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## Background

- Glycopeptide antibiotic- targets Gram positive organisms
- Can be administered orally or intravenously
- ORAL therapy is used for treatment of **Clostridium difficile**
- IV (focus of this audit) is used for systemic infections e.g. bacteraemia, penicillin allergic patients (second line)
- TDM** = Therapeutic Drug Monitoring- maintains efficacy and reduces/ monitors possible toxicities
- A loading dose (LD) is required to reach desired therapeutic range faster
- A maintenance dose (MD) is required to ensure therapeutic levels are maintained

## Objectives

**Prescribing:**  
-To determine if LD was prescribed every time IV vancomycin prescribed (Rx)  
-To determine if vancomycin chart and HEPMA prescribing times match

**Administration:**  
-To determine if vancomycin was administered within 2 hours of prescription time  
-To determine the frequency of delayed and missed doses  
- DELAYED : dose given after 2 hours of prescription time  
- MISSED : doses not administered (e.g. BD dosing 1 dose given= 1 missed dose)  
-To determine frequency of treatment doses in the early hours of the day

**Monitoring:**  
-To determine if first level was taken within 48hours of first dose  
-To quantify how often levels were taken( trough level/ pre dose)

**-95% target of compliance set as 'ideal standard' with senior pharmacists**

## Ideal standards

- Prescribing:**- online calculator should be used to determine the LD and MD, times prescribed on HEPMA and paper chart should match
- Administration:** dose should be given within 2 hours of prescribing
- Monitoring** :1st level taken within 48 hours & trough level should be taken pre-dose

## Method

- Retrospective audit
- Samples collected from 4 random wards – mix of surgical and medical
- 20 patients in total
- Between November 1st 2023- January 6th 2024
- Utilised clinical portal and labs

