# Engaging the Private Sector to Address Antimicrobial Resistance:

## Guidance for Country-Specific Planning in Asia-Pacific

## I. What: Introduction to Guide Contents & Purpose

This regional guide aims to provide a framework for Ministries of Health (MOHs) and other stakeholders involved in antimicrobial stewardship (AMS) to develop a country-specific plan for engaging the private sector to effectively address antimicrobial resistance (AMR). Private healthcare providers serve as the first and sometimes only point of healthcare for a large portion of the population in Asia-Pacific, particularly in areas where public healthcare systems may have limited capacity to meet the healthcare needs of all. With the tremendous capacity to reach the populations they serve, engaging private providers and others involved in manufacturing, prescribing and distributing antibiotics through private sector channels at multiple levels of national health systems becomes critical to impactful AMS. The World Health Organization (WHO) defines AMS, together with infection prevention and medicine safety, as one of three pillars which are critical to health systems strengthening in low- and middle-income countries (LMICs). When combined with antimicrobial use surveillance, AMS guides appropriate use of antimicrobials to control AMR.[1]

To date, pragmatic guidance outlining how to effectively engage with the private sector to effectively address AMR has been scarce. This regional guide attempts to remedy that deficiency and make it easier for MOHs in Asia-Pacific to plan to utilize the resources, reach, and expertise of private sector actors to contribute to effective AMS strategies. To inform this guide, SwipeRx and CAPTURA2 completed a rapid review in early 2024 of published literature and other online references describing effective private sector engagement (PSE) efforts, with a focus on published experiences in Asia-Pacific. This guide also incorporates recommendations from the WHO's Interagency Coordination Group on Antimicrobial Resistance for systematic engagement of and enhanced action from the private sector to address AMR at global, regional, national, and subnational levels.[2] Opportunities to effectively engage the private sector to contain AMR can be organized in the following four recommended PSE objectives:

1. Collect, analyze, and **use private sector data related to antimicrobial resistance (AMR), consumption (AMC), and use (AMU)** at multiple levels of the health system, including community, to inform national surveillance
2. **Facilitate responsible antibiotic prescribing and dispensing** practices through private provider capacity building, monitoring and incentives
3. **Ensure an ethical supply chain** for antimicrobials, from manufacturing to dispensing to managing waste
4. **Test innovative approaches** with the private sector to prevent AMR by increasing access to diagnostics and immunizations and use of infection prevention measures through private channels at multiple levels, including community

[1] WHO, AMS Programmes I Healthcare Facilities in LMICS: A Practical Toolkit. 2019. AMS Toolkit WHO 2019
[2] WHO Interagency Coordination Group on Antimicrobial Resistance.

While this guide is not designed as a resource-generation tool, the stakeholder mapping includes individuals with potential to influence national budget support as well as external funding to support PSE for AMR priorities identified by using this guide.

## II. Why: Private Sector Is Critical Partner in Addressing AMR

Rates of antibiotic resistance in Asia-Pacific are among the highest in the world. Of the estimated 1.27 million global deaths attributable to AMR annually, more than half occur in Asia-Pacific.[3] In the WHO Western Pacific Region alone, experts predict that AMR-related deaths could reach as high as 5.2 million annually and exceed $148 billion in economic costs by 2030.[4] Factors driving AMR in Asia-Pacific underscore the importance of engaging private as well as public healthcare workers at multiple levels of national health systems. These factors include:

*Infectious disease burden:* The Asia-Pacific region bears significant burdens of tuberculosis, malaria, sexually transmitted infections including HIV, and viral hepatitis.[5][6][7] Low rates of diagnosis and treatment of these illnesses, combined with extensive use and misuse of antimicrobial drugs through private and public healthcare channels, has accelerated resistance.[8][9]

*Fragile health systems:* Few health systems in the region utilize an integrated health system approach to ensure access to and appropriate use of antibiotics and other medicine. Capacity and accountability to formulate and implement policies encouraging proper antibiotic use in both private and public channels is often lacking.[10] As a result, antibiotics are often overprescribed and readily available through private channels,[11] facilitating misuse and contributing significantly to resistance.[12] While most countries have clear policies governing appropriate antibiotic use, there is a lack of capacity, pragmatic tools and resources to

[3] United Nations, "AMR in the Human Health Sector in the Asia-Pacific Region: A Joint Position Paper for the United Nations High-Level Meeting on AMR," 2024.
[4] WHO Western Pacific Region, "Health and Economic Impacts of Antimicrobial Resistance in the Western Pacific Region, 2020–2030," 2023.
[5] WHO, "Global Tuberculosis Report," 2023. https://www.who.int/teams/global-tuberculosis-programme/tb-reports/global-tuberculosis-report-2023.
[6] The Foundation for AIDS Research, "Hepatitis B: A Hidden Public Health Emergency in the Asia-Pacific," 2023.
[7] J. Kevin Baird, "Asia-Pacific Malaria Is Singular, Pervasive, Diverse and Invisible," *International Journal for Parasitology* 47, no. 7 (June 2017): 371–77, https://doi.org/10.1016/j.ijpara.2016.06.006.
[8] Esabelle Lo Yan Yam et al., "Antimicrobial Resistance in the Asia Pacific Region: A Meeting Report," *Antimicrobial Resistance & Infection Control* 8, no. 1 (December 18, 2019): 202, https://doi.org/10.1186/s13756-019-0654-8.
[9] Irene Anna Lambraki et al., "Factors Impacting Antimicrobial Resistance in the Southeast Asian Food System and Potential Places to Intervene: A Participatory, One Health Study," *Frontiers in Microbiology* 13 (January 5, 2023), https://doi.org/10.3389/fmicb.2022.992507.
[10] Holloway K A, Kotwani A, Batmanabane G, Puri M, Tisocki K. Antibiotic use in South East Asia and policies to promote appropriate use: reports from country situational analyses BMJ 2017; 358 :j2291 doi:10.1136/bmj.j2291.
[11] Raphaël M Zellweger et al., "A Current Perspective on Antimicrobial Resistance in Southeast Asia," *Journal of Antimicrobial Chemotherapy* 72, no. 11 (November 2017): 2963–72, https://doi.org/10.1093/jac/dkx260.
[12] Yam, E., Hsu, L., Yap, EH. *et al.* Antimicrobial Resistance in the Asia Pacific region: a meeting report. *Antimicrob Resist Infect Control* 8, 202 (2019). https://doi.org/10.1186/s13756-019-0654-8.

