Cidofovir	0.67
Ceftazidime	6.58	Darunavir	0.22
Ceftriaxone	11.35	Etravirine	0.00
Cefuroxime	0.11	Famciclovir	0.00
Cephalexine	11.81	Foscarnet	1.18
Chloramphenicol	0.00	Ganciclovir	3.96
Ciprofloxacin	5.11	Oseltamivir	0.14
Clarithromycin	3.85	Ribavirin	0.02
Clindamycin	10.08	Saquinavir	0.00
Cloxacillin	11.78	Valaciclovir	15.95
Colisthimethate	0.00	Valganciclovir	4.08
Dapsone	0.04	Zanamivir	0.00
Daptomycin	0.00	Zidovudine	1.52
Doripenem	0.00	Antifungals	
Doxycycline	2.34	Amphotericin b	2.51
Ertapenem	0.88	Caspofungin	2.01
Erythromycin	4.76	Fluconazole	31.58
Ethambutol	1.35	Flucytosine	0.07
Gatifloxacin	0.00	Itraconazole	0.44
Gentamicin	17.51	Ketoconazole	0.20
Imipenem	0.03	Micafungin	27.61
Isoniazid	0.57	Nystatin	0.00
Levofloxacin	10.15	Posaconazole	2.75
Linezolid	1.11	Voriconazole	0.77
Meropenem	17.56	Others	
Metronidazole	9.40	Artesunate	1.63
Minocyclin	0.00	Atovaquone-proguanil	1.79
Moxifloxacin	0.00	Mebendazole	0.02
Nitrofurantoin	1.93	Mefloquine	0.00
Paromomycin	0.00	Pentamidine	5.29
Penicilin G	2.93	Praziquantel	0.00
Penicilin V	3.64	Primaquine	0.00
Piperacillin	0.00	Pyrantel	0.00
Piperacillin-Tazobactam	76.54	Pyrimethamine	0.00
Pyrazinamide	0.51	Quinine	0.00

