POLICY BRIEF

# Optimise community antibiotic use to mitigate antibiotic resistance in Egypt

## The growing threat of AMR in Egypt

Antimicrobial resistance (AMR) is a major cause of mortality and disability worldwide, with a particularly heavy burden in low- and middle-income countries (WHO, 2025). Egypt's AMR situation reflects broader regional trends across the Middle East and North Africa, where systemic health, economic, and sociopolitical factors are accelerating the spread of AMR (Mestrovic et al., 2024). Egypt's government is actively working to address this public health threat through its National Action Plan (NAP). Antibiotic use is a key driver of AMR and addressing what happens in the community is paramount, as most antibiotics are used outside hospital settings. Global antibiotic consumption data indicate that Egypt is among the highest-consuming countries worldwide (~50DDD per 1000 inhabitants per day) (WHO 2026) with high levels of community antibiotic use and inappropriate antibiotic prescribing and dispensing practices (WHO Regional Office for the Eastern Mediterranean, 2024; Dooling et al., 2014; Maarouf et al., 2023). By providing new evidence and recommendations from stakeholders, this briefing aims to aid future NAP implementation beyond government health facilities.

### About the research

This policy brief draws on a mixed-methods study conducted in two semi-urban areas (Badr City, Cairo, and El-Fath City, Assiut) that investigated sociocultural drivers of antibiotic use in the community. Participatory mapping with community members in each site was followed by 40 interviews and 4 focus groups (n=34) with local residents, pharmacy staff, and physicians, together with 640 structured observations of antibiotic purchases and 109 exit interviews with customers at retail pharmacies. Findings were analysed to identify key practices, perceptions, and contextual drivers shaping antibiotic use. This study is the first of its kind to gather data on current patterns of antibiotic use directly from prescribers, dispensers and community members concurrently and the first to co-produce recommendations with stakeholders.

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The British Academy

The research team wishes to acknowledge the community organisations, research participants, Ministry of Health and Population and other stakeholders who contributed to the research and policy discussions in Egypt, and financial support from the British Academy.

## Key messages

A coherent policy package combining regulatory, health system, and educational measures rather than isolated interventions is needed to address community-based antibiotic use in Egypt. The priority actions identified from this research are:

1. Strengthen enforcement mechanisms for regulating antibiotic dispensing of broad-spectrum and higher-generation (WHO Watch and Reserve) antibiotics, while improving access to affordable, quality primary healthcare to reduce reliance on non-prescription antibiotic use.
2. Integrate antibiotic prescribing and AMR competencies into physician performance evaluation and continuous professional development, with regularly updated prescribing guidelines and advice for primary care physicians.
3. Mandate standardized clear labelling of all antibiotic medicines by pharmaceutical manufacturers.
4. Initiate multi-stakeholder consultations to assess the feasibility of transitioning to mandatory generic prescribing of antibiotics.
5. Require antibiotic prescriptions to include a documented clinical diagnosis, to improve communication between prescribers and dispensers, support appropriate dispensing, and facilitate monitoring.
6. Create an online antibiotic information-sharing system for prescribers and dispensers, including up-to-date antibiotic guidance, information on available antibiotics, and appropriate alternatives during stockouts.
7. Embed public education on appropriate antibiotic use within existing health and education platforms to support implementation and community acceptance of prescribing and dispensing reforms.

## Research evidence used to develop the key messages

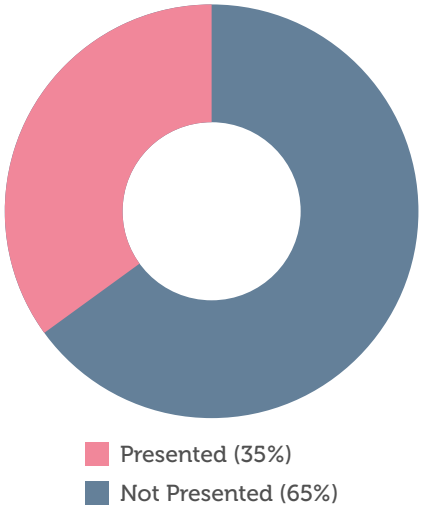
**Pharmacies are the first point of community care, due to access and cost**

