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# OUTPATIENT ANTIBIOTIC CONSUMPTION AT VILA CENTRAL HOSPITAL: JANUARY 2018 TO DECEMBER 2021

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# INTRODUCTION

- In 2015 WHO declared Antimicrobial Resistance (including antibiotic resistance) a Global Threat to Public Health and Development
- World Health Assembly members asked to implement National Action Plan (NAP) to contain Antimicrobial Resistance
- NAP Objective 4: optimise the use of antimicrobials through Antimicrobial Stewardship Programmes (ASPs)
- Monitoring and analysing antibiotic consumption is a key element of an Antimicrobial Stewardship Programme.

## Research Objective:

- To examine outpatient antibiotic consumption and AWWaRe prescribing at Vila Central Hospital (VCH) January 2018 to December 2021



# METHODS

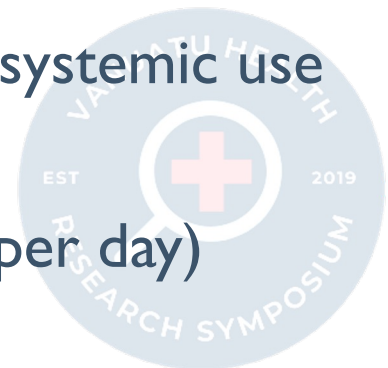
## Terminology:

- ASPs [Antibiotic Stewardship Programs]
- EML [Essential Medicines List]
- WHO's ATC/DDD classification [Anatomical Therapeutic Chemical/Defined Daily Dose classification]
- DIDs [Defined daily dose per 1000 inhabitants per day]
- AWaRe Classification [Access, Watch and Restrict antibiotics]



# METHODS

- Antibiotics included in this study are listed on the Vanuatu EML
- Dispensed from VCH Pharmacy window to outpatients;
- Monthly quantities of each antibiotic prescribed between Jan. 2018 and Dec. 2021 obtained from VCH's M-Supply database (Pharmacy database);
- WHO's ATC/DDD Index interrogated to obtain ATC code and DDD unit of measurement for each antibiotic;
  - Only antibiotics classified into ATC code J01 indicating antibacterials for systemic use were included.
  - Outpatient consumption reported as DIDs (DDD per 1000 inhabitants per day)



# METHODS

- We calculated monthly: 1). DDDs and 2). DIDs in the following ways:

$$1). \text{Total DDDs per antibiotic per month} = \frac{\text{Total quantity consumed per month (gms)}}{\text{DDD unit (gms)}}$$

$$2). \text{Total DIDs per antibiotic per month} = \frac{\text{Total monthly DDDs} \times 1000}{\text{VCH's annual catchment population} \times 30} \\ \text{(average number of days per month)}$$

- T-tests were used to compare differences in mean monthly consumption
- A  $p$ -value of  $\leq 0.05$  was considered statistically significant
- Statistical analysis was conducted using Stata version 15 (Stata Corp.)



