IV antibiotics in **hospital settings** can be used with caution to represent **national parenteral AWaRe antibiotic procurement rate**; and 95% of national **oral Access and Watch antibiotic** can be assumed with caution as being used in primary care settings

Using routes of AWaRe antibiotic administration in different data sources to estimate national procurement rates across different settings

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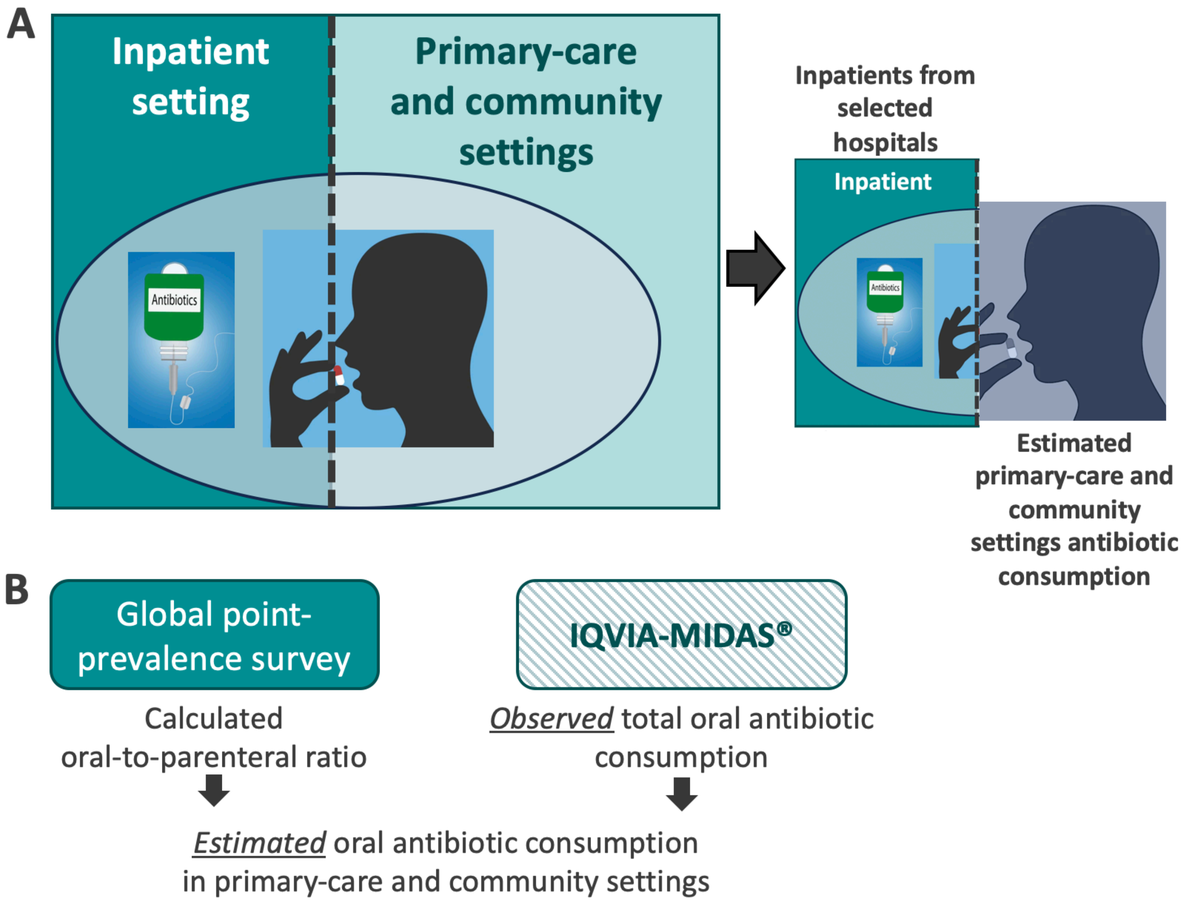
Background: Benchmarking antibiotic use across hospital and primary care settings is important to inform quality improvement and target development. However, national level prospective antibiotic data collection from those sectors is complex and not feasible in resource-limited settings. This study aims to explore the feasibility of using existing existing data on hospital antibiotic to estimate national AWaRe antibiotic consumption rates in primary care settings.