monitor and reward compliance for private providers following recommended prescribing and dispensing practices.[13]

*Limited diagnostic access & immunization coverage:* Across Asia-Pacific, diagnostic and immunization services are often concentrated at larger public-sector health facilities. Few countries in Asia meet global recommendations regarding community-level access to rapid diagnostics and immunizations.[14] [15] Slow and/or opaque regulatory pathways for new, point-of-care rapid diagnostics are also a factor, as are policies and other capacity gaps limiting private sector contributions to immunization access.[16]

*Urbanization, population density & poverty:* High population density and rapid urbanization combined with limited access to water and electricity all threaten the ability of private and public healthcare workers to comply with recommended infection prevention and antibiotic distribution and disposal practices, contributing to the spread of infections, a high demand for antibiotics, and a proliferation of resistant pathogens.[17][18]

## III. Who: Key Stakeholders to Involve in PSE Planning & Implementation

Addressing AMR in the Asia-Pacific region requires a coordinated approach that integrates both public and private sectors. Private healthcare providers play a critical role in the healthcare system, often serving large segments of the population and significantly influencing antibiotic use and management practices. Therefore, engaging the private sector is essential for effective AMR strategies. This section outlines the key stakeholders MOHs should engage to plan and implement PSE aspects of AMR National Action Plans (NAP):

- *Pharmaceutical, vaccine & diagnostic manufacturers, distributors and waste management companies* involved in the manufacturing, distribution, and marketing of antibiotics, diagnostics and vaccination supplies. Their participation is vital for ensuring availability of quality-assured antibiotics, diagnostics and immunizations. Policies governing manufacturing, distributing and waste management of antibiotics are key to ensuring an ethical supply chain.

[13] Martha Coe and Jessica Gergen, "Vietnam Country Brief: Sustainable Immunization Financing in Asia Pacific" (ThinkWell, 2017), https://thinkwell.global/wp-content/uploads/2018/09/Vietnam-Country-Brief-081618.pdf.
[14] Ibid.
[15] Nilubon Subsittipong et al., "Delay in Vaccine Access in ASEAN Countries," *International Journal of Environmental Research and Public Health* 19, no. 7 (January 2022): 3786, https://doi.org/10.3390/ijerph19073786.
[16] UICC, "Antimicrobial Resistance: A Clear and Present Danger," 2023, www.uicc.org/news/antimicrobial-resistance-clear-and-present-danger.
[17] Odion O. Ikhimiukor et al., "A Bottom-up View of Antimicrobial Resistance Transmission in Developing Countries," *Nature Microbiology* 7, no. 6 (June 2022): 757–65, https://doi.org/10.1038/s41564-022-01124-w.
[18] WHO Interagency Coordination Group on Antimicrobial Resistance, "No Time to Wait: Securing the Future from Drug-Resistant Infections," 2019, https://www.who.int/docs/default-source/documents/no-time-to-wait-securing-the-future-from-drug-resistant-infections-en.pdf.

- *Regulatory authorities* who oversee the registration and quality monitoring of antibiotics, diagnostics and vaccines, as well as licensing and accreditation of private providers. Often the regulatory authorities are distinct agencies within the MOH. Their involvement is critical to ensuring that the regulatory pathway for products with potential to contain AMR is as clear and concise as possible. In addition, policymakers who are responsible for licensing private providers and setting professional development requirements are key to include in PSE planning given their ability to positively influence private provider capacity and compliance with key AMR policies.

- *Professional private provider associations representing private providers involved in prescribing and dispensing antibiotics,* such as private pharmacist and private doctor associations or councils. These groups represent private healthcare workers and can help disseminate and encourage compliance with national guidelines related to antibiotic prescribing and dispensing as well as reporting. In addition, these associations often work closely with Ministries and other partners to organize private provider training programs, and advocate for responsible antibiotic practices. These associations, together with universities and training institutions targeting private as well as public health workers, often have valuable perspectives regarding the opportunities and challenges associated with all four PSE objectives outlined in this guide.

- *Civil society organizations (CSO)* and other non-profit or social enterprises working with private sector entities can provide technical assistance and facilitate public-private partnerships relevant to PSE for AMR. These organizations/companies often play a particularly important role in supporting AMR surveillance and AMS programs in LMICs through investments in infrastructure and capacity.