# RESULT

10 Antibiotics consumed by outpatients included in the Study

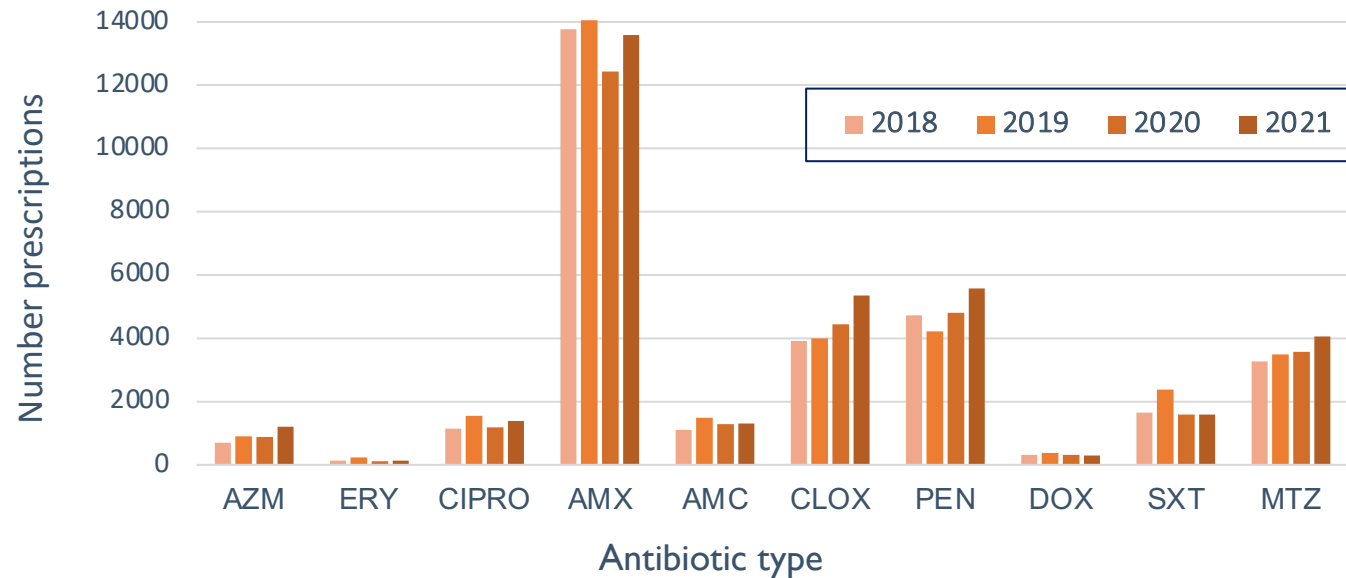
Table includes

- Antibiotic class
- ATC code
- Route of administration
- DDD unit of measurement
- AWaRe class

Antibiotic	Class	ATC code	Route	DDD units (grams)	AWaRe Class
Amoxicillin	Penicillins	J01CA04	oral	1.5	Access
Amoxicillin clavulanate	Beta-lactam/beta-lactamase inhibitor	J01CR02	oral	0.625	Access
Azithromycin	Macrolides	J01FA10	oral	0.3	Watch
Ciprofloxacin	Fluoroquinolones	J01MA02	oral	1	Watch
Cloxacillin	Penicillins	J01CF02	oral	2	Access
Doxycycline	Tetracyclines	J01AA02	oral	0.1	Access
Erythromycin	Macrolides	J01FA01	oral	1	Watch
Metronidazole	Imidazole	J01XD01	oral	1.5	Access
Phenoxymethylpenicillin	Penicillins	J01CE02	oral	2	Access
Sulfamethoxazole Trimethoprim	SXT Combinations	J01EE01	oral	4	Access

# RESULTS

**Annual outpatient prescriptions by antibiotic:  
2018 - 2021**



**Annual Outpatient Prescriptions**

	2018	2019	2020	2021
<b>Total prescriptions</b>	30,719	32,671	30,621	34,475
<b>% Penicillins</b>	77%	73%	75%	75%

AZM = azithromycin, ERY = erythromycin, CIP = ciprofloxacin; AMOX = amoxicillin, AUG = augmentin, CLOXA = cloxacillin, PEN = penicillin, DOX = doxycycline, SXT = cotrimoxazole, MNZ = metronidazole.



# RESULTS

Antibiotic Consumption	2018	2019	2020	2021
<b>Total DDDs</b>	147,224	152,014	143,442	166,831
<b>Total DIDs</b>	48.42	49.07	45.39	51.81
<b>Mean monthly DIDs</b>	4.02	4.09	3.78	4.32

DDD = defined daily dose

DID = DDDs per 1000 inhabitants per day  
(based on VCH's annual catchment population = Shefa)

## Difference in mean monthly DIDs

2018 and 2019 – no statistical difference

2019 and 2020 – no statistical difference

2020 and 2021 = 0.55  $p$  value 0.0065 (95% CI 0.9; 0.16)

