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# COLLABORATION OF SUPPLY CHAIN MANAGEMENT WITH CLINICIANS TO MANAGE DRUG SHORTAGES

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## BACKGROUND / AIM

Antimicrobial shortages are common. The annual frequency of widespread antimicrobial shortages was reported to increase by 283% from the period of 2006 to 2010.<sup>1</sup> Antimicrobials represented 13% of the total drug shortages which is second behind oncology drugs.<sup>2</sup> In early 2019, there was a global shortage of aztreonam, an antibiotic which is commonly used as an alternative in beta-lactam allergy. To control usage and to prevent out-of-stock situation, close communication between the hospital supply chain management (SCM) and the antimicrobial stewardship (AMS) teams is crucial to aid in the timely institution of multidisciplinary strategies. The SCM and AMS team are well-positioned to aid in mitigation of antimicrobial shortages through interventions such as drug therapy restrictions or substitutions.<sup>3</sup>

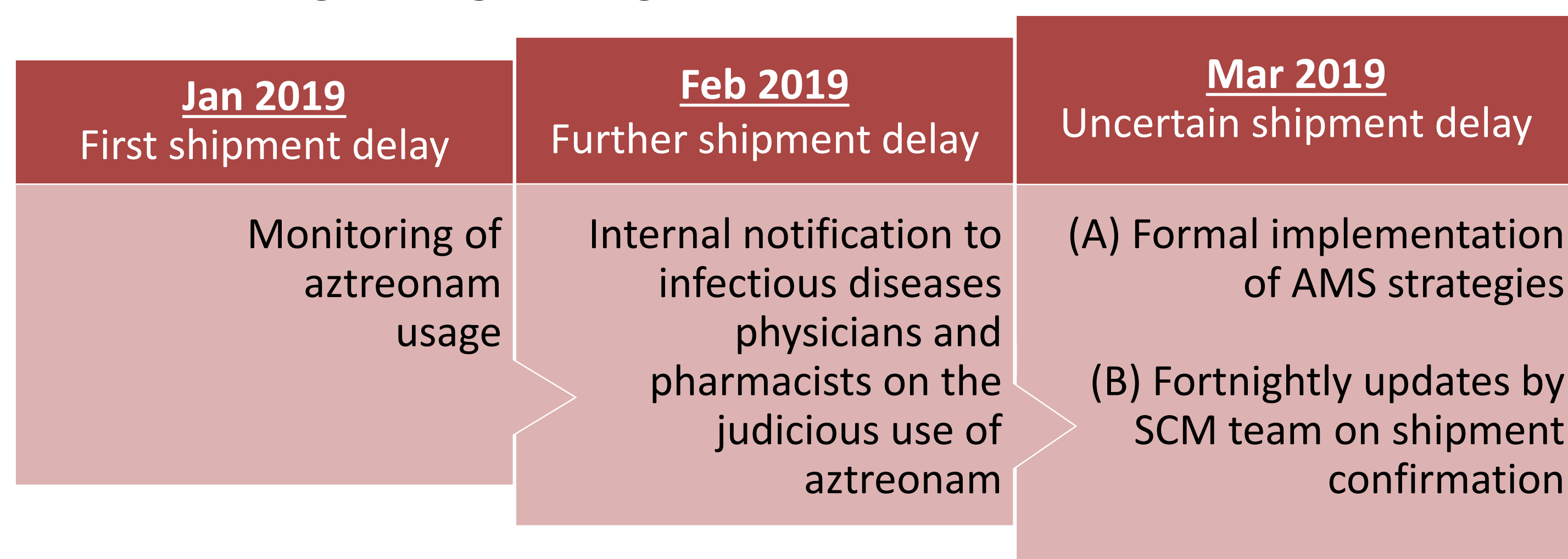
This study aim to illustrate the collaboration between the SCM team with a multidisciplinary clinical team in managing the shortage of aztreonam