## Results

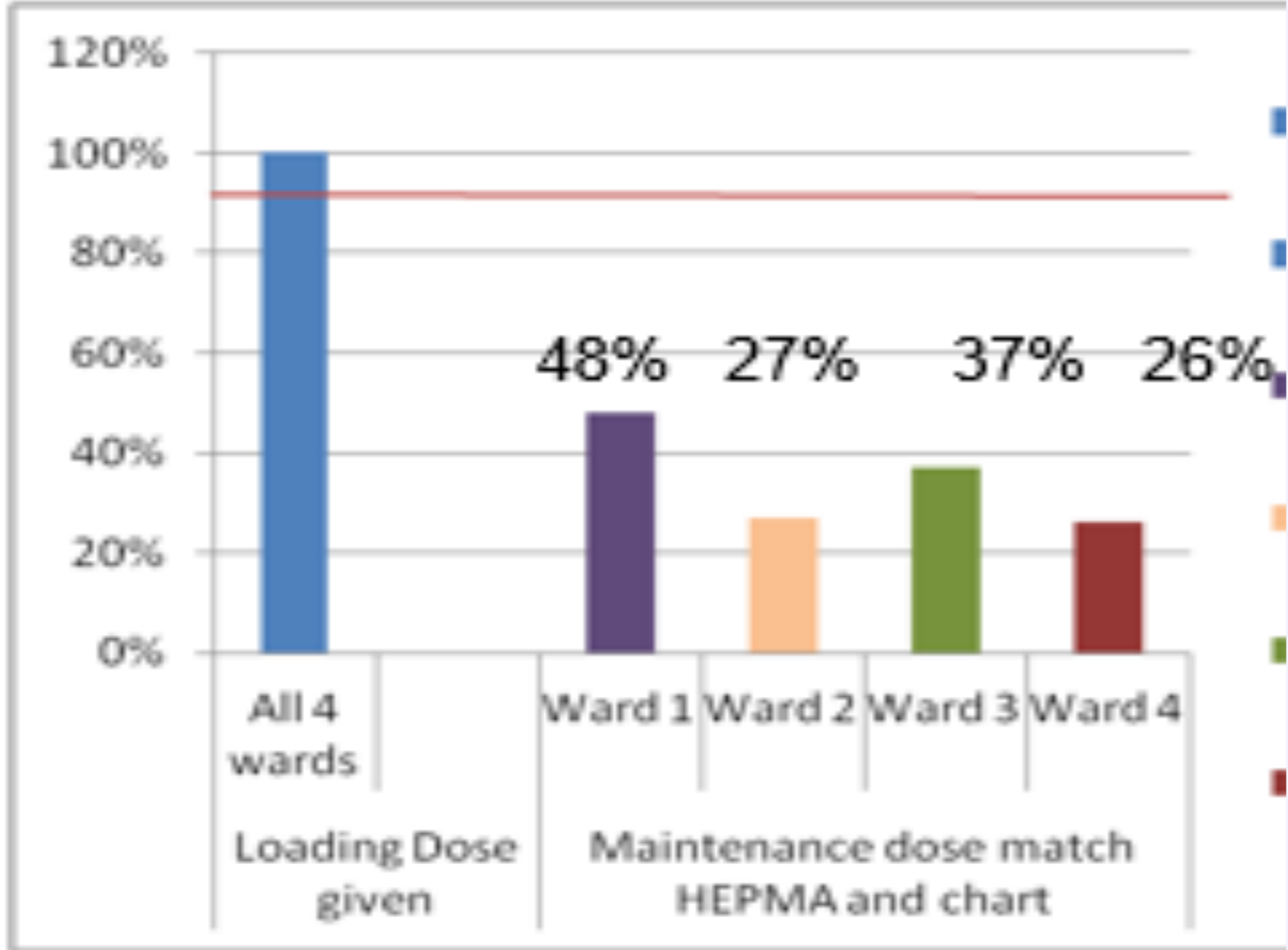


FIGURE 1: Prescribing- % of LD given and % MD doses match vancomycin chart and HEPMA

