

8 February 2019

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## The Atlas of Healthcare Variation | Community Antibiotic Use Domain

Dear Catherine

Thank you for inviting the New Zealand Medical Association (NZMA) to provide feedback on the draft community antibiotic use domain of the Atlas of Healthcare Variation. The NZMA is New Zealand's largest medical organisation, with more than 5,000 members from all areas of medicine. The NZMA aims to provide leadership of the medical profession, and to promote professional unity and values, and the health of all New Zealanders. Our response has been informed by feedback from our Advisory Councils and Board.

1. The NZMA recognises the serious threat posed by antimicrobial resistance and welcomes appropriate initiatives to address this. We have previously submitted on the New Zealand Antimicrobial Resistance Action Plan<sup>1</sup> and endorsed the New Zealand College of Public Health Position Statement on Antimicrobial Stewardship and Infection Control.<sup>2</sup>
2. We note that the stated purpose of the domain on community antibiotic use is to “highlight regional and demographic variations in order to stimulate debate and conversation and highlight areas for further investigation”. While this domain may indeed stimulate such debate, our view is that several limitations make it inappropriate to use the data presented in this domain as a quality marker or indicator for the appropriateness of prescribing. From the commentary

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<sup>1</sup> NZMA Submission on Draft New Zealand Antimicrobial Action Plan. 21 April 2017. Available from [https://www.nzma.org.nz/\\_data/assets/pdf\\_file/0009/55674/NZMA-Submission-on-draft-Antimicrobial-Resistance-Action-Plan.pdf](https://www.nzma.org.nz/_data/assets/pdf_file/0009/55674/NZMA-Submission-on-draft-Antimicrobial-Resistance-Action-Plan.pdf)

<sup>2</sup> NZCPHM. Antimicrobial Stewardship and Infection Control: Limiting the burden of antimicrobial resistance in New Zealand. Available from [https://www.nzcpmh.org.nz/media/97734/2016\\_08\\_24\\_nzcphm\\_antimicrobial\\_resistance\\_policy\\_statement.pdf](https://www.nzcpmh.org.nz/media/97734/2016_08_24_nzcphm_antimicrobial_resistance_policy_statement.pdf)

accompanying the community antibiotic use map and the two questions that HQSC is seeking feedback on, we are concerned that this may be the intention. We note that the development of this domain is linked to the activity of the National Antimicrobial Resistance Action Plan to “analyse antimicrobial dispensing data to identify prescriber types, report this data back to prescribers and use it to develop and target interventions to influence appropriate antimicrobial prescribing.” While we strongly support this activity, we do not believe that the data presented in this domain are suitable to influence antimicrobial prescribing. We elaborate on our rationale in our answers to HQSC’s questions about the accuracy of the information and factors that may be contributing to the observed variation.

**Do you believe that any of the information is inaccurate?**

3. While the data on community antibiotic dispensing are likely to be accurate, it is inappropriate to use these data as a quality indicator for appropriate prescribing. Furthermore, we believe that the interpretation of the data that is given in the accompanying commentary is inaccurate. Limitations in the information collected and presented as part of this domain mean that it is impossible to accurately interpret observed variations. For example, there is no information on indications for antibiotic dispensing or on patient outcomes making it impossible to know whether antibiotics are being used appropriately or inappropriately.

4. While there is little doubt that a proportion of community antibiotic prescribing across the board is inappropriate, the data do not allow any conclusions to be drawn about whether the percentage of inappropriate prescribing is any higher in DHBs with higher antibiotic dispensing rates. As such, there is a risk that using these observed variations to drive changes in prescribing practice could have serious unintended consequences. For example, reducing antibiotic use where it is high, but appropriate, particularly in vulnerable populations, could result in worsening of existing inequities in outcomes of infectious disease. While league tables and reporting, in association with comparisons with a ‘national rate’, may be useful in raising research questions, they are inappropriate as a tool to drive behavioural change in prescribers.

5. It is of concern that the commentary appears to assume that higher rates of antibiotic use are inappropriate and does not consider clinical reasons for such observations. For example, the commentary states that “increased prescribing in winter may indicate that antibiotics are being prescribed for individuals with colds and flus and therefore represents an opportunity to reduce antibiotic use.” Seasonal variation should not necessarily be interpreted to mean that the percentage of inappropriate prescribing goes up in winter. An increase in winter prescribing may actually be due to an increase in complications arising from winter colds and flus such as complicated bronchitis and pneumonias. Such prescribing would therefore be entirely appropriate. Similarly, the commentary draws attention to the observation that dispensing of antibiotics specifically indicated for UTIs increased sharply with age and was six-fold higher in women than men. To suggest that this increase reflects inappropriate treatment of asymptomatic UTIs is an assumption that is unfounded—no consideration is given to the fact that postmenopausal women with atrophic vaginourethritis are at increased risk of UTIs. Likewise, the increased dispensing of amoxicillin with clavulanic acid in men may reflect increased ‘dirty’ injuries in this group.

6. The proposed indicator in this domain does not account for factors that are arguably important in driving antimicrobial resistance, such as the following:

- duration of antibiotics prescribed for each course
- number of antibiotic courses prescribed to any individual
- appropriateness of antibiotic dosing
- relative ecological impacts of different antibiotic agents prescribed.