## METHODS

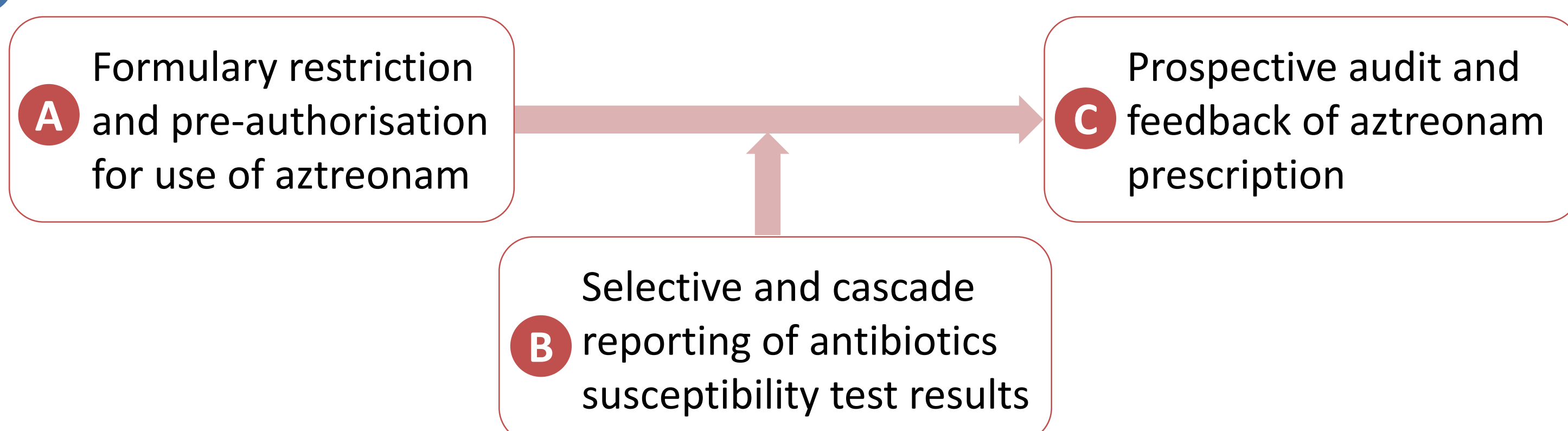
### 1 Inclusion Criteria

- Patients who were prescribed aztreonam between March and May 2019.

### 2 Timeline of drug shortage management



### 3 AMS Strategies Implemented<sup>4</sup>



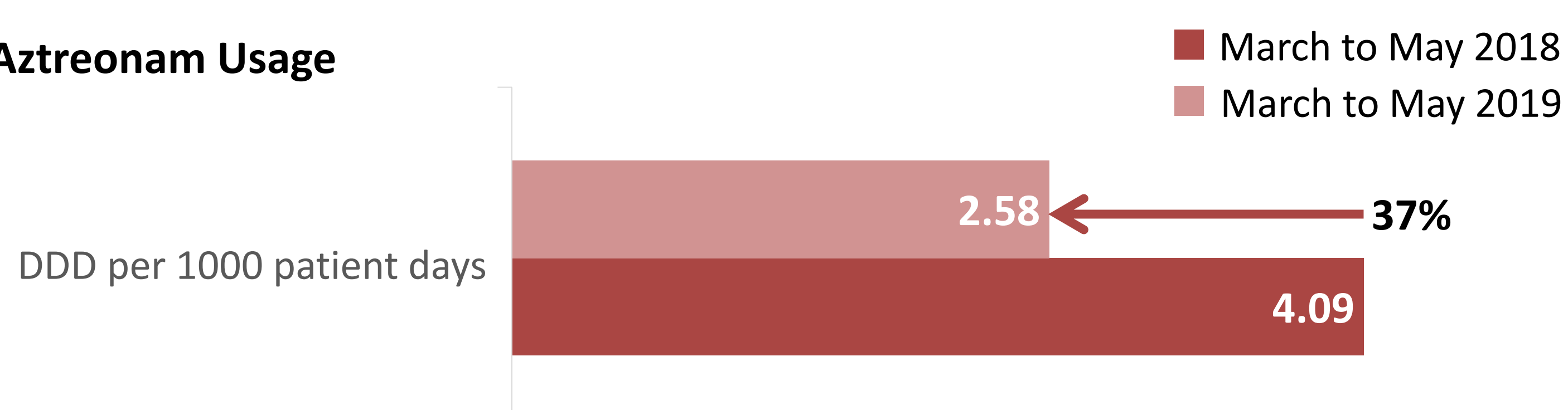
- Pharmacy and Therapeutics (P&T) committee implemented formulary restriction to restrict prescription of aztreonam to infectious diseases (ID) physicians only. Aztreonam prescription by other physicians will require pre-authorization by ID physicians prior to initiation.
- Microbiologist adopted a selective and cascade reporting of antibiotics susceptibility test results, specifically suppressing aztreonam unless no alternative was available.
- AMS team expanded the existing prospective audit and feedback of broad spectrum antimicrobials to include patients prescribed aztreonam for at least 24 hours. Appropriate recommendations, including drug challenge, discontinuation, switch to alternative antimicrobial, were made to primary care teams. The supply status of alternative antimicrobials were also confirmed with SCM team prior to recommendation.