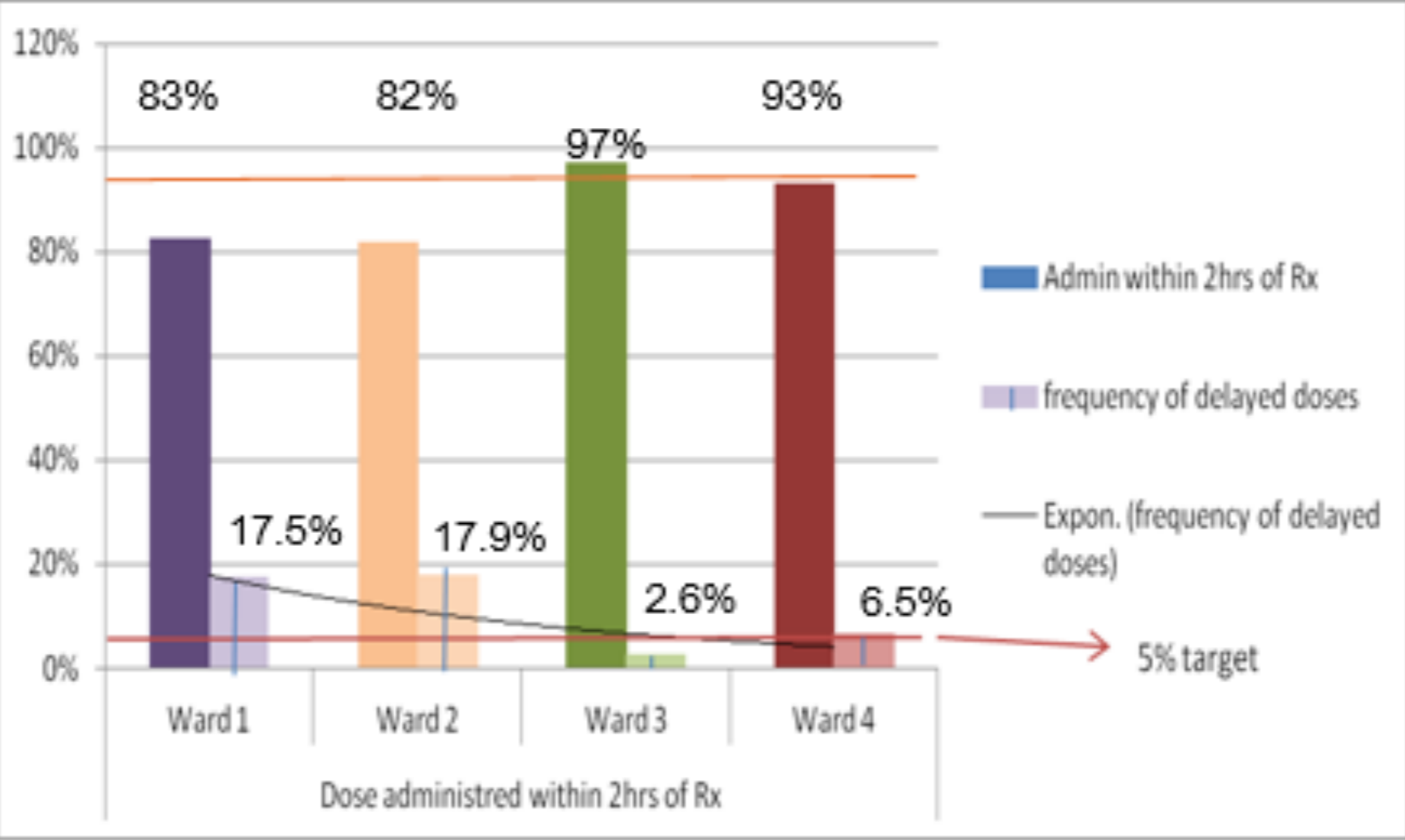


FIGURE 2: Administration-% of doses given within 2 hours of Rx time

