

“Why is My Antibiotic Not Working?”

Concomitant Prescriptions of Multivalent Cation with Oral Quinolones or Tetracyclines.



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Background

- The risk of antibiotic treatment failure due to the interaction between oral quinolones or tetracyclines with multivalent cation-containing products is well documented.
- These products, such as supplements and antacids, have significant amounts of either iron, calcium, magnesium and others, which may sequester and reduce the absorption of oral antibiotic when taken concomitantly.
- In the case of doxycycline, serum levels have been reported to decrease by up to 100% as a result of this interaction, while ciprofloxacin plasma levels are reduced by up to 50%.^[1]

Aims

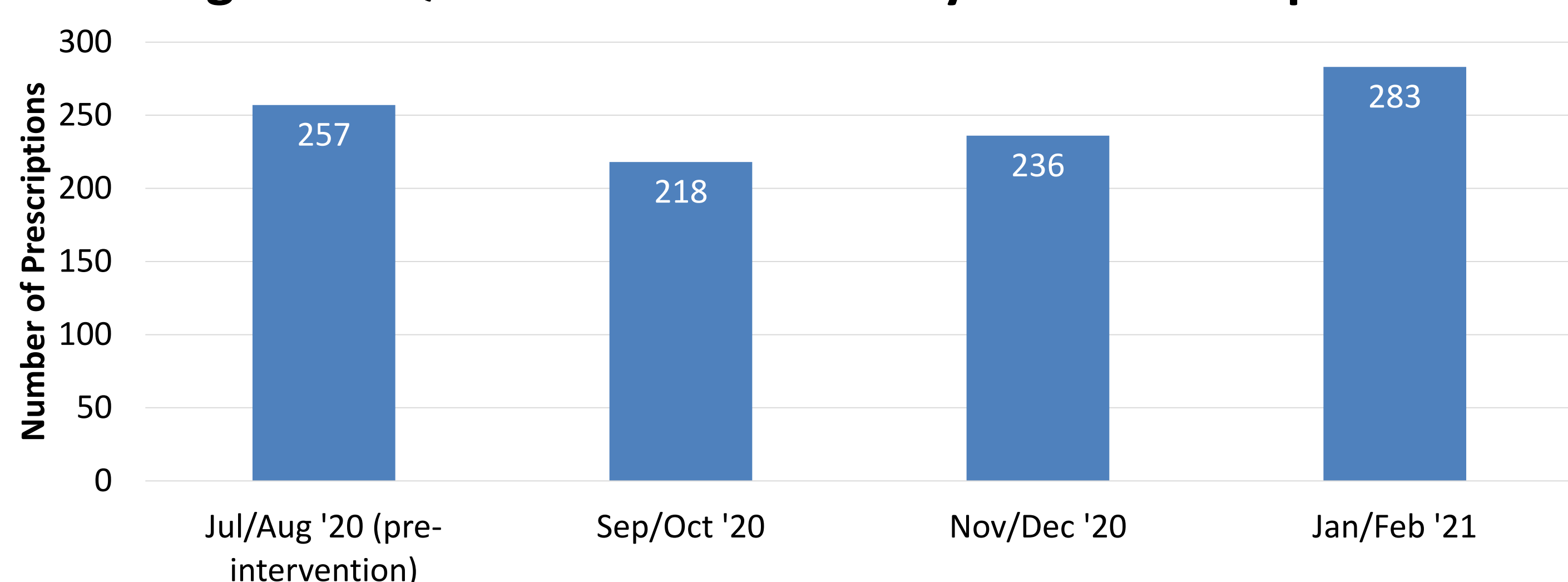
- Identify the frequency of concomitant prescription of multivalent cation-containing products with oral quinolones or tetracyclines.
- Identify the number of these prescriptions that were suspended or avoided during the period of antibiotic administration.
- Apply various interventions to reduce these concomitant prescriptions.

Method

- Inpatient prescribing data for Dumfries and Galloway between July 2020 and February 2021 was extracted from the prescribing application HEPMA and audited retrospectively.
- All patients prescribed oral quinolones or tetracyclines were included to determine how many concomitant prescriptions containing multivalent cation were suspended or modified during the period of antibiotic administration.
- Interventions were then applied to reduce these concomitant prescriptions.

Results

Figure 1: Quinolones and Tetracyclines Prescription



- Quinolones and tetracyclines were prescribed 994 times in a cohort of 363 patients between July 2020 and February 2021.
- Of these 994 prescriptions, 321 had been concomitantly prescribed with various multivalent cation-containing products (Figure 1 and Figure 2).
- Pre-intervention, up to 93.2% of these concomitant prescriptions went unnoticed. Following interventions, these rates have been reduced to 56.3% (Figure 3).