Care-seeking is influenced by type, urgency, severity, and timing of health problems, but usually progresses from initial self-treatment at home, to visiting a retail pharmacy for mild or simple conditions, then to seeking medical help at a private clinic or hospital for more serious issues. Members of the public and physicians alike consider pharmacies more convenient, quicker and cheaper than other sources of healthcare. Consultations are available on request and pharmacy staff may help explain prescriptions, interpret lab results, offer substitutes for prescribed medication, and refer customers to doctors. Treatment for most symptoms is dispensed on demand and buying medicines direct, without a prescription, avoids having to pay doctors' consultation fees. Members of the public see physicians as best qualified to diagnose and treat health problems correctly but say government health facilities have limited services of unreliable quality, long waiting times, and may not be located nearby. Private clinics are costly but more accessible. Pharmacists say doctors should be responsible for educating patients about appropriate antibiotic use because they are respected, but doctors find patient education and ensuring treatment adherence challenging.

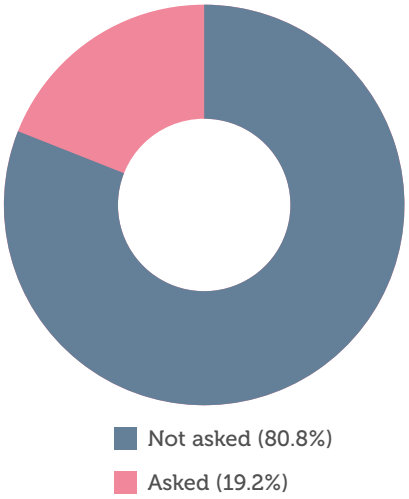
### Antibiotics are routinely dispensed without prescription

Pharmacy clients are rarely asked to provide a prescription when purchasing antibiotics, and most do not present one. Data from 640 direct observations across 7 community pharmacies show that many customers request specific antibiotics by name, suggesting familiarity and prior use, and that almost half of dispensed antibiotics are on WHO Watch or Reserve lists. These should be restricted and used only for specific indications (WHO 2022).

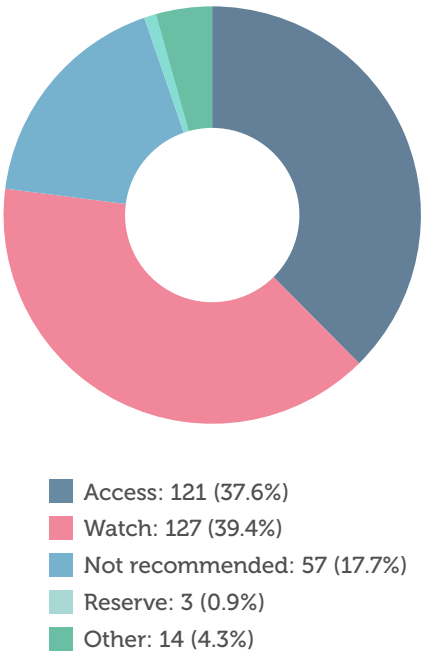
**Did customers present a prescription?**



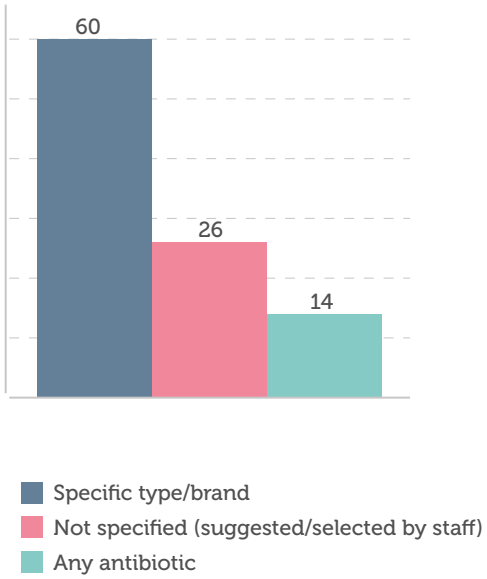

**If not presented, were customers asked for a prescription?**




**AWaRe category distribution, unprescribed antibiotics (n=322)**




**How did customers request antibiotics?**



**Antibiotics are considered powerful medicines with multiple uses**

Antibiotics are seen as the foundation of treatment for many illnesses, including those likely to be viral or self-limiting. They include upper respiratory tract infections, dental problems, gastrointestinal infections and in the management of childhood illness. Members of the public view antibiotics as the strongest, most powerful and fast-acting type of medicine, variously thought to treat inflammation, cough and fever, relieve pain, dry wounds, and kill germs, although some also suggest they weaken children's immunity. Metronidazole (Flagyl) is not recognised as an antibiotic because it is marketed as an 'intestinal antiseptic', so is commonly used to 'cleanse the stomach'. Some people recognise antibiotic side effects and reduced effectiveness with overuse, but resistance is commonly misunderstood as the body becoming resistant rather than the microbes. Injectables and "cold packs" are valued as strong and quick-acting, and cost is associated with quality.

