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How data visualisation using historical medical journals can contribute to current debates around antibiotic use and antimicrobial resistance in primary care

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Background and aim

The early years of antibiotic use in primary care (c1950-1959) has received little attention. Medical journals, such as the British Journal of General Practice (BJGP) provide a rich source for studying historic healthcare practitioners' views and interests. Understanding their attitudes about antibiotic use has the potential to inform contemporary debate around issues of overuse and antimicrobial resistance.

This pilot study tests the application of digital methods to interrogate historical medical journal data in relation to antibiotic use.

Methods

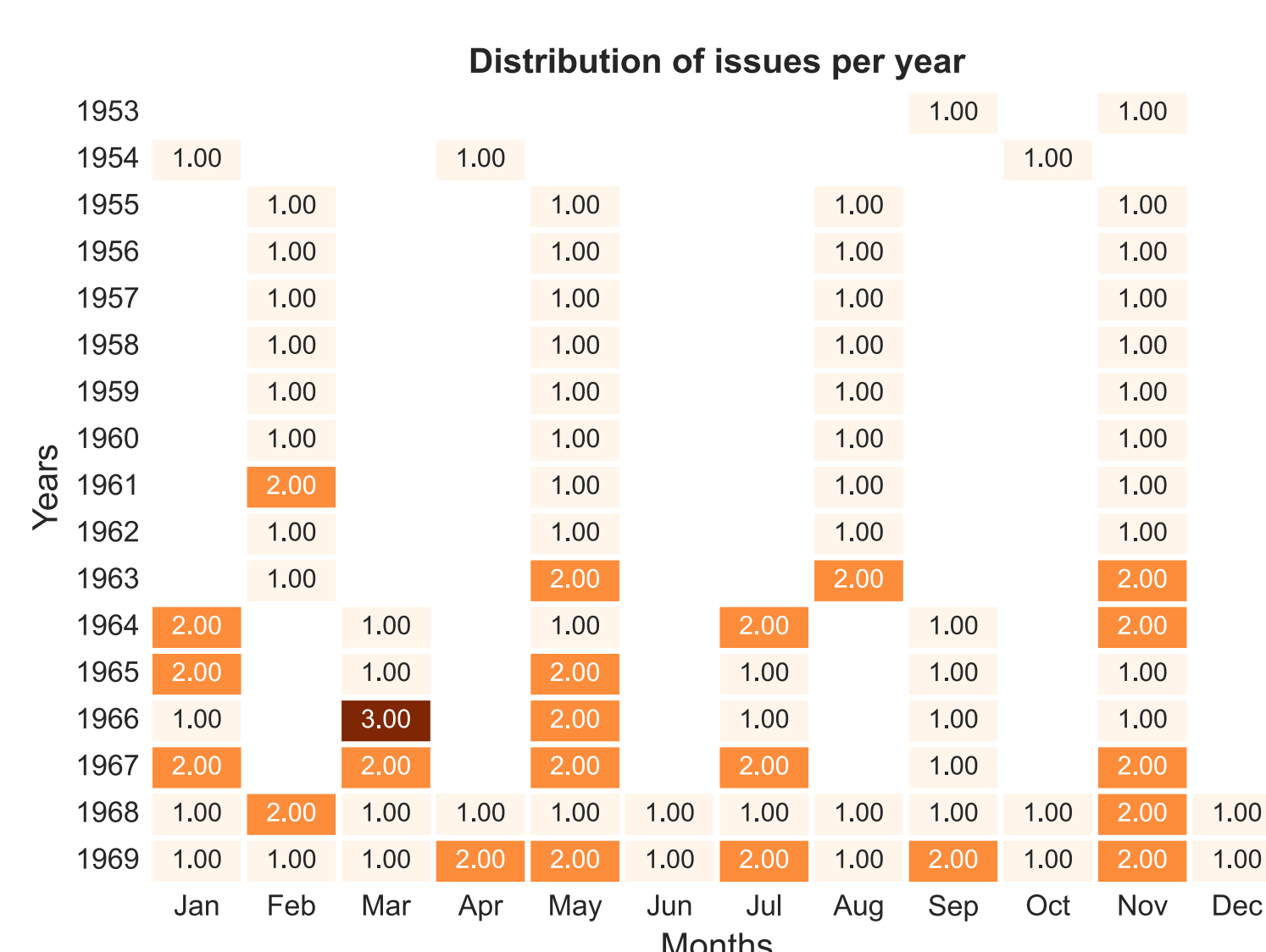
Meta-data and scanned articles were extracted from the online British Journal of General Practice (BJGP) archive from inception (1953) to 1969. Searchable text was generated using an application called ABBYY optical character recognition, and Python used to generate data visualisations exploring:

- 1) How BJGP changed during the period
- 2) Mentions of terms 'antibiotic(s)', 'penicillin', 'resistance/resistant' and mapping when and where they occurred

Results 1

Changes to the BJGP 1953-1969

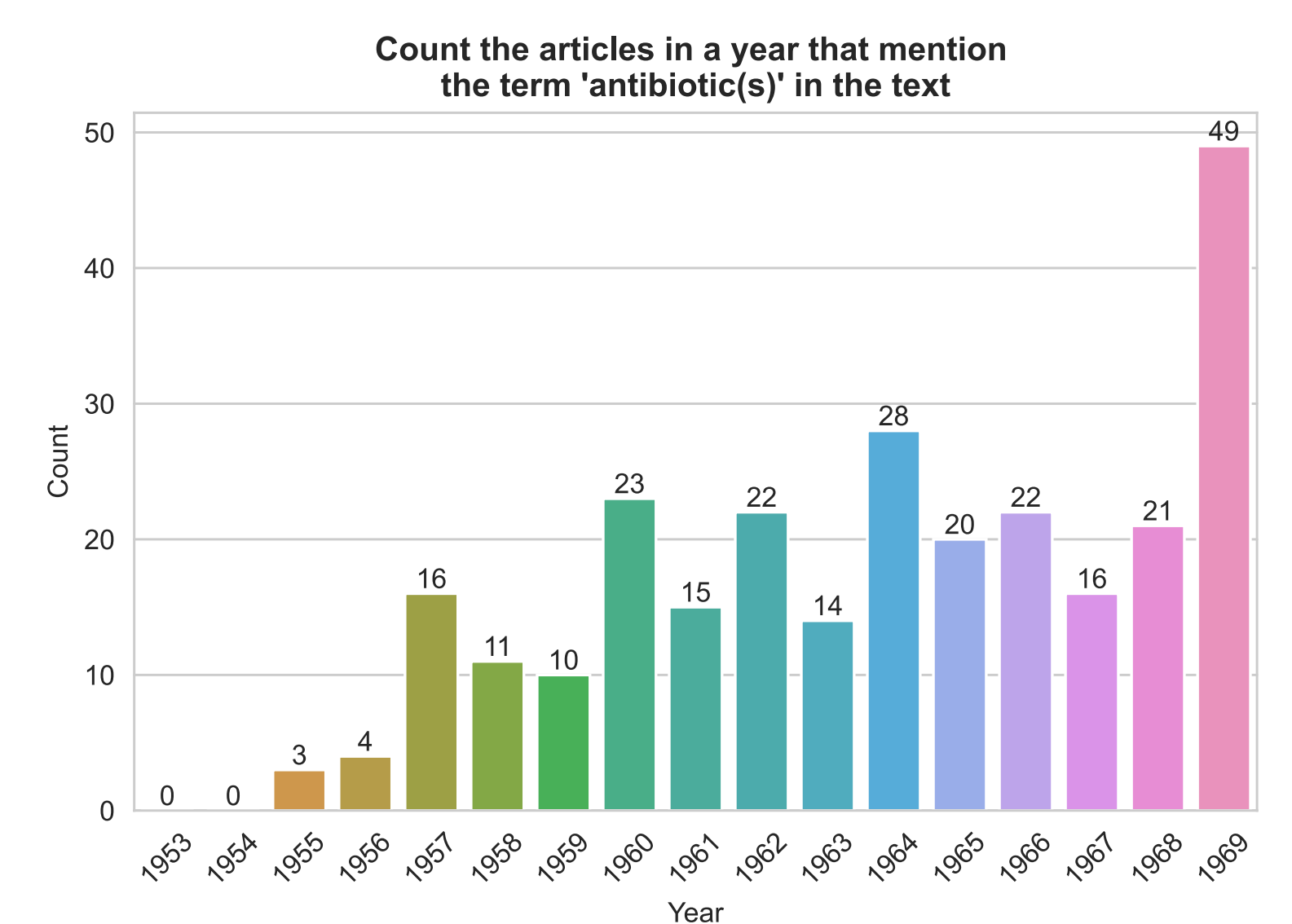
- Number of annual issues increased 2 to 17
- Number of annual pages increased <25 to >1100
- Frequency of editions from ad hoc, to quarterly, to a minimum of once a month