Figure 2: Types of Multivalent Cation Concomitantly Prescribed

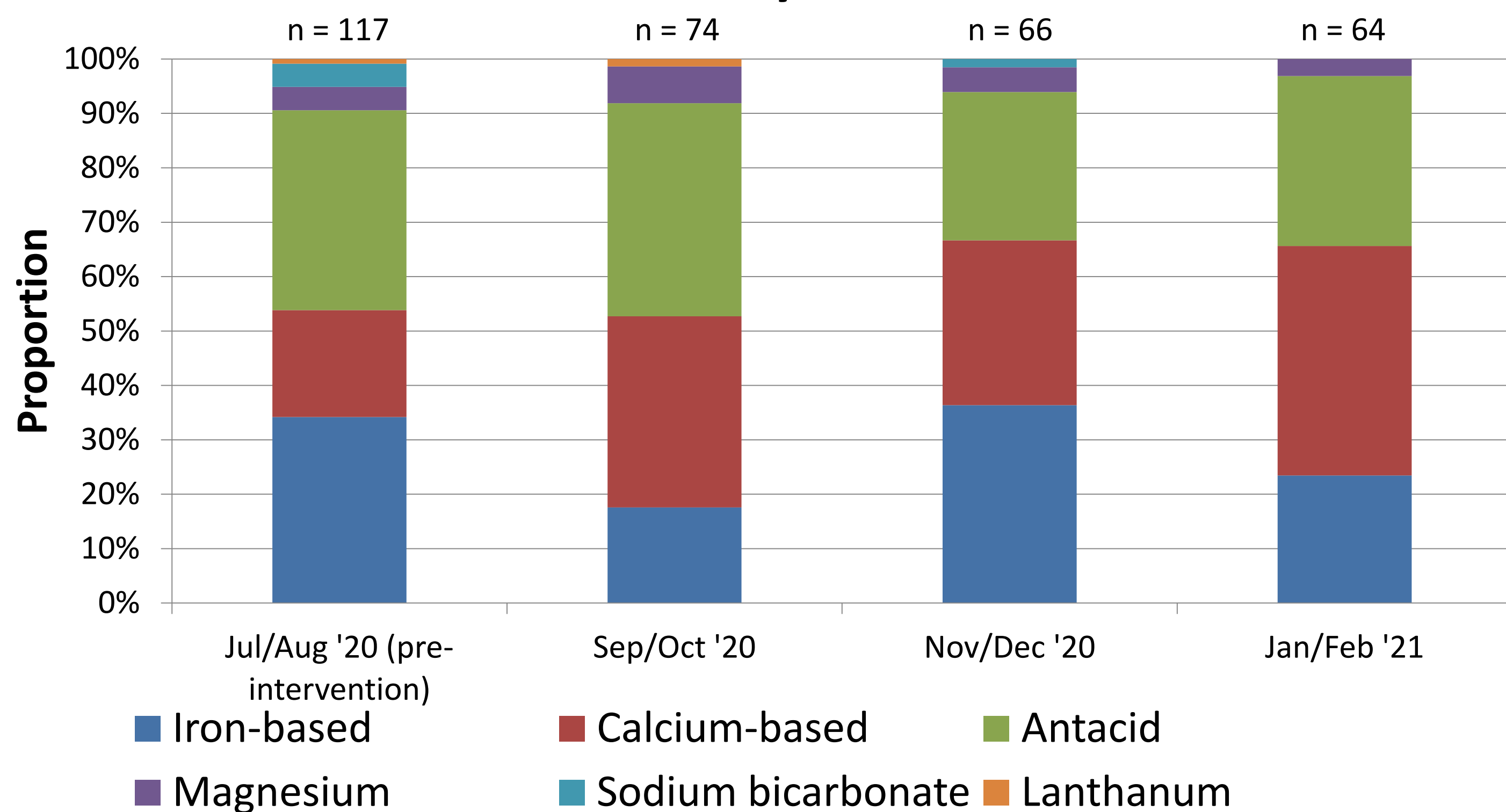
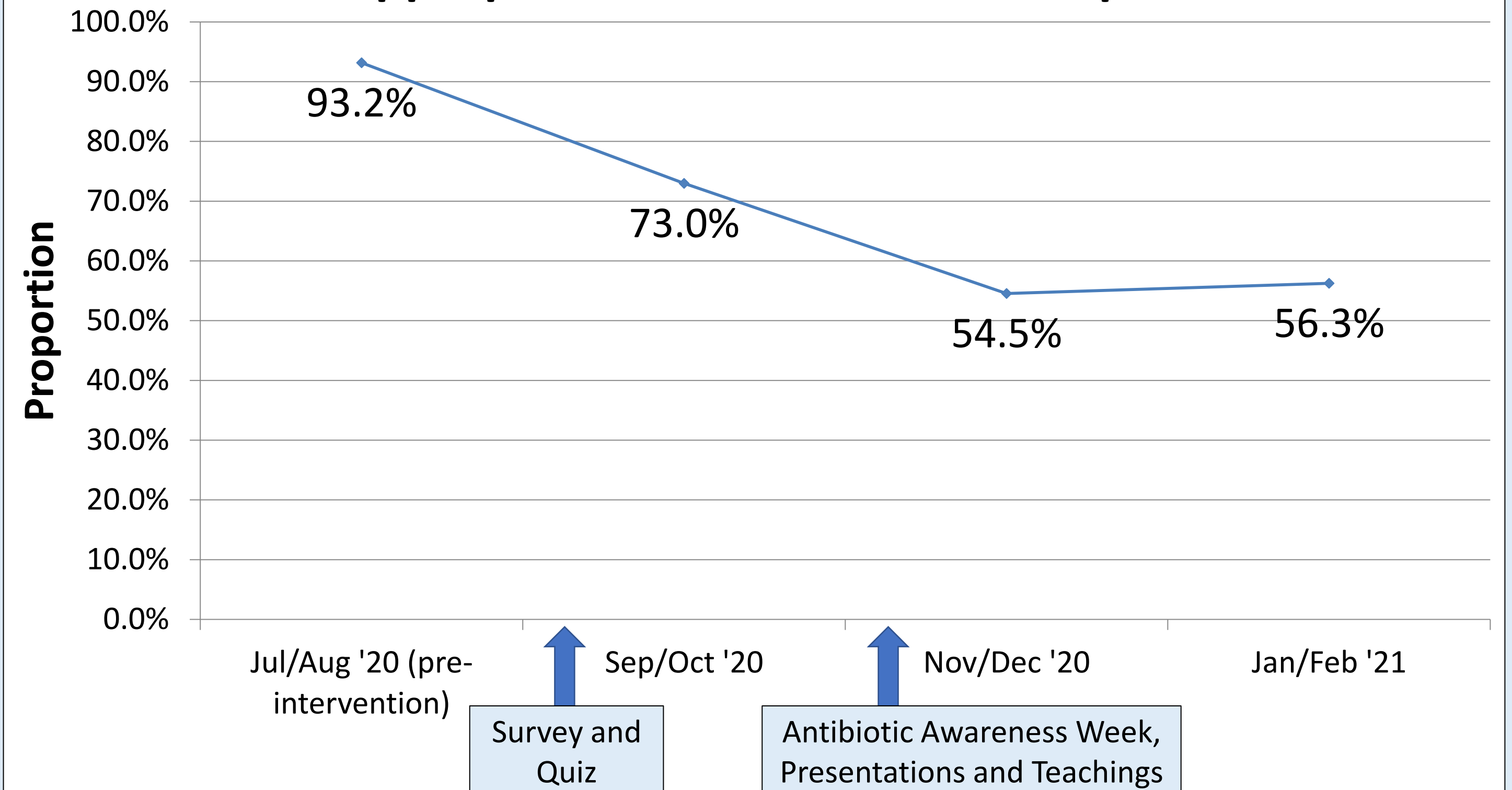


Figure 3: Proportion of Oral Antibiotics with Inappropriate Concomitant Prescriptions



Discussion

- Most of these antibiotic interactions went unnoticed due to a lack of awareness, reminder or prompting among prescribers.
- Notably, there were 994 antibiotic prescriptions among 363 patients which may suggest repeated antibiotic courses possibly due to ineffective treatment or antibiotic resistance.
- Notably also, this data does not include community prescriptions, or non-prescription multivalent cation such as in supplements and milk-based diet, which may affect the data.

Conclusion

- Interactions of multivalent cation-containing products and oral antibiotics could potentially cause antibiotic treatment failure, unnecessary antibiotic escalation and antibiotic resistance, which may lead to significant health care burden.
- Despite improvements as shown in the data, more effort is required to further reduce interaction rates and ensure sustainability by raising awareness and improving antimicrobial stewardship.

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References

1. <https://ggcmedicines.org.uk/blog/warning-antibiotic-treatment-failure-risk/>

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