- *Private and public health insurance providers* as well as stakeholders responsible for overseeing social health insurance schemes and criteria for private provider inclusion in these schemes.

- *Resource-influencers* including public sector leaders responsible for national budget allocation decisions as well as external funders in cases where supplemental financial resources are needed.

With support from the stakeholders listed above, the first step towards effective PSE for AMR is to understand the private sector actors with the greatest potential to address AMR in a given country. The following questions are suggested to conduct a rapid “landscaping” to understand key PSE opportunities in a given country context:

- Which private sector providers are already sharing data on AMU, AMC, and AMR with the MOH and others managing national surveillance?
- Which type of private providers prescribe and dispense the largest amount of antibiotics? Hospitals, clinics, pharmacies, informal drug shops, traditional healers, etc.? Can antibiotics be accessed over the counter through these different providers/outlets?
- What are the key policies in place relevant to private sector prescribing, dispensing of antibiotics, provision of routine diagnostics & immunizations? What do the current policies state about which type/level of private providers can offer rapid diagnostic and immunization services?
- Which companies are involved in manufacturing, importing, marketing, and distributing antimicrobials?
- Which actors and policies govern waste management of antibiotics and other medicine?
- What training has been provided by private providers related to AMR in the last 2 years?

Insights related to these questions can be collected through a series of in-depth-interviews (IDI) with key stakeholders, using a locally tailored version of this guide. Please see a guide for IDI in support of PSE in AMR NAPs here.

## IV. How: Private Sector Engagement Strategies

The WHO Interagency Coordination Group on Antimicrobial Resistance emphasizes the private sector's role in a number of areas related to AMS, including the four objectives of the PSE framework outlined below. For each objective, the table below summarizes a few of the key strategies that can be considered by MOHs and others involved in overseeing PSE planning as a critical component of AMR NAPs. The following PSE framework is designed to offer multiple strategy options for each objective, understanding that each country will need to select the approaches most relevant and feasible for their unique context.

## PSE FRAMEWORK

| OBJECTIVES | STRATEGIES |
|---|---|
| **Use private sector data related to AMR, AMC, and AMU** | **Identify types and locations of private providers and channels or health facility/outlet types relevant to AMR/AMC/AMU data collection.** In many countries, resistance data is ideally collected from private as well as public hospitals in both urban as well as rural areas, as consumption and use data is generated at private clinic and pharmacy outlets, as well as public sector equivalents.<br><br>**Collect routine, standardized AMR/AMC/AMU data from private sector actors working at multiple levels of the antibiotic supply chain** including manufacturers or importers, distributors, prescribers and dispenses. Data collection should be planned considering the MOHs capacity to analyze and use collected data**.** Provide standardized reporting forms to facilitate consistent reporting across prioritized private providers/facility or outlet types including private laboratories. Resistance Map is a tool that can help MOHs collate and store data from a variety of private sector sites/channels, including private laboratory data.<br><br>**Analyze collected data to gain insights into AMR/AMC/AMU patterns** at multiple levels within the health system, including community. In addition to AMR/AMC/AMU data mentioned above, analysis of antibiotic prescription claims can help to retrospectively quantify AMU patterns with ambulatory patients served in the private sector, per an antimicrobial surveillance study in Namibia.[19] For more information, please refer to the overview of private data collection and analysis tools later in the report or here.<br><br>**Facilitate data sharing and interpretation** with a mixture of public and private actors to inform changes to the AMR NAP and related operational plans in your country. This may include the creation or use of digital platforms that facilitate periodic private sector data collection as well as data sharing between private and public sectors. In addition, it may include facilitating submissions to WHO GLASS for more comprehensive AMR surveillance, as seen in Kenya.[20] In addition, including private sector representatives – or private doctor |

[19] Pereko D. D. Lubbe MS, Essack SY. Surveillance of antibiotic use in the private sector in Namibia using sales and claims data. J Infect Dev Ctries. 2016 Nov 24:10(11):1243-1249. doi: 10.3855/jidc.7329.
[20] Kleczka B, Kumar P, Njeru MK, Musiega A, Wekesa P, Rabut G, Marx M. Using rubber stamps and mobile phones to help understand and change antibiotic prescribing behaviour in private sector primary healthcare clinics in Kenya. BMJ Glob Health. 2019 Sep 29;4(5):e001422. doi: 10.1136/bmjgh-2019-001422.

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| | and pharmacy association leaders – in meetings designed to interpret national surveillance data is recommended. |
| **Facilitate responsible antibiotic prescribing and dispensing** | **Improve capacity of private providers to comply with recommended prescribing and dispensing practices:** Provide pre-service training and/or continuous professional education to private healthcare providers on appropriate antibiotic prescribing and dispensing practices, including how to counsel clients to reduce consumer demand for antibiotics, per learnings from Bangladesh.[21] Mentorship can be a key enabler of pharmacist-led AMS at private hospitals based on experiences in sub-Saharan Africa.[22] Consider using accredited digital education systems as a lower cost pathway to scaling private pharmacy education, based on learnings from SwipeRx in southeast Asia. Post-training support including job aides and patient counseling materials is key to reinforcing responsible AMU and AMC at outlets where private providers have been trained.<br><br>**Prepare & deploy awareness raising material on AMR with patients** seeking antibiotics from private providers to reduce demand for antibiotics. This may include targeted AMR posters in private health facilities and drug shops, stamps to standardize antibiotic medicine labels, as used in rural Tanzania,[23] as well as other mass media to raise awareness about the risks of overuse of antibiotics.<br><br>**Undertake quality improvement audits:** Utilize tools such as the preferred antibiotics audit tool and digital survey tools - employed by SwipeRx in southeast Asia - to assess the extent to which appropriate prescribing and dispensing practices are taking place. Findings from audits and surveys can be used to inform re-trainings and post-training investments with private providers involved in these key steps of antibiotic access. For more information, please refer to the overview of private data collection and analysis tools later in the report or here.<br><br>**Use incentives & disincentives to motivate compliance:** Consider financial rewards, recognition programs and peer comparisons by the |