### 4 Data Collection

- Aztreonam usage was extracted from the pharmacy dispensing system and reported as defined daily doses (DDD) per 1000 inpatient days.<sup>5</sup> We compared the aztreonam usage between March and May 2019 (when restriction was implemented), and the corresponding period in 2018.
- Clinical records were reviewed to evaluate: (1) compliance to ID pre-authorization (2) type of AMS recommendation (3) acceptance of AMS recommendation.

## RESULTS

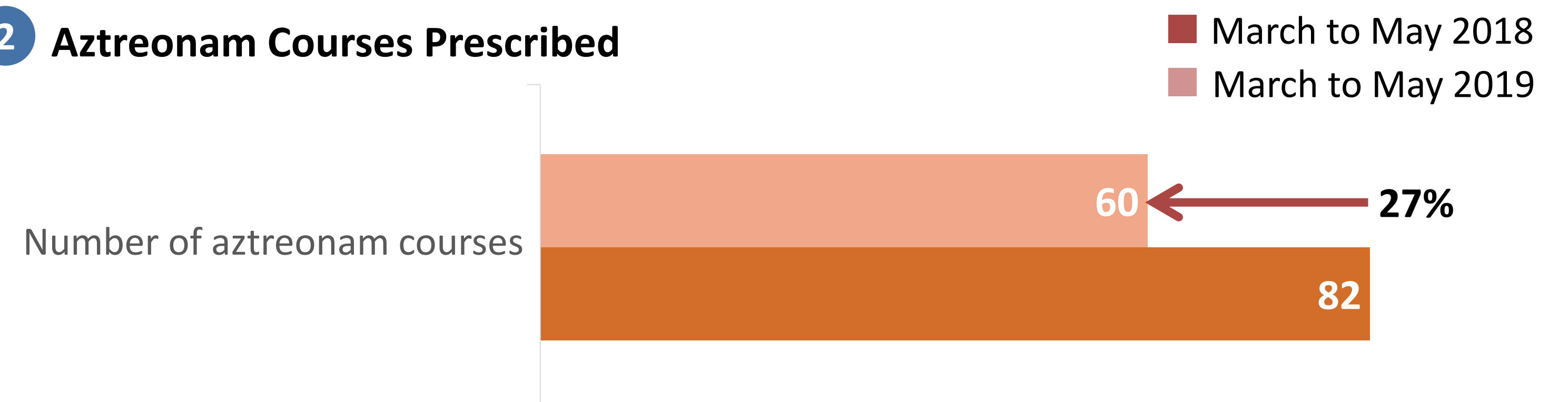
### 1 Aztreonam Usage



- The usage of aztreonam was stable in the period prior to March 2019.
- There was a 37% year-on-year decrease in aztreonam usage; 4.09 (March to May 2018) vs 2.58 (March to May 2019) DDD per 1000-inpatient days.