**Diagnostic uncertainty and clinical conventions drive antibiotic prescribing**

Most physicians prescribe antibiotics based on clinical symptoms without laboratory confirmation, driven by time constraints, limited diagnostics, and patient financial barriers. Older antibiotics (e.g., penicillin, amoxicillin, first-generation cephalosporins) are perceived as less effective, prompting a shift toward broader-spectrum options including WHO Watch and Reserve antibiotics. Diagnostic uncertainty, patient demand and resource limitations shape antibiotic prescribing, together with outdated clinical conventions such as: prescribing antibiotics as first line treatment for coughs with yellow phlegm, for infants <6 months with cough or common cold, and for children with high fever; prescribing prophylactic antibiotics to prevent bacterial infection in patients with viral illness; and telling patients that not completing antibiotic courses is the main driver of antibiotic resistance (see Costelloe et al. 2010).

**Commercial pressures influence antibiotic prescribing and dispensing**

Market competition and the need for private sector healthcare facilities to maintain income by meeting patient expectations shape prescribing and dispensing behaviours. Pharmaceutical marketing, brand loyalty, and supply shortages influence which antibiotics are recommended, stocked, or substituted by clinics and pharmacies.

## Co-produced policy recommendations

Research findings were discussed in workshops with local stakeholders (including local pharmacists and residents, community organizers, general practitioners, specialist physicians, and District medical directors) to co-develop policy recommendations. These were reviewed by the research team to identify potential impacts, benefits, and risks and grouped into the following eight policy target areas: regulatory policies for prescribing antibiotics; regulatory policies for dispensing antibiotics; health system policies for antibiotic supply, prescribing, and retailing; health system policies for ensuring the availability of antibiotics; health system policies for care quality; health systems policies for patient access to care and quality improvement; education and information provision to the public; and education and professional development for prescribers. Health officials and national experts including representatives from the Egyptian Drug Authority, the Ministry of Health and Population AMR team, WHO Egypt Country Office, FAO Egypt, the Egyptian Health Council, infection prevention and control specialists, and university academics, were then invited to prioritise these policy targets at a national stakeholder's workshop, according to what is currently most needed to improve antibiotic use in Egypt. Participants were then asked about the feasibility of implementing each component policy in the four highest-ranked target areas. The highest priority, most feasible policies are presented below. The detailed methodology can be found in Annex 1.

The evidence from this project suggests that addressing antibiotic use in the community requires a bundle of mutually reinforcing policies:

## Fig.1 Co-produced recommendations

### Policy interventions to promote responsible antibiotic use and combat antimicrobial resistance

**4 ACTION AREAS**

**01 CONTINUOUS MEDICAL EDUCATION POLICIES**

- Antibiotic prescribing in CME
- Pharmacology integration with clinical practice
- Educational support for family physicians
- Regular updates on antibiotic guidelines
- Mandatory physician competency exams on AMR & antibiotics

**02 PRESCRIBING POLICIES**

- Establish electronic prescribing system
- Include diagnosis on antibiotic prescriptions
- Prescribe antibiotics by generic name

**03 DISPENSING POLICIES**

- Limit dispensing of certain antibiotics without a prescription
- Restrict dispensing of broad-spectrum & higher-generation antibiotics without a prescription

**04 HEALTH SYSTEM POLICIES**

- Create a system to share information about antibiotics with prescribers
- Packaging must clearly state that the product is an antibiotic

## Policies for continuous medical education

National stakeholders prioritised physician education on AMR and antibiotic use as most needed in Egypt, with the following recommendations:

- Mandate periodic competency exams for physicians (including on AMR and antibiotics)
- Introduce continuous professional development in antibiotic prescribing
- Institute regular scientific meetings to update prescribers on new antibiotic guidelines
- Provide educational opportunities to strengthen integration between pharmacology and clinical practices
- Provide high-quality educational opportunities for family physicians to improve service quality

Continuous professional development for physicians will institutionalize ongoing learning, ensuring prescribers have the latest evidence and guidelines to optimise antibiotic prescribing decisions. This would best be done by integrating antimicrobial stewardship into existing professional- and government-approved training platforms and programs. Scientific meetings and other educational opportunities will keep prescribers up to date with antibiotic guidelines, strengthen integration of pharmacological knowledge into clinical practice, support family physicians to improve service quality and increase the appropriateness of real-world prescribing decisions. Mandating periodic competency exams for physicians on AMR and antibiotic use will ensure accountability for evidence-based prescribing.

