

Dear Editor,

We thank the authors for their letter relating to our paper “Selling antibiotics without prescriptions among community pharmacies and drug outlets: a simulated client study from Ghana” [1].

We agree that pharmacists’ motivation to help patients presenting with infectious symptoms is not the sole explanation for observed dispensing practices within our study or elsewhere. Our descriptive paper did not aim to identify the underpinning reasons behind the sale of antibiotics without prescriptions but only postulated this as one potential factor that may influence dispensing under client pressure. It is well-known in the literature that the issue of selling antibiotics without prescriptions is complex and multifactorial [2-4]. Within our paper we considered a number of social, cultural, economic, and educational factors that may influence inappropriate dispensing practices in Ghana [2, 3, 5, 6]. Additionally, we emphasised the importance of interventions targeting multiple stakeholders and the need for qualitative studies and behaviour change initiatives including follow-up in-depth qualitative interviews to monitor changes. A recent detailed Pan-African narrative review explores these factors within the region’s context including multiple suggestions for all key stakeholder groups to enhance appropriate dispensing of antibiotics [4]. Enhancing appropriate dispensing is key especially in low-and middle-income countries (LMICs) where there are high co-payments to see both a physician and purchase medicines, as well as long waiting times and associated costs with seeing a healthcare professional in a clinic versus the convenience of community pharmacies [2, 3, 4, 6].

We note the authors state that sales of antimicrobials without a medical prescription for recurrent infections such as uncomplicated urinary tract infection (UTI) and genital herpes might be justified. We see this in Ghana where some antibiotics are permitted by law to be

dispensed without a medical prescription based on the professional judgment of a licensed pharmacist such as in the symptomatic treatment of sexually transmitted infections. This serves an important public health function in situations where there are limited medical or laboratory facilities. However, we acknowledge there is a risk of overtreatment in this situation. We also note that in some high-income countries, community pharmacies can dispense antibiotics without a prescription such as the Pharmacy First initiative in the UK for women with uncomplicated UTIs aged 16-65 years but excluding those who have had treatment for their UTI in the past 28 days (i.e., recurrent infection) [7]. It is also important to note the clear distinction between pharmacies and over-the-counter medicine sellers (OTCMS) among LMICs. In Ghana, the latter are legally prohibited from selling antibiotics except trimethoprim-sulfamethoxazole based on the Ghanaian Food and Drugs Authority classification list of over-the-counter medicines in Ghana. The authors only make mention of pharmacies or pharmacists in their response. This is a concern as there can be a broad range of personnel selling and dispensing antibiotics across LMICs apart from community pharmacists, many of whom may not have the requisite training to dispense antibiotics appropriately especially for essentially viral infections [2]. This is compounded by the selection of two simulated cases in our study where the enacted symptoms are clearly defined by the Ghanaian National Standard Treatment Guidelines (NSTGs) and for which no antibiotic treatment is recommended [8]. Consequently, all simulations resulting in antibiotic dispensing observed in our study were inappropriate as per the Ghanaian NSTGs, with similar guidance in the AWaRe book [9].

In view of this, we disagree that the sale of “Access” antibiotics for paediatric diarrhoea is at least promising. The pharmacological intervention for the treatment of the simulated case is fluid management according to the NSTG, and the AWaRe guidance, with antibiotics only recommended in cases of dysentery or in immunocompromised patients [8, 9]. Similarly, the first line treatment for patients with URTIs of viral origin should be symptomatic relief and not

antibiotics [8]. It is worth noting that antimicrobial resistance (AMR) is not the only consequence of inappropriate dispensing of antibiotics but also potential medication adverse events which could exacerbate gastrointestinal symptoms [10]. Furthermore, one of the most frequent "Access" antibiotics observed in our study was amoxicillin-clavulanic acid, a broad-spectrum antibiotic, whose wide use should be limited as correctly pointed out by the authors.

Implementing the use of very small boxes of antibiotics in pharmacies was suggested by the authors as a regulatory measure to promote the widespread use of short courses for community-acquired infections and to curb exposure in cases of viral or self-limiting infections. We acknowledge that this pharmacist-led strategy might have merit. However, we want to emphasize caution that without a background assessment of perceptions from both dispenser and client standpoints, as well as outcome and process evaluations of such an intervention, the intended benefits may not be readily replicated due to contextual differences. Guidance on the suggested antibiotic, and the length of the course of treatment, should be in line with international recommendations such as those from the AWaRe book to reduce AMR [9]. This is especially important when antibiotics are given to treat prevalent viral infections such as upper respiratory tract infections (URTIs) that do not require antibiotics as this will increase AMR given the likely large volume and scale of such practice [4].

Some studies also draw attention to the variable impact of law enforcement and other interventions, together with their sustainability, aimed at curbing inappropriate antibiotic dispensing globally, and how these were seen for specific indications, antibiotics, and settings [4,11,12]. This is also in line with an earlier statement in the authors' second paragraph highlighting the need to tackle both the attitudes of dispensers and the general population to curb indiscriminate over-the-counter antibiotic sales. This has worked well in the Republic of Srpska where a combination of greater enforcement of current regulations coupled with the availability of guidelines in pharmacies helped to appreciably reduce the extent of antibiotics

dispensed without prescription [13]. We have also seen in some African countries that the availability of universal healthcare, coupled with educating pharmacists and monitoring of pharmacy practice, has limited self-purchasing of antibiotics in reality [4].

Whilst it is critical to restrict injudicious and inappropriate use of antimicrobials, this has to be balanced against the importance of access to potentially low cost, life-saving treatments in resource poor settings. Equitable solutions are required and detailed regulations and criteria for access need to be developed. Equitable solutions could include the development of appropriate quality indicators based on recognised guidelines such as the AWaRe guidance along with instigating IT surveillance systems to better track the passage of antibiotics through the system as well as better monitoring of dispensing activities through for instance mobile technologies in Africa [4]. However, long term solutions to improve antibiotic use can only be reached through the involvement of all key stakeholders coupled with robust analyses of successful interventions to provide future direction. Context and timing are also important when conducting and analysing studies. For instance, we understand that Tarragona Health District is a rural area in Catalonia where access to emergency care may be more than 50 km away. We also understand that the practice of advancing medication pending a medical prescription in case of emergency was frequent at the time of the study of Guinovart *et al.* (2015) despite current regulations [14], which may have influenced the findings compared to other health districts in Catalonia at that time. With very robust information technology systems now in place in Catalonia documenting both the dispensing and outcomes of medicines across the sectors, the situation at present may differ from what was previously observed [15]. Similarly, in South Africa, there have been very different rates for the dispensing of antibiotics without a prescription depending on issues including location and pharmacy type [4]. Lastly, the timing of such studies can also be important. For instance, there used to be robust systems and activities in place in Zimbabwe to limit the purchasing of antibiotics without a prescription [4].

However, as a result of the current economic climate, patients now typically buy their antibiotics from informal sellers [4].

We wish to conclude by reiterating the complex nature of the issue of selling antibiotics without prescriptions among community pharmacies and drug outlets, especially within Africa and other LMICs. Tackling this issue will require multidisciplinary, multifaceted, evidence-based and theory driven interventions that are culture and context specific and involve all key stakeholders including patients, general population, clinicians, and policy makers [4].

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