Can antibiotic prescribing for respiratory infections be reduced?

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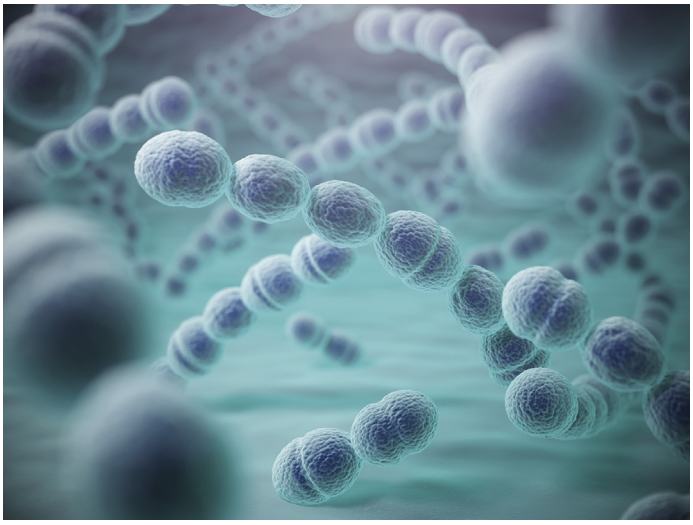
It must be — as an essential component of the response to the antimicrobial drug resistance problem

The growing threat of antimicrobial drug resistance (AMR) is attracting the attention of national governments and international organisations. In the words of Margaret Chan, Director-General of the World Health Organization, "We are hearing one alarm bell after another."[1] This is apparent in primary care, where the frequency of antibiotic-resistant infections is increasing. The emergence of AMR is a multifaceted societal problem that requires action from a range of actors, including the pharmaceutical, agricultural and food production industries.[2] But it is the health care sector, where antibiotics are prescribed and patients with resistant infections are seen, that the impact of AMR is most acute. This is especially relevant in Australia, where antibiotic consumption is among the highest of the OECD countries.[3]

Primary care accounts for nearly three-quarters of all antibiotic prescribing in England, and respiratory tract infections (RTIs) comprise the largest single group of indications for antibiotic treatment.[4] The article by McCullough and colleagues in this issue of the *MJA* reports on the use of antibiotics for treating respiratory infections in Australia.[5] Their study reveals that acute respiratory infections account for more than half of all antibiotics prescribed in primary care, but fewer than one-quarter of prescriptions for antibiotics — and possibly as few as 11% — could be justified with reference to Australian prescribing guidelines.

The situation is similar in the United Kingdom, where general practitioners prescribe antibiotics at about 52% of consultations for self-limiting RTIs, including common colds, acute cough and bronchitis, sore throat, otitis media, and rhinosinusitis,[6] and with little change in practice over the past two decades.[7,8] Evidence from randomised controlled trials indicate that antibiotics generally have little if any effect on the severity or duration of symptoms in these conditions, and treatment is frequently associated with unwanted side effects, such as rashes and diarrhoea.[9,10] Consequently, UK guidelines recommend that a no-antibiotic prescribing strategy be agreed with most patients who present with self-limiting RTIs.[11] The widespread use of antibiotics also has the effect of medicalising conditions that are usually self-limiting and which most



patients could manage themselves. Giving a patient even one antibiotic prescription greatly increases the likelihood that they will also visit a GP for future episodes of similar conditions.[12]

Prescribing an antibiotic may sometimes be motivated by the perceived risk of complications. Antibiotic treatment is associated with reduced risks of peritonsillar abscess after sore throat, and of mastoiditis after otitis media, but these complications are so rare that more than 4000 patients would need to be treated with antibiotics to prevent one case.[13] We recently reported a study of 610 UK general practices, with 45.5 million person-years of follow-up between 2005 and 2014.[14] We estimated that if a general practice with the UK average list size of 7000 patients reduced the proportion of RTI consultations at which antibiotics were prescribed by 10%, it might see one additional case of pneumonia each year and one of peritonsillar abscess each decade. There was no evidence that mastoiditis, empyema, meningitis, intracranial abscess, or Lemierre syndrome were more frequent at low-prescribing practices. Current evidence suggests that antibiotic prescribing is not justified on safety grounds for most patients presenting with RTIs; GPs can use existing guidelines to target patients who are at increased risk of complications because of severity of illness, age or comorbidity.[11]

Physicians should be able to prescribe antibiotic therapy when it is necessary, and several approaches to promoting more effective antibiotic stewardship in primary care are now being explored. Deferred or delayed prescribing, in which a prescription is given but only filled if needed, is sometimes advocated, but this approach may be less effective in reducing antibiotic use than a no-prescribing strategy, while achieving similar patient satisfaction.[15] Point-of-care testing for biomarkers of bacterial infection that enables targeted prescribing of antibiotics is being developed as a strategy, but its effectiveness is not yet fully established, and it may be difficult to integrate into normal clinical practice.[16] Behavioural insights are also being harnessed; for example, sending high-prescribing GPs in England a personalised letter

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signed by the Chief Medical Officer resulted in a 3% reduction in antibiotic dispensing.[17] A contractual financial incentive ("quality premium") for meeting targets for reducing antibiotic prescribing has been introduced by the English National Health Service, with favourable initial results.[18]

If the alarm bells are to be dampened, reductions in national levels of total antibiotic prescribing will be required. This might be achievable, with the latest figures indicating that antibiotic prescribing in primary care in England was 7.9% lower in 2015 than in the preceding year.[19] Sharing national data on successful antibiotic campaigns is one way to contribute to improving global health.

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