

## Engaging the private sector to improve antimicrobial use in the community

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Antimicrobial resistance (AMR) is one of the world's most pressing public health threats. It increases the cost of health care through longer duration of illness and hospital stays,<sup>1</sup> additional tests,<sup>1</sup> and the need for more expensive drugs.<sup>2</sup> Around 700,000 people die of resistant infections every year globally.<sup>3</sup> It has been projected that between now and 2050, AMR will result in around 10 million deaths with an associated economic cost, incurred by lost global production, of 100 trillion USD.<sup>3</sup>

AMR refers to the ability of a microorganism to stop an antimicrobial (such as an antibiotic, antiviral or antimalarial) from working against it. As a consequence of AMR, standard treatments become ineffective, and infections persist and may spread to others. The impact of AMR is far-reaching and equates to the situation before the discovery of antibiotics, when even small infections were difficult, or very often impossible to treat, and medical procedures too risky to perform due to the potential of untreatable infection.

According to the WHO, Southeast Asia is at the highest risk globally for the emergence and spread of AMR, predominantly due to the inappropriate use of antibiotics and weak systems of governance in health and agriculture.<sup>4,5</sup> Excessive use of antibiotics for upper respiratory tract infections (URTI), where infection is commonly caused by a virus, is of particular concern in the region.<sup>6</sup> A review by the WHO of studies published between 1990-2006 shows that between 40%-60% of viral URTI cases in South East Asian countries were treated with antibiotics,<sup>7</sup> with the rate significantly higher in private facilities compared to public.<sup>7</sup> Common drivers of inappropriate use of antibiotics include poor knowledge, perceived patient demand, economic incentives, pressure from pharmaceutical marketing, unstable drug supply, lack of regulation and enforcement, particular social and cultural norms around medicine use, and health seeking preferences.<sup>8-11</sup>

In 2011, health ministers in the Southeast Asian region adopted the Jaipur Declaration on AMR, calling for comprehensive action against the irrational use of antibiotics.<sup>12</sup> Most recently, the Berlin declaration by G20 health ministers in May, 2017 recognised the increasing threat of AMR and outlined various measures to address it.<sup>13</sup> The region's member states are currently implementing national action plans to tackle AMR.<sup>14</sup> Indonesia's National

Action Plan on Antimicrobial Resistance (NAP AMR) was shared at the WHO General Assembly in May, 2017.<sup>15</sup> Key supply-side initiatives of NAP AMR include (i) regulation of the production and distribution of antibiotics (e.g. coordination with the drug regulatory authority to develop regulations and quality checklists for the import, manufacture, quality, distribution, market authorization, advertising, and inspection of antimicrobial agents; and the promotion of investment in developing new medicines, diagnostic tools, vaccines and other interventions);<sup>16,17</sup> (ii) AMR control programmes in public hospitals (e.g. linking the AMR control activities with hospital accreditation systems and training healthcare workers and staff in infection prevention control procedures and guidelines;<sup>17,18</sup> and (iii) hospital surveillance (e.g. scrutiny of antimicrobial prescribing, use, resistance, and monitoring hospital acquired infection).<sup>16,17</sup> On the demand side, several awareness campaigns and training programmes have also been rolled out to improve knowledge about AMR among community groups, professional and government organisations, and journalists through platforms such as social media, workshops, and seminars.<sup>16,17,19</sup> These various initiatives are still in their infancy and to our knowledge, their impact is yet to be comprehensively evaluated.

A recent systematic review of the impact of interventions to promote more effective use of antibiotics in low- and middle-income countries (LMICs) highlights the importance of improving the availability of diagnostic testing; providing dedicated education on AMR for both healthcare providers and the wider public; and strengthening (inter)national agencies responsible for the enforcement of regulations and auditing of the production, distribution and dispensing of antibiotics.<sup>20</sup> Current evidence and policies for action on AMR focus heavily on the *public* sector. This is despite the fact that private drug sellers—which typically include pharmacies, drug stores, general stores and itinerant vendors—are often the first point of contact and a major source of medicines and care in LMICs.<sup>21,22</sup> For example, in Indonesia, 93% of patients are reported to obtain their antibiotics from these providers.<sup>23</sup> Data from the Indonesian Ministry of Health shows that there are at least 26,658 licensed community pharmacies

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and 13,477 licensed drugstores across the country's 34 provinces.<sup>24</sup> In addition, there are at least 95,000 unlicensed outlets, consisting of 5,000 drug stores and 90,000 kiosks across the country.<sup>25</sup> These private providers are often preferred because they are accessible, convenient and reliable sources of affordable medicines,<sup>26</sup> but they also tend to be unregulated and staffed by largely untrained personnel.<sup>21</sup>

The regulation and control of antibiotic use by private drug sellers is challenging. In Indonesia, antibiotics should only be dispensed by licensed pharmacists. Licenses for pharmacies are issued by the local district authority and involve submitting qualification and accreditation documents to the District Health Office (DHO), inspection of the facilities by the DHO and Food and Drug Administration (FDA) and subsequent processing of license applications by the DHO and FDA. In reality overall market control is weak<sup>25,27</sup> with many unlicensed drug stores freely selling antibiotics.<sup>27-30</sup> This situation is not unique to Indonesia with studies showing that antibiotics are widely available from unlicensed village grocers or drugstores in Thailand, Cambodia and Vietnam.<sup>31-33</sup>

Another regulation designed to encourage appropriate use of antibiotics by private drug sellers in Indonesia is the dispensing of prescription-only antibiotics.<sup>34</sup> In Indonesia and many other LMICs,<sup>35</sup> this regulation is poorly implemented and enforced.<sup>21,27,36-39</sup> For example, it has been estimated that around 86% of Indonesians currently obtain antibiotics from private drug sellers without a prescription and without adequate information and history gathering.<sup>21,37,38</sup> Concerns have also been raised in Indonesia about the repackaging of larger and often cheaper units of antibiotics without any label,<sup>27</sup> and the dispensing of poor quality antibiotics by community pharmacies, shops and kiosks.<sup>27</sup> Studies of private drug sellers in other LMICs have reported the dispensing of expired antibiotics<sup>40</sup> and the provision of incomplete or shorter treatment courses, particularly in the case of patients who are thought to be too poor to afford a complete dose.<sup>40,41</sup>

The private sector has been an overlooked but major source of AMR in many LMICs, including Indonesia. Private drug sellers such as community pharmacies and drug stores therefore have a major part to play in educating patients, rationalising antibiotic use, and stopping antibiotic sales without a prescription. Drafting new laws and regulations to govern the private sector is, however, unlikely to provide a comprehensive solution to the problem of AMR.<sup>42</sup> AMR research must be broadened to include the evaluation of multi-faceted interventions that better reflect the complex

incentives and preferences of private drug sellers and their clients. This evidence is urgently needed as countries like Indonesia finalise their National Action Plans and begin rolling out AMR related activities.

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