[21] Chowdhury F, Sturm-Ramirez K, Mamun AA, Iuliano AD, Chisti MJ, Ahmed M, Bhuiyan MU, Hossain K, Haider MS, Aziz SA, Rahman M, Azziz-Baumgartner E. Effectiveness of an educational intervention to improve antibiotic dispensing practices for acute respiratory illness among drug sellers in pharmacies, a pilot study in Bangladesh. BMC Health Serv Res. 2018 Aug 31;18(1):676. doi: 10.1186/s12913-018-3486-y.
[22] Phanice Ajore Otieno, Sue Campbell, Sonny Maley, Tom Obinju Arunga, Mitchel Otieno Okumu, "A Systematic Review of Pharmacist-Led Antimicrobial Stewardship Programs in Sub-Saharan Africa", International Journal of Clinical Practice, vol. 2022, Article ID 3639943, 16 pages, 2022.
[23] Valimba R, Liana J, Joshi MP, Rutta E, Embrey M, Bundala M, Kibassa B. Engaging the private sector to improve antimicrobial use in the community: experience from accredited drug dispensing outlets in Tanzania. J Pharm Policy Pract. 2014 Sep 17;7(1):11. doi: 10.1186/2052-3211-7-11.

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| | MOH and/or private provider associations, and access to subsidized i.e. non-commercially priced antibiotics to encourage private providers to comply with appropriate prescribing and dispensing practices. Align reimbursement structures (i.e. value-based payments versus fee-for-service) to discourage excessive prescribing. Link adherence to AMR guidelines with accreditation or licensing for healthcare providers and pharmacies. Contemplate penalties for non-compliant private providers, per experiences in Bangladesh.[24] All of these strategies require strong capacity to monitor and enforce compliance either internally by associations or externally by MoH, so this needs to be carefully considered. |
| **Ensure ethical supply chain and disposal** | **Promote & incentivize ethical antibiotic manufacturing practices.** Ensuring that Good Manufacturing Practices (GMP) and related standards are integrated into your national medicine policy as well as regulatory requirements is key to improving manufacturing practices and minimizing waste generation related to manufacturing of antibiotics and other drugs.[25] As a useful reference, the AMR Industry Alliance is actively advocating for adoption of minimum environmental expectations for antibiotic manufacturers.[26] Incentives to promote ethical manufacturing may include accelerated regulatory pathways for manufacturing practices meeting GMP and environmental standards as well as for novel antibiotics with potential to address AMR. Aligning local manufacturing of antibiotics with AWaRe categorization is recommended.<br><br>**Promote & incentivize ethical antibiotic distribution practices** by establishing prequalified antibiotic suppliers for public sector procurements of antibiotics included in the essential medicines list. Determine order quantities based on reliable needs estimation. Focus procurements on essential medicines. Design efficient network of secure storage facilities with access to public and private health units, pharmacies, and other distributors. Collect data on antibiotic stock-keeping-units distributed and reward suppliers who provide data. Mitigate financial incentives linked to antibiotic sales by |

[24] Chowdhury F, Sturm-Ramirez K, Mamun AA, Iuliano AD, Chisti MJ, Ahmed M, Bhuiyan MU, Hossain K, Haider MS, Aziz SA, Rahman M, Azziz-Baumgartner E. Effectiveness of an educational intervention to improve antibiotic dispensing practices for acute respiratory illness among drug sellers in pharmacies, a pilot study in Bangladesh. BMC Health Serv Res. 2018 Aug 31;18(1):676. doi: 10.1186/s12913-018-3486-y.
[25] Food and Drug Department, Ministry of Health. 2013. Available online: https://www.laotradeportal.gov.la/upload/files/National%20Drug%20Policy%20(Eng).pdf
[26] Hermsen ED, Sibbel RL, Holland S. The Role of Pharmaceutical Companies in Antimicrobial Stewardship: A Case Study. Clin Infect Dis. 2020 Jul 27;71(3):677-681. doi: 10.1093/cid/ciaa053.