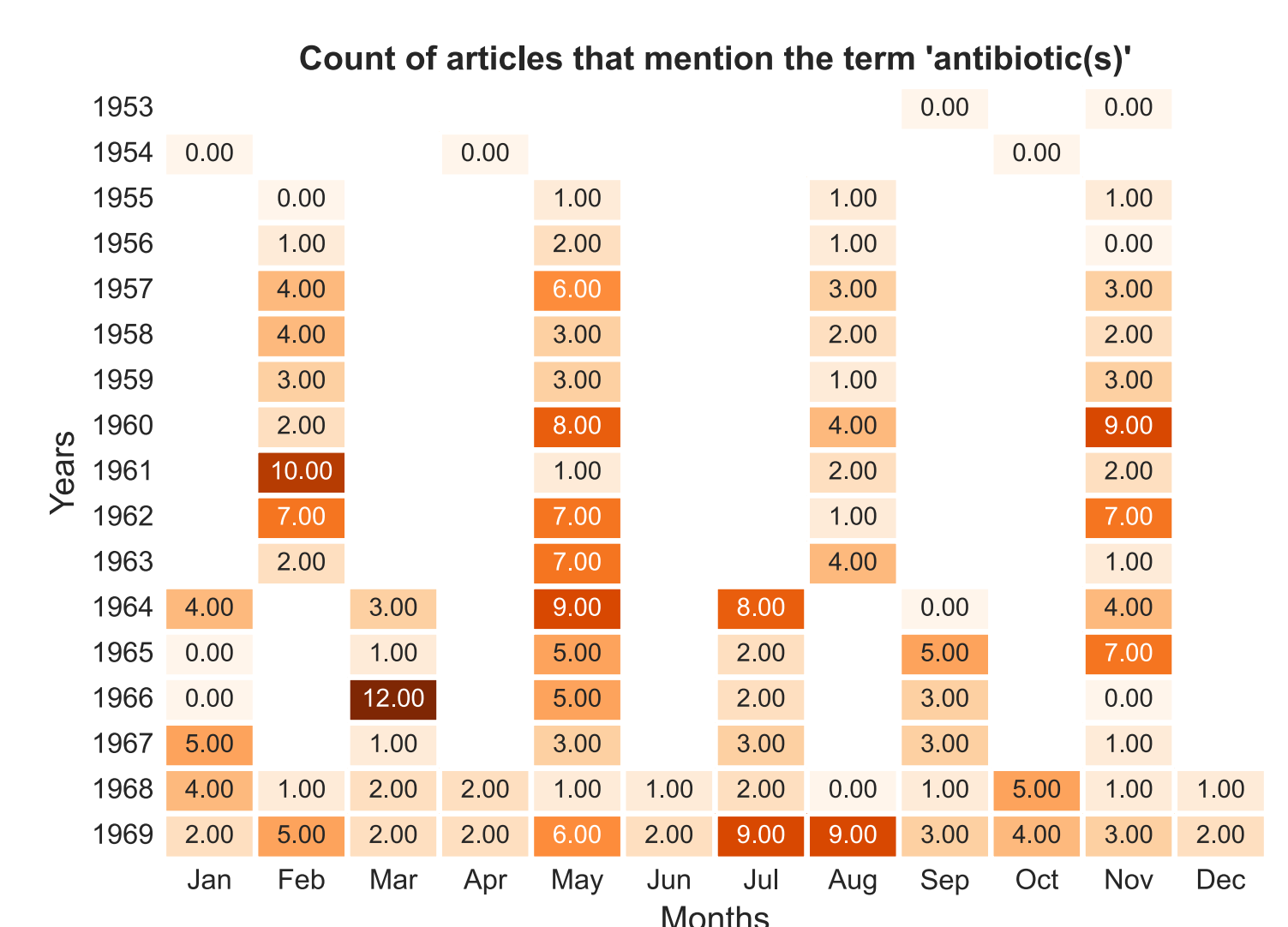
Results 2

Mentions of Antibiotics in the BJGP 1953-1969

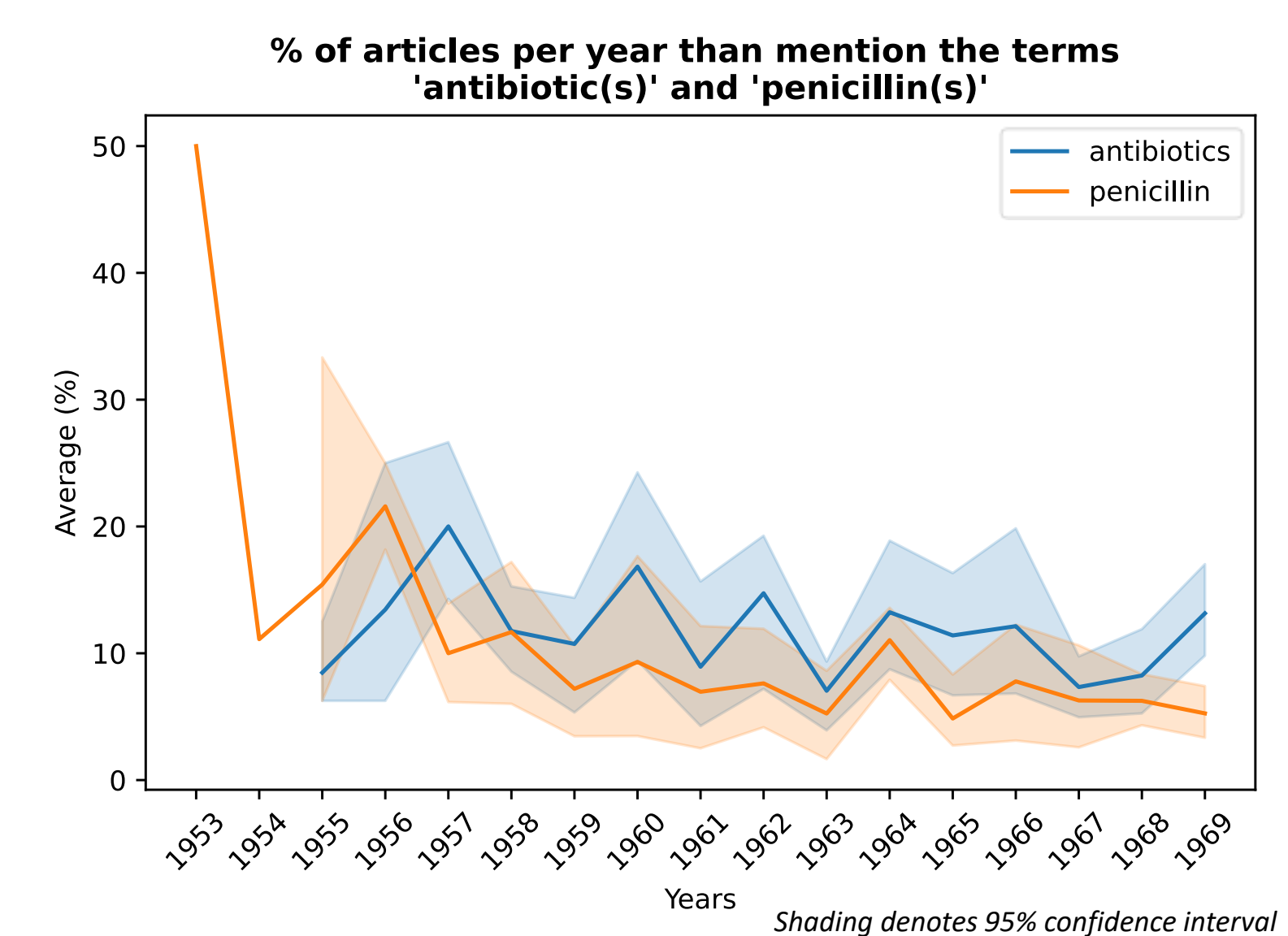
- The number of articles mentioning the term 'antibiotic(s)' each year increased fairly steadily from 0 (1953) to 49 (1969)



- Although articles mentioning the term 'antibiotic(s)' occurred in most issues, there is large variation, with some evidence of clustering in issues, particularly in the 1960s



- In general, mentions of the term 'antibiotic(s)' were generally constant around 10% to 20% of articles
- The term 'penicillin' generally occurred in around 5% to 10% of articles



- Bigram searches found 'treatment' and 'therapy' to be the two most common terms that appeared with 'antibiotic(s)'
- The fourth and seventh most common terms were 'resistant' (first appearance 1955) and 'resistance' (1962)

Conclusion

This pilot work shows that primary care publications increased considerably between 1953-1969. Articles on antibiotics featured frequently in relation to therapeutic intervention, and concerns around resistance occurred at an early stage. Future work will identify other antibiotics in use during this period, and employ analyses to investigate the content of articles. This approach provides new insights into how attitudes and behaviours around antibiotic use by primary care have evolved over time. It may also have the potential to inform study of the future use of antibiotics in primary care.

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