Figure 1. A conceptual diagram of estimating oral antibiotic consumption in primary care settings (A) and data flow (B).



O = national oral antibiotic use (observed)
$O_{primary\ care}$ = national oral antibiotic use in primary care settings (unobserved)
P_{total} = national parenteral antibiotic use (observed)
P_H = parenteral antibiotic use among inpatients in sampled hospitals (observed)
O_H = oral antibiotic use among inpatients in sampled hospitals (observed)
O_H/P_H = hospital oral/parenteral ratio (calculated)
Hence: $O_{primary\ care} = O - [(O_H/P_H) * P_{total}]$

Methods: We compared antibiotic consumption patterns using IQVIA-MIDAS® Quarterly Sales Database ("IQVIA-MIDAS"; platform integrating IQVIA's national audits of retail and non-retail channels) and Global Point Prevalence Survey (Global-PPS) inpatient data from selected hospitals in eight countries in 2019. Antibiotic consumption was measured using defined daily doses (DDD) per 1,000 inhabitants per day (DID), and DDD per 1,000 surveyed adult inpatients on the day of survey. The analysis focused on Access and Watch antibiotics. The observed ratio of oral-to-parenteral antibiotics in the Global-PPS inpatient dataset was determined for each country. Subsequently, this ratio was applied to the IQVIA-MIDAS data to estimate oral antibiotic consumption in the primary care settings, assuming all parenteral antibiotics were only used among inpatients.

Results: Total antibiotic consumption in 2019 across the eight selected countries was 5.4 billion DDDs (114 DIDs) in the IQVIA-MIDAS data. The Global-PPS study reported 33,121 DDDs (8,861 DDD per 1,000 surveyed adult inpatients). The ratio of oral-to-parenteral antibiotic consumption among inpatients in the Global-PPS was consistent across European countries. After applying the ratio to IQVIA-MIDAS data, estimates indicated that less than 5.5% of the country-level oral antibiotics were used by inpatients. This aligns with the expectation that the great majority of oral antibiotics from the Access and Watch groups are used within the primary care settings.

Figure 2. Ratio of oral to parenteral antibiotic consumption for Access and Watch antibiotic groups among hospitalised patients reported in the Global-PPS 2019 study data in the eight countries. The point estimates of the ratios from the Global-PPS data are subsequently used to estimate nationwide oral antibiotic consumption in primary care settings, assuming all parenteral antibiotics were only used among inpatients.