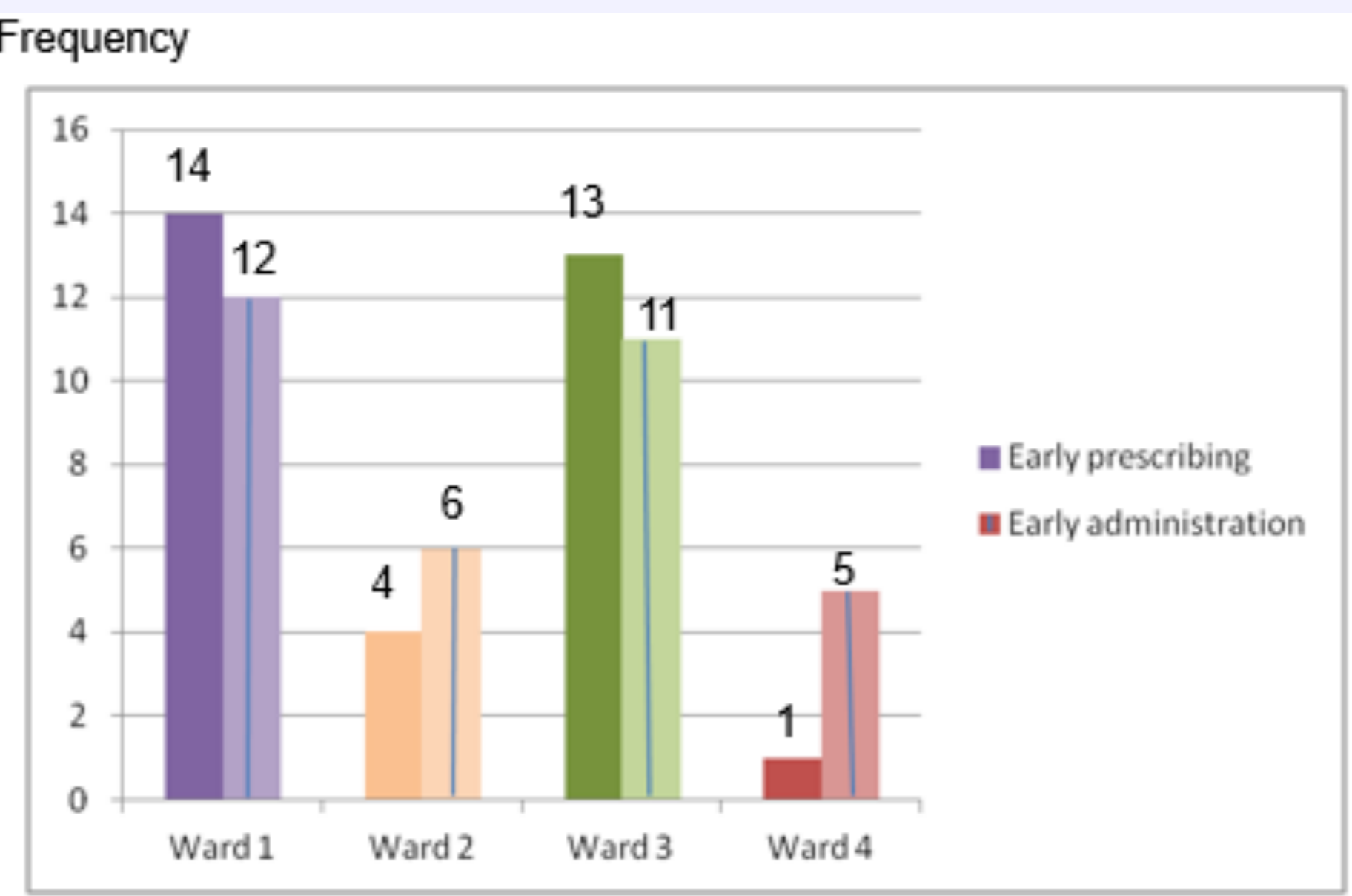


FIGURE 3: Frequency of Early Hour administration (1.00 - 5.59am)