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| | monitoring commercial antibiotic marketing and penalizing unethical practices.<br><br>**Facilitate proper antibiotic disposal and waste treatment** at consumption and use levels. Train private providers and other outlets on WHO guidelines on safe disposal of expired antibiotics. Develop and implement a national solid waste policy to address pharmaceutical waste at the household level.[27] Establish take-back programs and designated disposal points in pharmacies and healthcare facilities for unused and/or expired antibiotics. Partner with licensed waste disposal companies to safely handle expired or unused antibiotics. Encourage providers and other outlets to disclose waste management practices through incentives such as certification for meeting environmental standards and penalties such as fines.<br><br>**Monitor supply chain at different stages**: Conduct quality assessments to evaluate drug production, distribution and waste disposal practices Ensure regulatory staff are well-trained on guidelines and policies supporting GMP practices. Assess costs and benefits of establishing and using a digital monitoring system for antibiotic registration and distribution activities. |
| **Test innovative approaches** | **Improve access to rapid diagnostics through private sector:** Train point-of-care providers at the community level, including pharmacists/drug shop operators and community health workers, on the use of quality-assured rapid diagnostic tools and referral to increase the rate of diagnosis before treatment/use of antibiotics. Streamline regulatory approval and registration process for new, rapid diagnostics that meet global quality assurance standards and have potential to reduce the risk of AMR (i.e. new rapid screening tests for infectious diseases). Implement policies that support the integration of screening tests/rapid diagnostics into routine service provision through private as well as public providers at multiple levels including non-hospital outlets.<br><br>**Prepare & deploy awareness raising material for patients on the need for testing** regardless of service location, leveraging trust at the community level in accredited pharmacists and drug shops. This may include targeted posters in private health facilities and drug shops as |

[27] Rogowska, J.; Zimmermann, A. Household Pharmaceutical Waste Disposal as a Global Problem—A Review. Int. J. Environ. Res. Public Health 2022, 19, 15798. https://doi.org/10.3390/ijerph192315798.

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| | well as other mass media to raise awareness about the importance of receiving test results before antibiotic use.<br><br>**Expand immunization coverage through private sector:** Incorporate trained pharmacists and private clinics with capacity to meet vaccination cold chain/storage requirements in national immunization services. Encourage private workplace vaccination programs and employee education campaigns, per lessons learned from global case studies.[28] Resources such as A Guide to Implementing Vaccine Services in Community Pharmacy outlines a business plan for pharmacies in the United States to expand vaccine services and generate revenue, for example. Such resources can be adapted to country-specific needs.<br><br>**Reinforce infection prevention and control (IPC) measures.** IPC interventions are an important component of an overall AMR NAP, as they can limit the spread of infections and the need for AMC/AMU. Ensure that private (and public) providers at all levels of the health system are well trained and equipped to implement internationally recognized IPC guidelines and standards. |

An **enabling regulatory environment** underpins many of the recommended strategies above. As highlighted earlier, input from private sector stakeholders is critical during the formulation of and/or revisions to regulations and policies with respect to AMR. MOHs and regulatory authorities overseeing medicine, vaccine and diagnostic registration are encouraged to look carefully at the extent to which the regulatory framework in a given country context allows for accelerated regulatory reviews of new antibiotics and other products with potential to contribute to AMR NAP and PSE objectives as well as efficient antibiotic supply and safe waste disposal. Furthermore, compliance structures should address incentives and penalties with respect to prescribing and dispensing of antibiotics. Underpinning these strategies are clear monitoring and enforcement protocols with well-trained regulatory staff.

[28] Hermsen ED, Jenkins R, Vlaev I, Iley S, Rajgopal T, Sackier JM, Loubser P, Pronk N, Wilkinson E, Chow Y, Gunther C. The Role of the Private Sector in Advancing Antimicrobial Stewardship: Recommendations from the Global Chief Medical Officers' Network. Popul Health Manag. 2021 Apr;24(2):231-240. doi: 10.1089/pop.2020.0027. Epub 2020 Jul 13.

**PRIVATE SECTOR DATA TOOLS**

A number of tools exist to help MOHs collect, analyze and use data from the private sector relevant to AMR NAPs including:

The Resistance Map - an interactive collection of charts and maps that summarize national and subnational data on AMU and AMR globally - can also be used at the country level to collate and store private sector data through an online repository linked to national AMR surveillance. South Africa and India are examples of countries using the Resistance Map to store and analyze private as well as public sector antimicrobial susceptibility data by collaborating with large private laboratory networks. While Resistance Map can facilitate the aggregation of macro-level analysis, the accuracy and utility of this type of analysis is limited in cases where a relatively small sample of laboratories are reporting; and/or cases where private sector laboratories are unable to submit detailed information needed to differentiate source of infection and/or level of care (i.e., primary, secondary or tertiary).

Antibiotic prescribing audits can be used to assess the extent to which the most effective therapy is being prescribed by private as well as public providers. These types of prescribing audits are designed for easy, periodic repetition. For example, the preferred antibiotics audit tool involves a self-audit of 10 antimicrobial prescriptions, and encourages general practitioners in the private sector to reflect on their prescribing behavior relative to current best-practice guidelines. Results of the prescribing audits (as well as AMC surveys described below) can inform provider training and supervision efforts to improve prescribing and dispensing efforts.

Antibiotic consumption research tools can be used to collect information on the extent to which antibiotics are prescribed and dispensed consistent with local policy guidance, including the extent to which antibiotics are dispensed without prescription. There are a number of ways to do this, each of which come with distinct benefits and considerations. Mystery clients can be used to collect a relatively small sample of prescribing and dispensing audit data from pharmacies and drug shops. In countries where community pharmacies can be engaged through an existing digital network, such as SwipeRx in southeast Asia, a digital or mobile survey can be used to collect a larger sample of information about antibiotic stocking, prescribing and dispensing as well as pharmacy/drug shop staff knowledge and attitudes related to AMR. For more information about digital survey tools used to assess AMC through the pharmacy channel for a fraction of the time and budget required to conduct offline surveys through the pharmacy channel in Asia, see www.swiperx.com.