## RESULTS

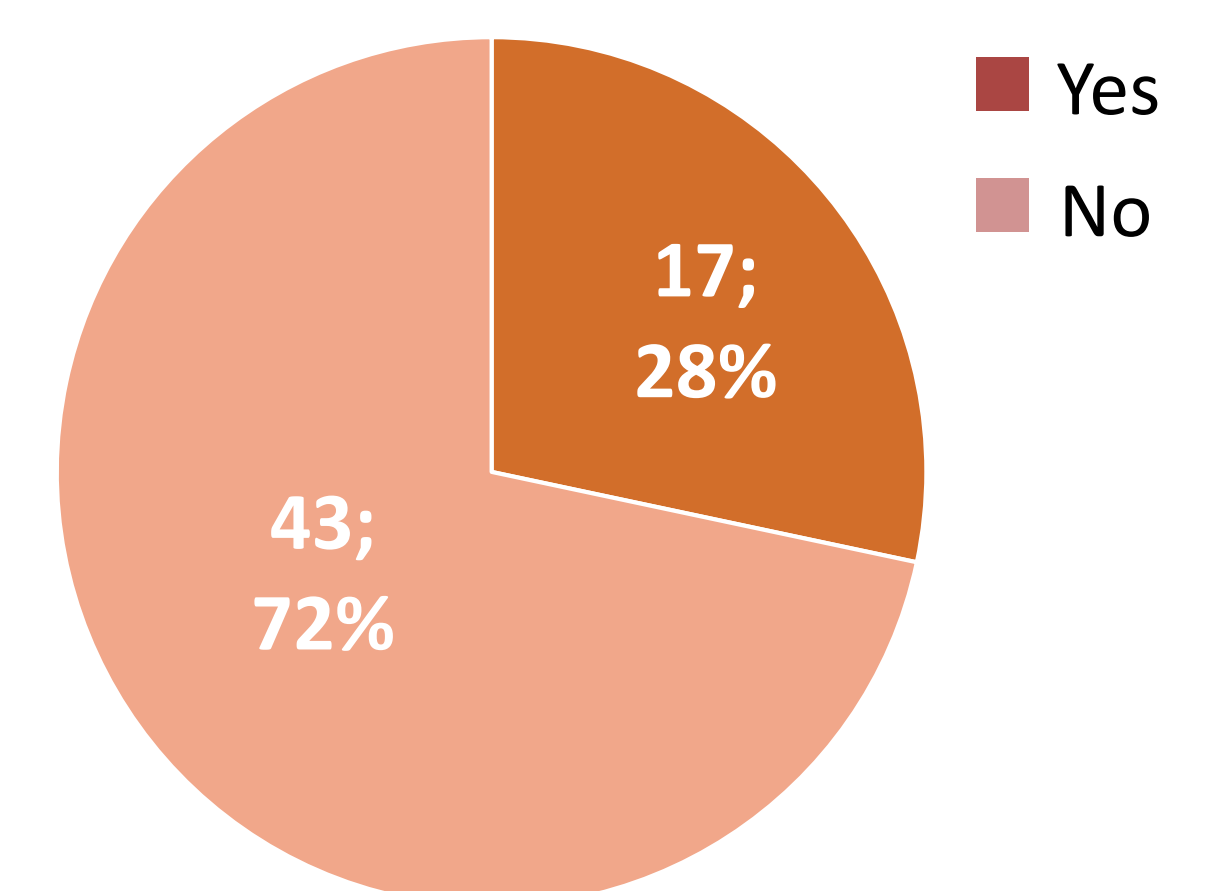
### 2 Aztreonam Courses Prescribed



- There was a corresponding drop of 27% in number of aztreonam courses from 82 (March to May 2018) to 60 (March to May 2019).

### 3 Compliance to ID Pre-authorization

- There was poor compliance to ID pre-authorization; only 28% of prescribers had documented compliance.