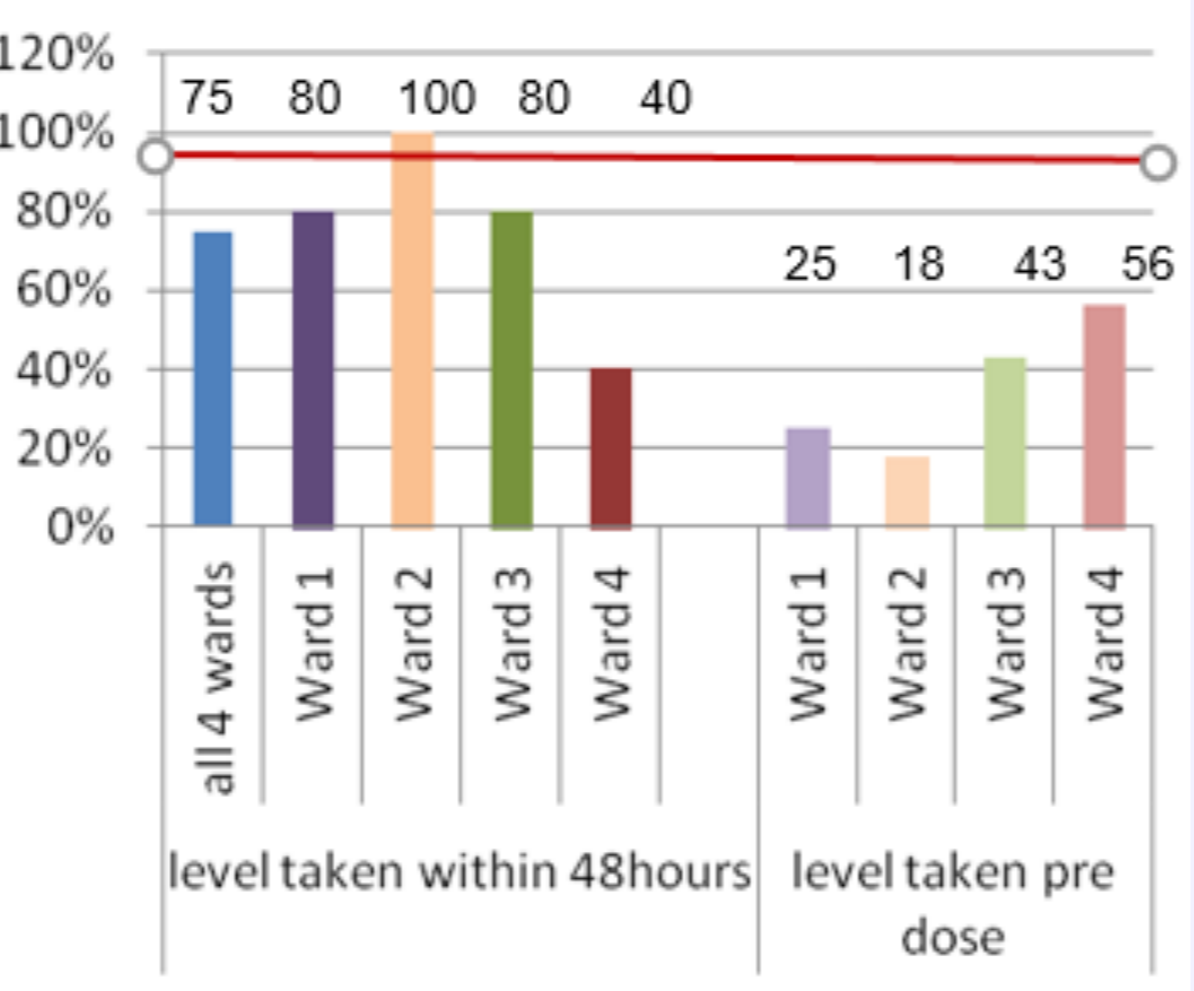


FIGURE 4: Monitoring- % levels taken in first 48hours & levels taken pre dose

**What should I do next?**

If dose of **ANTIBIOTIC** is overdue because of **unpreventable events**  
e.g. issued venflon, work pressures, higher priorities causing delay in drug rounds.

- Once the delaying factor has been resolved, administer the due dose as soon as able
- Do NOT delay the following dose unless it is due ≤4 hours (the only exception to this is 4-hourly dosing, in which case speak to a doctor or pharmacist)

Common examples:

Prescription on HEPMA	Issue	What should I do next?
Ceftriaxone at 8am and 12pm	12pm dose not given until 12 noon	Next dose due 8pm. Give as prescribed, do NOT delay it
Vancomycin at 10am and 12pm	10pm dose not given until 2am	Next dose due at 10am. Give as prescribed, do NOT delay it
Amoxicillin at 7am, 4pm and 12pm	7am dose not given until 12pm	Miss out 4pm dose, then continue as prescribed from 12pm
Mefenamic acid at 7am, 12noon, 10pm	12noon dose not given until 4pm	Next dose due at 10pm. Give as prescribed, do NOT delay it
1 paracetamol at 12noon, 4pm and 10pm	4pm dose not given until 11am	Check 12 noon's dose then continue as prescribed from 4pm

- Add a comment on HEPMA and document in medical notes reason(s) for the delay
- Consider adjusting HEPMA timings only if dosing intervals is not practical and ambiguous

FIGURE 5: QI intervention poster on delayed dose of antibiotics and appropriate action

## Discussion

**Prescribing:**

- LD- good awareness from prescribers and nurse on the need for a load vancomycin dose when first prescribed
- Reasons contributing to why prescription did not match HEPMA and chart: 2 prescribing system and prescribers often change the timings on vancomycin chart but forget to change on HEPMA

**Administration**

- Reason contributing to delayed, missed doses or early hours administration: workload, staff shortages, unintended situations (e.g. venflon issued), lack of communication between staff, fixated ideas on dosing intervals

**Monitoring:**

- Reasons levels not taken at the correct time: levels are taken by phlebotomist with heavy workload, lack of communication and lack of understanding e.g. poor awareness of when levels should be taken

**Limitation**

- Small sample size
- Time constraints
- Difficulty interpreting or extracting some of the data due to missing charts (not scanned onto file) and illegible handwriting on paper charts

## Conclusion

Results show: General practices are poor

- Practices vary between wards
- The 95% standard was met by in terms of:
  - loading dose being given (all 4 ward)
  - dose administered within 2 hours of Rx (on only 1 ward)
  - level taken within 48 hours of first dose (on only 1 ward)

Vancomycin intermittent infusion

- Gives rise to delayed doses
- Early prescribing and administration
- Difficult to monitor due to contributing factors from the MDT and patient factors

To improve practices:

- Education of staff is needed
- QI Intervention should be introduced on the wards

## Further work

To improve this audit further work may include:

- Statistical analysis of results with a robust sample size
- To determine the efficacy of vancomycin treatment on the presenting infection through testing and observation of infection and inflammatory markers (e.g. CRP, WCC, temperature)
- Education of doctors and nurses on the proper prescribing and administration of vancomycin surrounding delayed and missed doses
- Post audit to quantify the efficacy of the QI poster on vancomycin practices