## V. Developing a Country-Specific PSE Plan

While developing - let alone implementing - a PSE strategy can be daunting for MOH and other government stakeholders responsible for the AMR NAP, the following key steps can be used to approach this task in three key stages:

**Step 1**  Prioritize feasible PSE actions in a specific country context:

1. Organize a review of the PSE framework (4 objectives and strategies) with MOH leadership responsible for the AMR NAP early on in the PSE planning process. Identify a list of 4-6 key stakeholders (based on findings from the landscaping exercise above) relevant to the 4 PSE objectives in your country context to review the framework. For example, the MOH leader/s responsible for the AMR NAP may consider meeting with the WHO AMR focal point as well as a leader from the private doctor/pharmacist associations and the regulatory authority (for medicine and rapid diagnostics) at this initial stage.

2. Collect input from key stakeholders using a locally tailored version of the suggested in-depth-interview (IDI) guide (See Annex I), either on a 1:1 or smaller technical group basis to better understand key perspectives on current PSE priorities in your country context. This step may be conducted before or after step 1, depending on the stakeholder context.

3. Use IDI inputs to complete a rapid review of the extent to which the strategies (by objective) for PSE for AMR are already being utilized in your country context, and to identify priorities for the future. The sample PSE for AMR prioritization table (See Annex II) can be used for this step.

4. Plan a larger group review of the priorities emerging from the PSE for AMR, using the draft PSE for AMR prioritization table as a guide for a country-specific discussion about the priorities that make sense in both near and medium terms to optimally contribute to AMR NAP.

5. Document PSE analysis and commitments in the form of a PSE strategy and/or operational plan, depending on formats needed to optimally integrate with ongoing AMR NAP documentation and tracking tools.

**Step 2**  Identify support needs:

1. Determine the human, financial and tech-related resource gaps needed to support the implementation of PSE strategies prioritized in the country-specific PSE table and resulting plan.
2. Review recent investments in private provider training – at all levels including private hospitals, labs, clinics and pharmacies – to identify investments needed to support capacity building to support PSE for AMR priorities.
3. Identify resource-generating strategies including advocacy for national budget support and external fundraising to implement prioritized strategies and clarify responsibilities and timelines for resource mobilization.
4. Adjust the PSE operational plan to align with secured resources.

**Step 3**  Establish a tracking and reporting framework:

1. Integrate key metrics related to prioritized PSE objectives and strategies into existing AMR NAP monitoring tools.
2. Track and report progress on PSE for AMR to the AMR NAP coordinating body.

## ANNEX I: In-Depth Interview Guide

# In-Depth Interview Guide: Private Sector Engagement for Antimicrobial Resistance National Action Plans

The following is a guide for in-depth interviews (IDI) with key stakeholders to better understand perspectives on private sector engagement (PSE) priorities to address antimicrobial resistance (AMR) within a given country. The questions included in this IDI guide are formulated to help advance the four PSE objectives recommended by WHO's Interagency Coordination Group on Antimicrobial Resistance with respect to a country's AMR National Action Plan. It is envisioned that Ministries of Health (MOHs) will modify this guide for their own country context. To facilitate the use of more tailored questionnaires for specific types of stakeholders, this IDI Guide includes suggested questions for specific types of stakeholders. For more guidance regarding which stakeholders to interview when planning PSE, please consult section 3 of the PSE for AMR Regional Guide. Interviews can be conducted as a 1:1 interview, or as a small group discussion with 2-3 people representing similar perspectives. Interviews can be conducted in-person or virtually.

## AMR Country Context

1. Who are the key stakeholders involved in manufacturing, marketing, distributing, prescribing and dispensing antimicrobials in the country?
2. What are the main factors contributing to misuse of antimicrobials in the country? Which of these involve private sector actors?
3. If we wanted to describe the total "market" for antimicrobials in the country, what are the different types of private providers or outlets where antibiotics can be accessed? (Interviewer can use the table below to document more in-depth analysis by channel if the person being interviewed has detailed information of the AMR context)

| Provider/outlet type | Ranking in terms of volume of antibiotics **prescribed and/or dispensed** through this provider/outlet type (1 highest volume, 5 lowest) | Can antibiotics be accessed over the counter through this provider/outlet type? (Yes/No) |
|---|---|---|
| Private hospital/ pharmacy | | |
| Private clinic | | |

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| Private pharmacy | | |
| Public hospital | | |
| Public health facility (non-hospital) | | |
| Other (i.e. informal drug shops, traditional healers): | | |

4. What are recommended references related to AMR in the country (i.e. does the AMR NAP include a section on PSE)?

## PSE Objectives & Priorities

Consistent with the four PSE objectives outlined in the PSE for AMR Regional Guide, we would like to discuss your thoughts about the following:

**Objective 1: Use private sector data related to AMR, AMC, and AMU**

1. Which private sector providers are already sharing data on AMU, AMC, and AMR with the MOH and others managing national surveillance?
2. Considering the volume of antibiotics provided by provider/outlet (see above), what type of additional data is needed from the private sector to inform a national surveillance system that can be used to support more effective AMR stewardship?
3. What are the challenges to generating and receiving the needed data from the high-volume providers/outlets?

**Objective 2: Facilitate responsible antibiotic dispensing**

1. Considering the volume of antibiotics provided by provider/outlet (see above), what types of private providers should be targeted in the country if there were resources available to pilot innovative approaches to improving antibiotic dispensing practices?
2. What innovative approaches to improving antibiotic dispensing practices would you recommend?