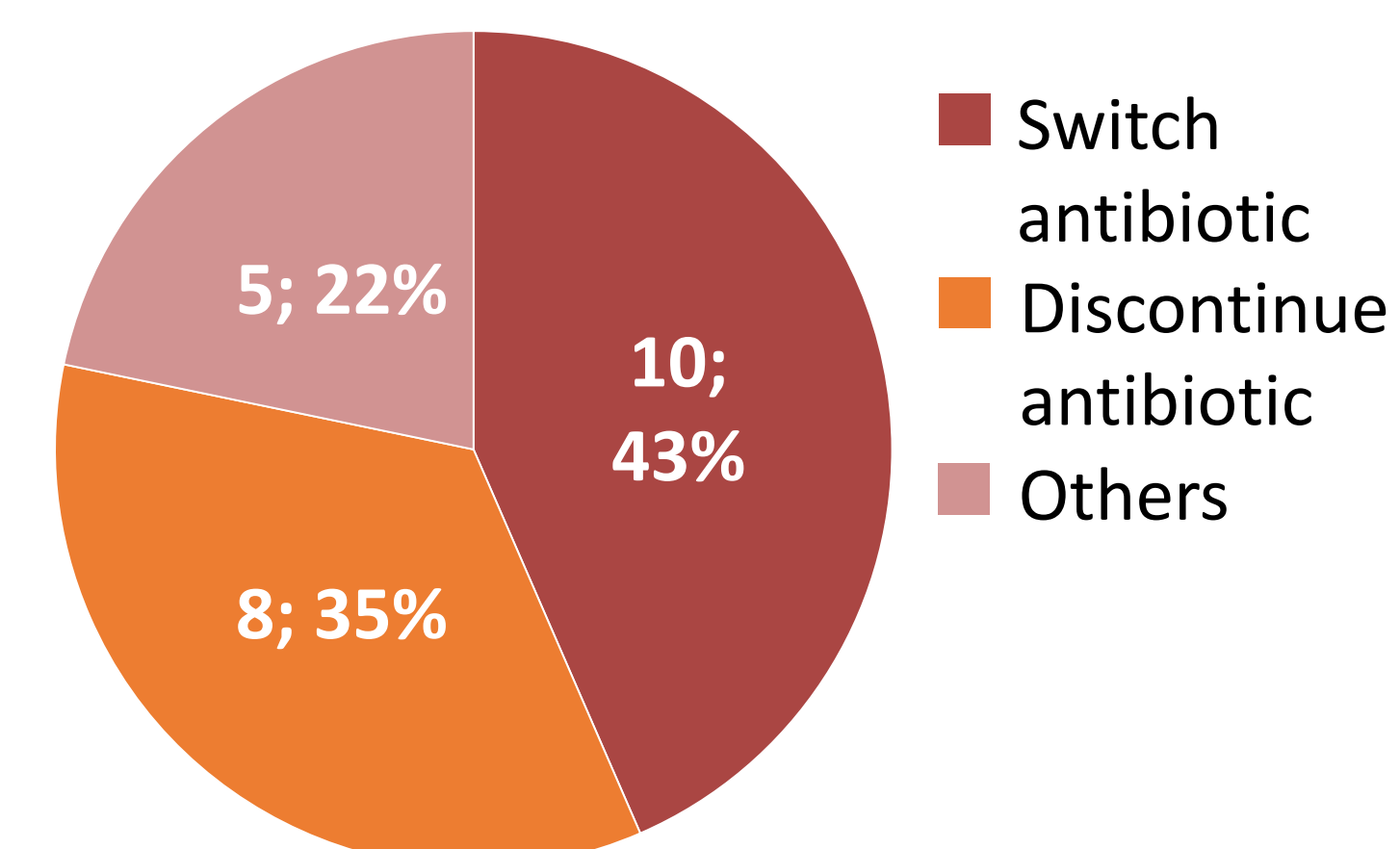


## PROSPECTIVE AUDIT AND FEEDBACK

- AMS team reviewed 41 courses (41/60, 68%).
- A total of 23 recommendations (23/41, 56%) were made.