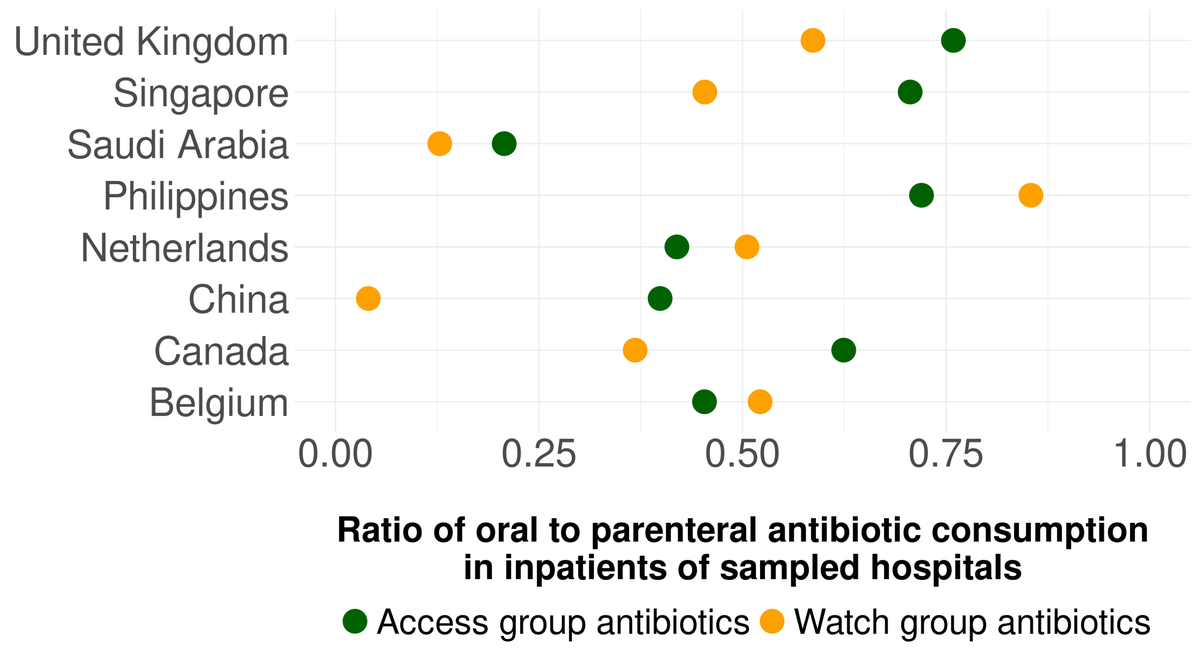
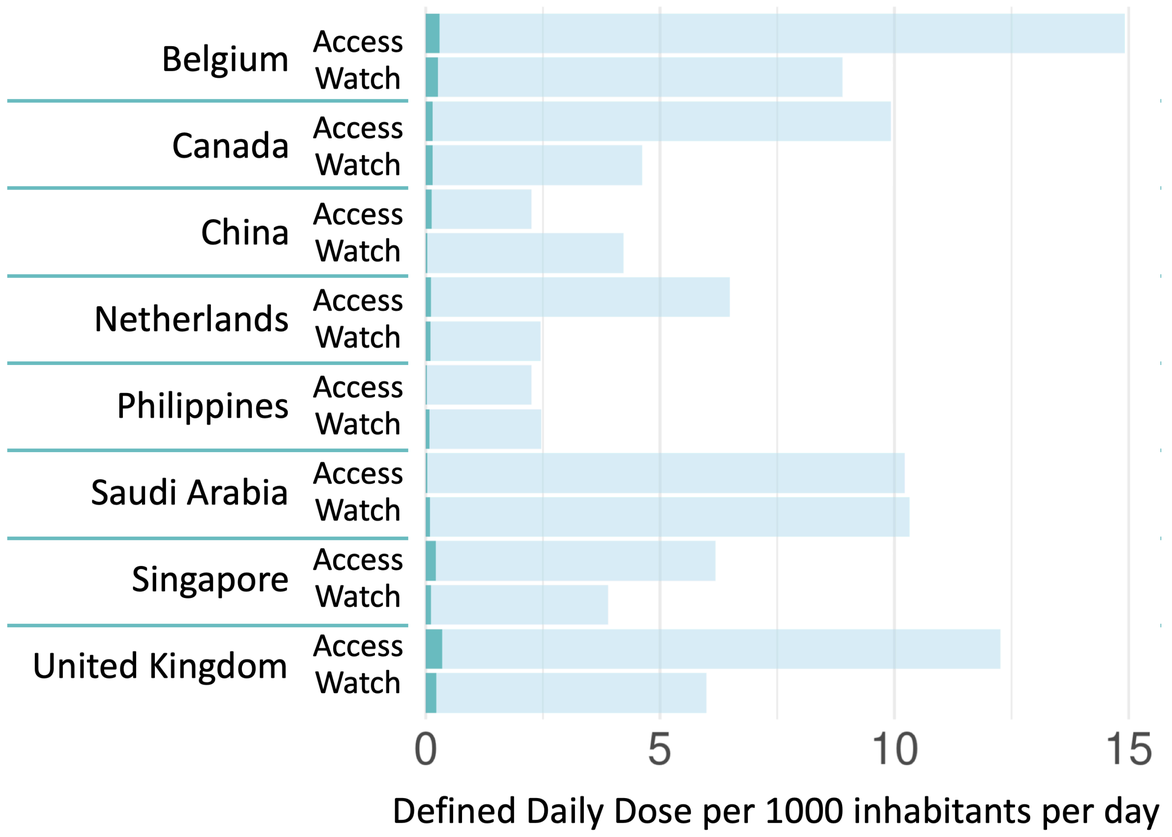


Figure 3. Oral *Access* and *Watch* antibiotic consumption in 2019 by country. The pale blue bars represents the *estimated* consumption in the primary care settings. The dark cyan bar represents the *estimated* consumption in the inpatient population. The total length of the bar is the total *observed* oral antibiotic consumption in IQVIA-MIDAS 2019 data.



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