**Objective 3: Ensure ethical supply chain and disposal**

1. Which are the primary companies involved in manufacturing or importing, distributing or marketing antibiotics? Which of these are national vs multinational? Describe the government oversight of these companies. Where are there gaps in oversight?
2. Which actors and policies govern waste management of antibiotics and other medicine? Describe the government oversight of these companies. Where are there gaps in oversight?

**Objective 4: Test innovative approaches**

***I. Rapid diagnostic tools***

1. What types of rapid diagnostics are approved by regulatory authorities and available but not being used widely enough to positively influence resistance in the country? What are the primary reasons for not utilizing rapid diagnostics?
2. What do the current policies state about which type/level of private providers can offer these rapid tests as provider-assisted or self-use?

***II. Immunization coverage***

1. What are the biggest obstacles to routine immunizations among the population?
2. Which private hospitals, clinics, and pharmacies receive and administer vaccines and have resources for cold chain maintenance?
3. Which types of private providers should be targeted in the country if there were resources available to pilot innovative approaches to improving access to and coverage of routine immunizations?
4. What innovative approaches to access and coverage of routine immunizations would you recommend?

## Planning PSE partnerships

1. Which partners are key to informing and supporting a strategy to increase private sector engagement in the country? And why?
2. What are the key policies in place relevant to private provider involvement in prescribing, dispensing of antibiotics, and provision of routine diagnostics & immunizations?
3. What training has been provided by private providers related to AMR in the last 2 years?
4. Which government bodies are key to securing necessary national budget support for PSE priorities? If external funding is needed to complement national budget support, which funders are supporting AMR surveillance and programming in your country context and could be approached to support PSE priorities as needed?
5. What are the gaps in the regulatory environment with respect to PSE in AMR?

## Supplemental questions

**I. Regulatory authority**

1. Can you describe the (relevant regulatory body's) responsibilities overall, and with respect to AMR more specifically?
2. What are the primary constraints to accomplishing those regulatory responsibilities?
3. Can you describe the number and type of antimicrobial medicines registered for sale and use in the country?
4. Can you describe the registration process in terms of requirements, costs and timeline? Does it differ for antibiotics compared to other medicines, or is it the same?

5. How long are drug registrations valid in the country?
6. What types of rapid diagnostics are in the pipeline for approval?

## II. Private pharmacist/doctor association leadership

1. Please describe the responsibilities of the association.
2. Please describe the private pharmacy/clinic/hospital context (i.e. number of retail pharmacies/clinics/hospitals, staffing, and licensing requirements).
3. To what extent have private pharmacy staff or clinic/hospital staff been trained in topics related to AMR? Which topics?
4. To what extent are efforts underway to incentivize appropriate antibiotic prescribing at private health facilities and dispensing at private pharmacies?
5. How has your association been involved in the country's National Action Plan for AMR?
6. What else is needed within the private sector to address AMR?

## ANNEX II: PSE for AMR Prioritization Table

# Private Sector Engagement for Antimicrobial Resistance Prioritization Table

The purpose of this table is to guide Ministries of Health and key partners involved in engaging the private sector to address antimicrobial resistance (AMR) to identify local priorities for private sector engagement (PSE) based on a rapid review of progress to date against key components of the PSE framework developed by SwipeRx with support from the CAPTURA project funded by the Fleming Fund. The key objectives (bold) and accompanying strategies outlined below are consistent with global literature describing effective or promising strategies to increase private sector contributions to AMR National Action Plans (NAP) in low-and-middle-income country contexts. Countries are encouraged to adapt this table as needed for a given country context, for example, selecting and refining objectives and specific strategies based on local needs and feasibility.

### Instructions

1. Review objectives and strategies and adapt to fit your country's context.
2. Use the table in a two-step process. First, for each strategy, mark your current status by placing a checkmark [✔] in one of the following options: i) None: No action has been taken, ii) Partial: Some steps have been initiated but are incomplete, iii) Done: The strategy has been fully implemented.
3. Second, focus on the subset of objectives identified as having "partial" or "none" action taken to date, and identify priority actions needed to move from partial/none to done for any of these objectives identified as critical in your context. Start with priority actions that are feasible in the near-term i.e. next 1-2 years, and then consider medium-term actions if/as needed.
4. Review the full list of priority actions for all objectives not yet fully met (i.e. classified as "done") and adjust as needed to ensure the overall prioritized plan reflects feasible priorities for your context.
5. Develop a cost-estimate for any priority actions not yet funded through national AMR programs or external funding and use these estimates to inform fundraising and advocacy for national budget support.