Abbreviations: DOT: Days of therapy; PD: Patient Days

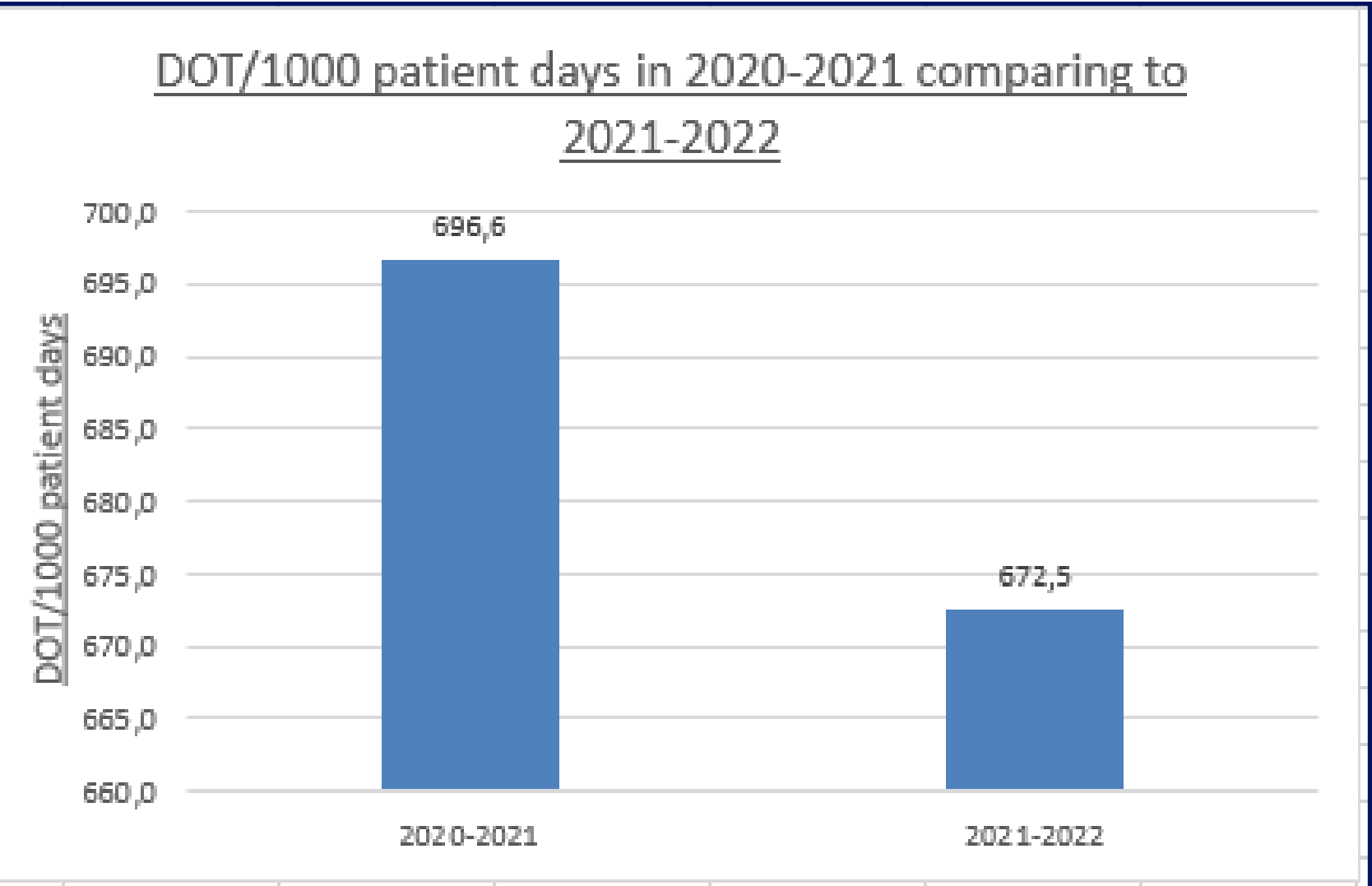


Fig 1. DOT/1000 patient days in 2020-2021 comparing to 2021-2022

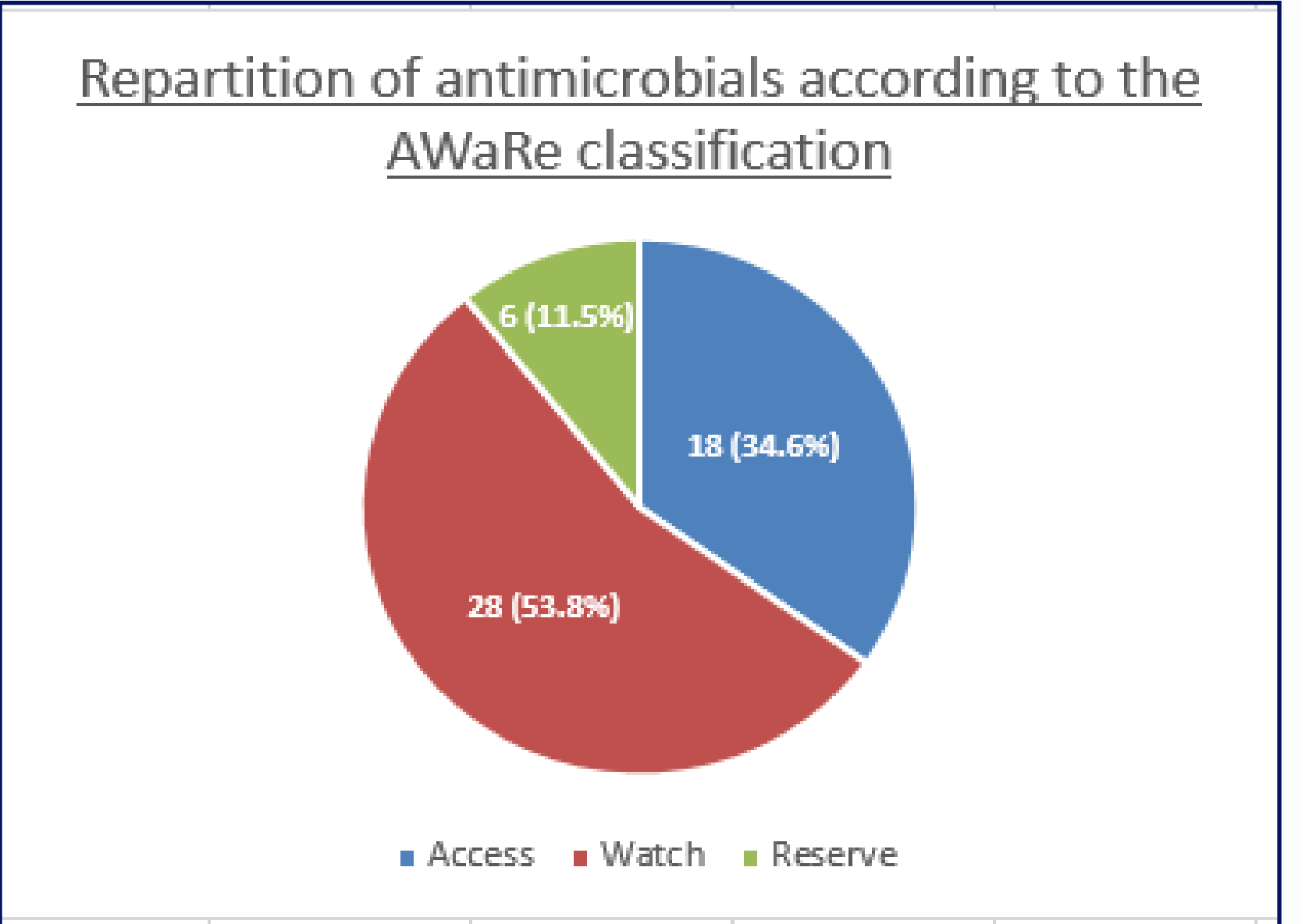


Fig 3. Repartition of DOT/1000 patient days antimicrobials according to the AWaRe classification in 2021-2022

Discussion/Conclusion

- There are relatively **few pediatric published** data from hospitals on the use of antimicrobials.
- Antimicrobial stewardship is based on an **individual activity** targeted by prescription as part of the care provided to the patient as well **as global surveillance** to comment on the evolution of practices within a setting.

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