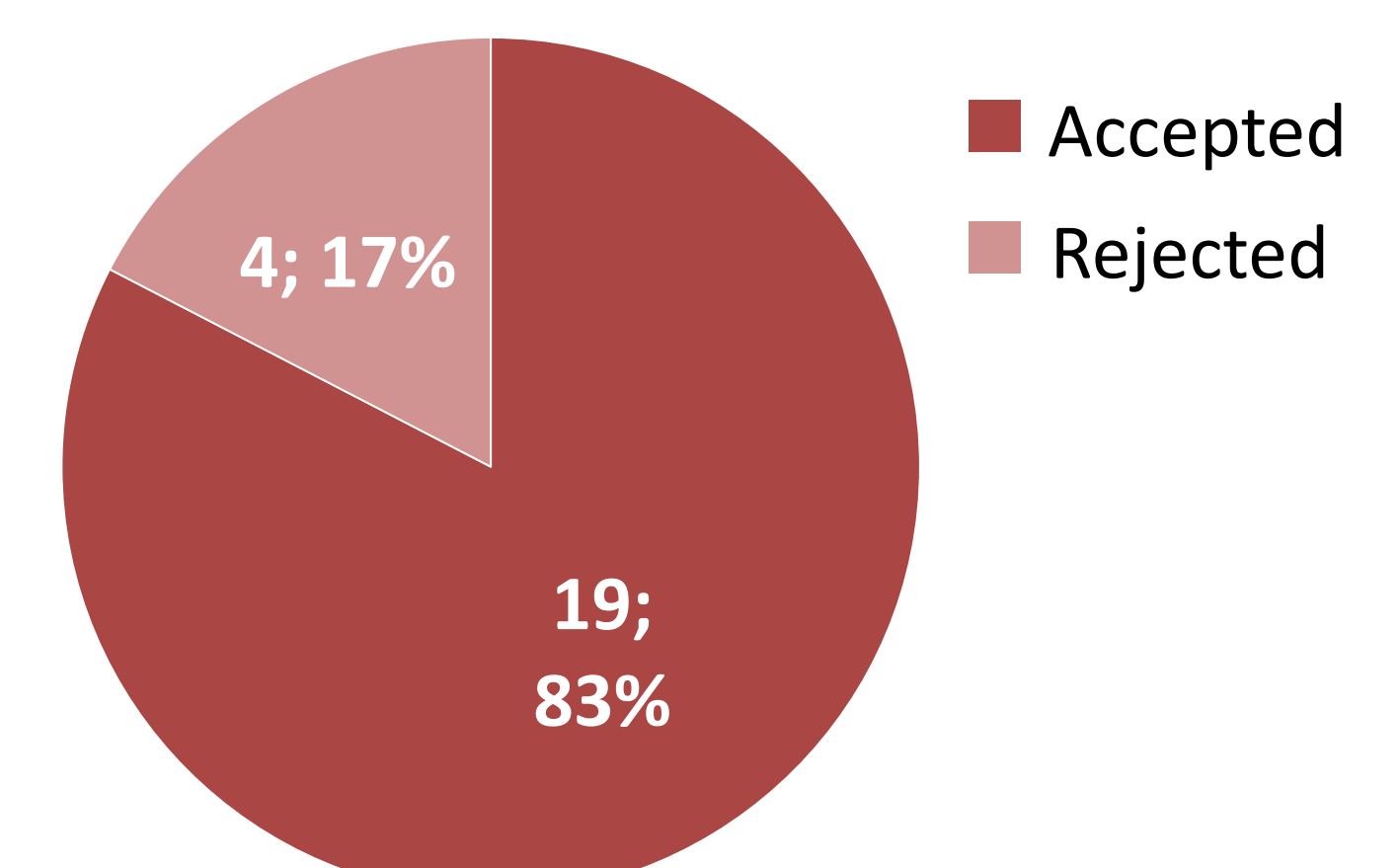
### 4 Type of Recommendation

- Majority of the recommendation made by AMS team was to switch aztreonam to another antibiotic (10/23, 43%). This includes broadening of antibiotic coverage, changing to alternative empirical or culture-directed antibiotic.
- We discontinued 8 courses of aztreonam (8/23, 35%) where there was no clear foci of infection.



### 5 Acceptance of AMS Recommendation

- Majority of the recommendations were accepted (83%).



## DISCUSSION

- Timely collaboration between SCM and AMS teams ensured effective management of drug shortage and prevented complete outage of aztreonam due to shipment delays.
- A single restrictive intervention strategy of may not be sufficient (e.g. formulary restriction and antibiotic pre-authorization), as seen with the poor compliance to pre-authorization.
- Additional measures involving prospective audit and feedback by AMS team as well as selective and cascade reporting of antibiotics susceptibility test results contributed to the effective management of aztreonam shortage.
- Furthermore, cost savings can be achieved by prescribing alternative antibiotics. For instance, changing aztreonam to oral levofloxacin could allow daily cost savings of more than S\$100.

## CONCLUSION

- A shortage in aztreonam supply was successfully managed through the combined use of various AMS strategies in close collaboration with SCM team. This process of multidisciplinary contributions can be adopted to manage future drug shortages.
- Future efforts can focus on education to improve appropriate prescribing of aztreonam.

## REFERENCES

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