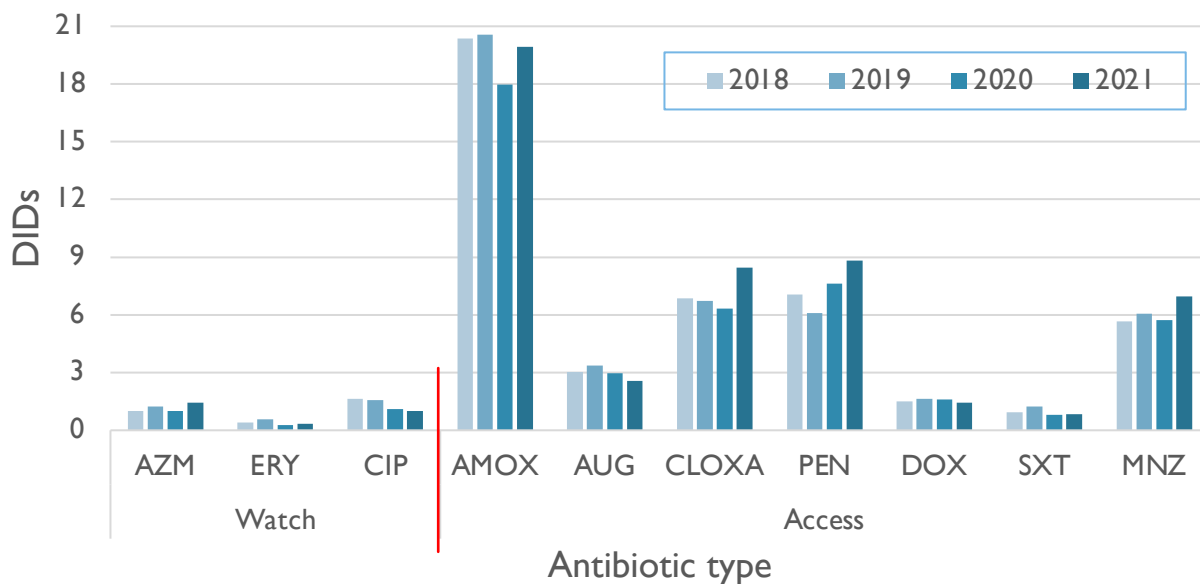
There was a statistically significant increase in outpatient consumption between 2020 and 2021





# RESULTS

DIDS per year by Aware class: 2018 to 2021



Watch: AZM = azithromycin, ERY = erythromycin, CIP = ciprofloxacin;  
 Access: AMOX = amoxicillin, AUG = augmentin, CLOXA = cloxacillin, PEN = penicillin, DOX = doxycycline, SXT = cotrimoxazole, MNZ = metronidazole; \*DDD = defined daily dose.

DIDs (% total consumption)

Aware Class	2018	2019	2020	2021
<b>Watch</b>	3.06 (6)	3.38 (6)	2.37 (4)	2.76 (5)
<b>Access</b>	45.36 (94)	45.69 (94)	43.07 (96)	49.05 (95)



## DISCUSSION

- Possibly first study about antibiotic consumption conducted in Vanuatu
- Steady consumption between 2018 and 2020 with a significant increase between 2020 and 2021
- One study found for PICTs – Samoa in 2007 but cannot compare results as data sources and analysis differ and study almost 20 years old
- Study limited to VCH therefore, cannot generalize results to other health settings in Vanuatu



# RECOMMENDATIONS

## Need to:

- Build a picture of antibiotic consumption in Vanuatu across all health settings:
  - MoH – Referral hospitals, Provincial hospitals, Health Centres; Village Aid posts
  - Private Practice - Private hospitals, GP and Dental clinics, Pharmacies
- Complement **outpatient** consumption with Point Prevalence Surveys about antibiotic prescribing in **inpatient** settings
- Share results at all levels



# RECOMMENDATIONS

## Why is it Necessary to:

- Regularly monitor and analyse antibiotic consumption across health settings in Vanuatu

## **Antibiotic consumption an important element in AS programs**

- Results can be used to:
  - Track dispensing using local data and set national targets for improvement
  - Assess effectiveness of strategies implemented to influence prescribing e. g. adherence to treatment guidelines
  - Make comparisons with health settings in Vanuatu, PICTs, Internationally
  - Inform antibiotic policies



# ACKNOWLEDGEMENTS

- Vila Central Hospital
  - Vanuatu Drugs and Therapeutics Committee
- And
- The Vanuatu Ministry of Health

## Reference:

Hollingworth S. & Kairuz T. Measuring Medicine Use: Applying ATC/DDD Methodology to Real-World Data. *Pharmacy (Basel)* **9**, doi:10.3390/pharmacy9010060 (2021).

