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Implications of non-prescription antibiotic sales in China

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The Article by Jie Chang and colleagues published in *The Lancet Infectious Diseases*[1] is very timely. It reflects a crucial need for concerted efforts to reduce irrational use of antibiotics to lower rising antimicrobial resistance.[2–4] Overuse has resulted in antibiotics becoming the most commonly used drugs globally.[3,5] Antimicrobial resistance increases morbidity, mortality, and costs because health systems run out of options to treat common infectious diseases.[1,2,6,7] Low-income and middle-income countries (LMICs), including China, are a particular concern given their increasing overuse of antibiotics[8] coupled with a greater effect of antimicrobial resistance than in high-income countries, because of living conditions, including poor sanitation, malnutrition, and high population density.[8]

A particular issue in LMICs is inappropriate non-prescription antibiotic sales for self-limiting diseases, such as diarrhoea and upper respiratory tract infections (URTIs) caused by viruses.[1,3–5,7,8] Concerns are exacerbated by often shorter courses than those recommended and inappropriate antibiotics being dispensed.[3] Overall, non-prescription sales of antibiotics in LMICs account for up to 93% of dispensed antibiotics, with up to 100% of pharmacists dispensing antibiotics without a prescription in some LMICs, despite legislation against such practice.[1,4,5,8,9] Ours and others' experience is that non-prescription antibiotic sales are driven by multiple reasons, including pressure from patients and financial reasons (ie, profit-motivated community pharmacists fearing the loss of clients seeking antibiotics to competitors, and high proportions of patients who cannot afford physician fees who opt to self-medicate and for out-of-pocket purchases). Ease of access to antibiotics and weak enforcement of regulations also enhance non-prescription sales. Cultural issues and poor levels of education[1,5,8] also affect patients' behaviour.

Consequently, community pharmacists are a crucial component to improve the management of patients with URTIs and paediatric diarrhoea, particularly because they are often the first health-care professional that patients consult.[1,10] However, there are concerns regarding their knowledge of antibiotics, antimicrobial stewardship, and antimicrobial resistance.[1,11–13] Initiatives are needed to address this problem.

The comprehensive approach by Chang and colleagues[1] using simulated clients provides further insight into non-prescription sales of antibiotics in China, where the authorities are seeking to change behaviour. The use of simulated clients helps to gain an accurate insight into not only pharmacists' but also other health professionals' behaviour towards antibiotics.[1,8,10] Although there are still concerns with the high proportion of non-prescription sales of antibiotics among community pharmacists across China (48·5% for paediatric diarrhoea and 70·1% for URTIs), and only a limited number asked the simulated clients about taking other medicines (6·6–9·7%) or their allergies and issued advice on medicine taking (16·1–29·2%), there were encouraging signs. Sales were significantly less common in urban areas, when a pharmacist was on duty, and when the pharmacy was part of a chain.[1] In addition, multiple initiatives in Shaanxi province, including stricter regulations for dispensing antibiotics, a qualified pharmacist's presence to dispense antibiotics, increased frequency of unannounced pharmacy inspections, punishments for antibiotics misuse, and improving pharmacists' education, resulted in decreasing antibiotic sales between 2011 and 2017.

From the findings of Chang et colleagues' study and our experience, we believe that several strategies can be implemented to reduce non-prescription antibiotic sales. These strategies include improving pharmacists' knowledge and practice of antimicrobial stewardship, starting in pharmacy school in addition to the use of the internet and educational workshops after qualification,[1] and making pharmacists more aware of the WHO AWaRe antibiotic list, particularly which antibiotics not to dispense, as well as developing and implementing national guidelines for pharmacists.[1,4,10,14] Other activities include reinforcing legislation where

pertinent, instigating IT surveillance systems to track antibiotics through the supply chain, monitoring pharmacy activities using mobile technologies, and educating patients on the dangers of self-medication with antibiotics. Multifaceted programmes are typically needed to change behaviour. Notwithstanding that community health campaigns are more challenging in LMICs,[15] by championing pharmacists as antibiotic guardians, they can take the lead to improving antibiotic use in the community and reduce antimicrobial resistance.

*Aubrey Kalungia, *Brian Godman*
Department of Pharmacy, University of Zambia, Lusaka, Zambia (AK); Department of Pharmacoepidemiology, Strathclyde Institute of Pharmacy and Biomedical Sciences, University of Strathclyde, Glasgow G4 0RE, UK (BG); Division of Clinical Pharmacology, Karolinska Institute, Karolinska University Hospital Huddinge, Stockholm, Sweden (BG); Department of Pharmacy, Faculty of Health Sciences, Sefako Makgatho Health Sciences University, Pretoria, South Africa (BG); and Health Economics Centre, University of Liverpool Management School, Liverpool, UK (BG)
brian.godman@strath.ac.uk

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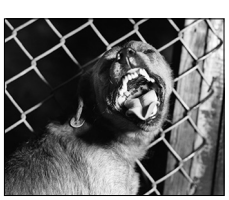
Improving human rabies post-exposure prophylaxis

In *The Lancet Infectious Diseases*, Tineke Cantaert and colleagues[1] illustrate a strong commitment in Cambodia to preventing human rabies by rapid intradermal delivery of post-exposure prophylaxis. The investigators included 116 people bitten by rabies virus-positive dogs and 20 people bitten by rabies virus-negative dogs who attended Institut Pasteur du Cambodge, Phnom Penh, Cambodia, between April 20, 2016, and Feb 9, 2018. Patients received intradermal vaccination on days 0, 3, 7, and 28, and serum samples were obtained for detection of rabies virus neutralising antibodies on days 0, 7, 28, and 42. This well designed cohort study showed that exposed people had rabies virus neutralising antibody titres after three rabies vaccine sessions (of two intradermal doses each) that were similar to titres observed immediately before a fourth vaccine session on day 28. The authors concluded that rabies post-exposure prophylaxis could be abridged to a 1-week (three sessions of two doses on days 0, 3, and 7) intradermal regimen. Recognising the possibility of long incubation periods, the investigators contacted all patients after 1 year and found that all were still alive. These compelling data help identify the best use of human rabies post-exposure prophylaxis in developing countries, which should be used in combination with mass vaccination of dogs.

Historically, the intradermal route has been considered a favourable alternative to the subcutaneous or intramuscular delivery of immunogens during vaccination against several infectious diseases, including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