| PSE Strategies by Objective | Actions Taken to Date | | | Priority Actions | | Estimated Budget Requirement |
|---|---|---|---|---|---|---|
| | None | Partial | Done | Near-term (1-2 years) | Medium-term (3-5 years) | |
| **Objective 1: Use private sector data related to AMR, AMC and AMU to inform PSE** | | | | | | |
| 1.1 Identify types and locations of private providers and channels or health facility/outlet types relevant to AMR/AMC/AMU data collection. | | | | | | |
| 1.2 Develop and use standardized reporting forms on AMR/AMC/AMU data for private and public providers/facilities. | | | | | | |
| 1.3 Collect routine AMR/AMC/AMU data from prioritized private providers/facilities, including private laboratories. | | | | | | |
| 1.4 Analyze collected data to gain insights into AMR/AMC/AMU patterns at multiple levels within the health system, including community. Include analysis from private sector representatives (i.e. private doctor and pharmacy association leaders). | | | | | | |
| 1.5 Facilitate data sharing and interpretation by creating or using digital platforms for real-time data sharing among public and private sectors. | | | | | | |

| PSE Strategies by Objective | Actions Taken to Date | | | Priority Actions | | Estimated Budget Requirement |
|---|---|---|---|---|---|---|
| | None | Partial | Done | Near-term (1-2 years) | Medium-term (3-5 years) | |
| **Objective 2: Facilitate responsible antibiotic prescribing and dispensing** | | | | | | |
| 2.1 Provide pre-service training and/or continuous professional education to private healthcare providers on appropriate antibiotic prescribing, dispensing and counseling practices. | | | | | | |
| 2.2 Use accredited, digital education systems to scale private pharmacy education. | | | | | | |
| 2.3 Prepare and deploy awareness raising material on AMR to private health facilities and drug shops. | | | | | | |
| 2.4 Utilize digital survey tools and/or audits to assess prescribing and dispensing practices. | | | | | | |
| 2.5 Analyze survey and audit findings to tailor trainings with private providers. | | | | | | |
| 2.6 Link adherence to AMR guidelines with accreditation or (re)licensing for healthcare providers and pharmacies. | | | | | | |

| PSE Strategies by Objective | Actions Taken to Date | | | Priority Actions | | Estimated Budget Requirement |
|---|---|---|---|---|---|---|
| | None | Partial | Done | Near-term (1-2 years) | Medium-term (3-5 years) | |
| 2.7 Create incentives for private provider compliance with prescribing and dispensing guidelines. | | | | | | |
| 2.8 Establish disincentives for non-compliant private providers. | | | | | | |
| **Objective 3: Ensure ethical supply chain and disposal** | | | | | | |
| 3.1 Ensure ethical manufacturing and distributing practices are part of national medicine policy. | | | | | | |
| 3.2 Work with regulatory authorities to adopt Good Manufacturing Practices. | | | | | | |
| 3.3 Improve procurement protocols (i.e. establish prequalified suppliers, determine order quantities based on estimated needs, require pre-authorization). | | | | | | |
| 3.4 Design efficient network of secure storage facilities with access to public and private health units, pharmacies and other distributors. | | | | | | |

| PSE Strategies by Objective | Actions Taken to Date | | | Priority Actions | | Estimated Budget Requirement |
|---|---|---|---|---|---|---|
| | None | Partial | Done | Near-term (1-2 years) | Medium-term (3-5 years) | |
| 3.5 Require reliable records of antibiotic stocks and consumption by all distributors. | | | | | | |
| 3.6 Set up a digital monitoring system for antibiotic registration and distribution. | | | | | | |
| 3.7 Mitigate financial incentives linked to antibiotic sales by monitoring commercial antibiotic marketing and penalizing unethical practices. | | | | | | |
| 3.8 Develop and implement a national solid waste policy to address pharmaceutical waste at the household level. | | | | | | |
| 3.9 Train private providers and other outlets on guidelines for safe disposal of expired drugs. | | | | | | |
| 3.10 Establish take-back programs and designated disposal points in pharmacies and healthcare facilities for unused and expired antibiotics. | | | | | | |
| 3.11 Partner with licensed waste disposal companies to safely handle expired or unused antibiotics. | | | | | | |

| PSE Strategies by Objective | Actions Taken to Date | | | Priority Actions | | Estimated Budget Requirement |
|---|---|---|---|---|---|---|
| | None | Partial | Done | Near-term (1-2 years) | Medium-term (3-5 years) | |
| 3.12 Create incentives for private providers and other outlets to disclose waste management practices such as certification for meeting environmental standards and penalties such as fines. | | | | | | |
| 3.13 Train regulatory staff on drug production and waste disposal guidelines and policies. | | | | | | |
| 3.14 Conduct quality assessments to evaluate drug production and waste disposal. | | | | | | |
| 3.15 Assess costs and benefits of establishing and using a digital monitoring system for antibiotic registration and distribution activities. | | | | | | |
| **Objective 4: Test innovative approaches** | | | | | | |
| 4.1 Train point-of-care providers at community level on use of quality-assured rapid diagnostic tools and referral to increase the rate of diagnosis before treatment/use of antibiotics. | | | | | | |
| 4.2 Streamline approval and registration for rapid diagnostics that meet global quality assurance | | | | | | |

| PSE Strategies by Objective | Actions Taken to Date | | | Priority Actions | | Estimated Budget Requirement |
|---|---|---|---|---|---|---|
| | None | Partial | Done | Near-term (1-2 years) | Medium-term (3-5 years) | |
| standards and have potential to reduce the risk of AMR. | | | | | | |
| 4.3 Implement policies to integrate screening tests/rapid diagnostics into routine services by private providers. | | | | | | |
| 4.4 Prepare and deploy educational material for patients in need for testing regardless of service location. | | | | | | |
| 4.5 Incorporate trained pharmacists and equipped private clinics in national immunization services | | | | | | |
| 4.6 Encourage private workplace vaccination programs and employee education campaigns. | | | | | | |
| 4.7 Train private (and public) providers at all levels on internationally recognized infection prevention and control guidelines and standards. | | | | | | |