Another factor that is needed is age-standardisation, where population structures are age-sensitive—particularly with respect to ethnicity. We have provided further details about the need for age-standardisation in our submission on the opioid domain of the Atlas of Healthcare Variation and direct HQSC to this submission<sup>3</sup> and the accompanying technical appendix.<sup>4</sup>

### **What do you believe is contributing to the observed variation?**

7. This question invites oversimplification and speculation. While the observed variations in antibiotic dispensing are interesting, they are only useful in so much as they raise research questions about why the variation exists. Answering these questions would require a series of carefully designed epidemiological studies to disentangle the various drivers of antibiotic use because of the complex interactions between them. Confounding is likely to be a major challenge. For example, community antibiotic use is significantly positively correlated with rates of household crowding, rates of socioeconomic deprivation, the proportion of the population under five years, the proportion of the population of Pacific Island ethnicity and the proportion of the population of Asian ethnicity. Nevertheless, possible factors contributing to the observed variation in community antibiotic dispensing include, but are not limited to, the following:

- Variation in infection rates that legitimately require antibiotics, variations in comorbidities such as diabetes, lung disease and obesity, and variations in the social and environmental determinants of infections (eg, higher rates of skin and soft tissue infections and pharyngitis in young Pasifika children, and pneumonias among those living in crowded conditions / suboptimal housing)<sup>5</sup>
- Variations in inappropriate prescribing due to a variety of factors including variations in patient awareness / expectations. For example, patients that pay for health services often expect to receive treatment and may feel short-changed if they are not given something such as a prescription for an antibiotic despite being diagnosed with a viral illness.
- Random variation due to the limitations of sampling (although statistical analysis and the calculation of confidence intervals can be used to evaluate the extent which this is an issue)
- Variations in access to prescribers of antibiotics (eg, due to geographical, financial, cultural, educational and other factors)
- Variations in healthcare seeking behaviour (the data do not account for the number of visits per individual as the denominator is expressed as per 100 persons).
- Variations in age, ethnicity and socio-economic status.

8. It is our view that focussing solely on inappropriate over-prescribing risks health losses from missing opportunities to appropriately prescribe for people in high need. For example, a recent paper in the New Zealand Medical Journal has argued the need for greater consideration as to whether the dispensing rates of antibacterials align appropriately with the higher infectious

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<sup>3</sup> NZMA submission on Atlas of Healthcare Variation | Opioid domain. 12 December 2014. [https://www.nzma.org.nz/\\_data/assets/pdf\\_file/0006/38652/subHQSC-Atlas-of-Healthcare-Variation-Opioid-Domain.pdf](https://www.nzma.org.nz/_data/assets/pdf_file/0006/38652/subHQSC-Atlas-of-Healthcare-Variation-Opioid-Domain.pdf)

<sup>4</sup> Appendix: Technical addendum to NZMA submission on HQSC Atlas of Healthcare Variation – Opioid Domain. Available from [https://www.nzma.org.nz/\\_data/assets/pdf\\_file/0005/38651/Appendix-Technical-Addendum-to-NZMA-submission-on-HQSC-Atlas-of-Healthcare-Variation.pdf](https://www.nzma.org.nz/_data/assets/pdf_file/0005/38651/Appendix-Technical-Addendum-to-NZMA-submission-on-HQSC-Atlas-of-Healthcare-Variation.pdf)

<sup>5</sup> Walls G, et al. Socioeconomic factors correlating with community antimicrobial prescribing. N Z Med J. 2015 Jul 3;128(1417):16-23; Baker MG, et al. Increasing incidence of serious infectious diseases and inequalities in New Zealand: a national epidemiological study. Lancet. 2012 Mar 24;379(9821):1112-9; He Kainga Oranga / Housing and Health Research Programme. University of Otago, Wellington, 2013. Infectious Diseases Attributable to Household Crowding in New Zealand: A Systematic Review and Burden of Disease Estimate. <http://www.healthyhousing.org.nz/wp-content/uploads/2010/01/HH-Crowding-ID-Burden-25-May-2013.pdf>

disease burden in Māori and Pacific populations<sup>6</sup>. Overall, the authors suggest that Māori and Pacific Peoples might well be under-prescribed antibacterials relative to their disease burden. The authors go on to caution that unless programmes aiming to reduce the general rates of antimicrobial treatments are very carefully designed, they could worsen already existing inequity gaps in access. Worse, they may contribute to inequitable health outcomes for Māori and Pacific Peoples.

9. In summary, while we welcome initiatives to influence appropriate antimicrobial prescribing, we do not support the use of observed variation in the community antibiotic use domain (as currently presented) in the Atlas of Healthcare Variation as a quality marker or indicator at the national level. Measures of antibiotic use are needed, but these need to identify prescribing that is more clearly inappropriate. We would be more supportive, in principle, of measures that focus on changes over time for each region rather than measures that focus on comparisons with a national standard or benchmark.

We hope our feedback is helpful.

Yours sincerely

A handwritten signature in blue ink that reads "K. Baddock". The signature is fluid and cursive, with a long, sweeping tail on the final letter.

Dr Kate Baddock  
NZMA Chair

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<sup>6</sup> Metcalfe S, et al. Over and under? Ethnic inequities in community antibacterial prescribing. NZ Med J 2019;132(1488)