## Policies for prescribing antibiotics

Education alone is insufficient to change antibiotic use; professional development must be embedded within broader policy changes. The regulatory policies recommended for prescribing antibiotics are:

- Use standardized antibiotic prescription forms and/or electronic system
- Include preliminary or confirmed diagnosis in antibiotic prescription
- Prescribe antibiotics by generic name

Requiring a diagnosis to be stated on all antibiotic prescriptions, potentially through the creation of standardized prescription forms, will help identify the clinical rationale for treatment, improving continuity of care and communication with patients. Introducing an electronic prescription system (including diagnoses) will standardise care across facilities, reduce errors from illegible scripts, strengthen patient trust, support monitoring of antibiotic use and enable evaluation of policy interventions. However, implementation of system-wide electronic prescribing is costly and likely to be gradual (Rodzik et al., 2023). Requiring antibiotics to be prescribed by generic name can reduce financial incentives tied to specific brands and improve affordability, although concerns about brand quality may act as a barrier (Merchant et al., 2022). Ideally generic prescribing would be combined with measures to reduce pharmaceutical company incentives to pharmacies.

## Policies for dispensing antibiotics

Recommendations on regulatory policies for dispensing antibiotics reflect stakeholder preferences for targeted rather than blanket restrictions to improve antibiotic stewardship:

- Limit dispensing of certain antibiotics without a prescription
- Restrict dispensing of broad-spectrum & higher-generation antibiotics without prescription

Access to antibiotics is widely viewed as an essential component of healthcare that should not be denied to those with limited financial resources or restricted access to medical services. Accordingly**, limiting the dispensing of WHO Watch and Reserve category antibiotics without a prescription** is an appropriate and effective way to slow down transmission of AMR (WHO 2022). Existing regulations including the Pharmacy Profession Law (1955) and recent restrictions on Reserve antibiotics (EDA Decision 268/2024) are already in place, but their implementation remains inconsistent. Identifying effective and context-appropriate mechanisms to enforce these existing laws is crucial, alongside measures that improve universal access to affordable medical services.

## Policies for the health system

Health system policies can improve antibiotic use by ensuring that medicines are available when needed, prescribing practices are guided by accurate information, and dispensing processes are consistent and safe. Co-produced recommendations are:

- Create a system to share information about antibiotics with prescribers
- Packaging must clearly state that the product is an antibiotic

An information-sharing system in the form of an online resource that is updated in real time would ensure access to data on available antibiotics, ensure prescriptions match current stock levels and minimize deviations from the original prescription during stockouts. Requiring antibiotic products to be clearly labelled allows patients to identify antibiotics, reduces confusion from ambiguous or misleading marketing terms such as “intestinal antiseptic,” and helps pharmacy staff (including unqualified assistants) to dispense appropriately.

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## Annex A: Project overview and methodology

This project was awarded by the British Academy (grant reference IOCRG\101411) under the International Science Partnerships Fund ODA Challenge-Oriented Research Grants scheme. It was led by Professor Helen Lambert at the University of Bristol, together with co-investigators Prof. Amira Fathy EL-Gazzar (Badr University Cairo), Dr. Mariam Amin ( Assiut University) and Dr. Nour Alhusein (University of Bristol).

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## Co-production of policy recommendations

**Step 1:** Evidence is gathered through qualitative and quantitative research including participatory mapping, in-depth interviews, focus group discussions, observations of and exit interviews with customers buying antibiotics in community pharmacies, and systematic literature and policy reviews.

**Step 2:** Research team analyses the research findings and identifies themes that reflect the main socio-cultural influences on antibiotic use. Each theme is summarised in a poster with illustrative quotes and examples for presentation in the co-production workshops (**Box 1**).

**Box 1: Poster topics summarising research findings**

- Patterns of, and influences on, seeking healthcare
- Role of pharmacies and pharmacy staff
- Role of doctors and medical facilities
- What are antibiotics and what do they do?
- When are antibiotics used?
- How are antibiotics used?
- How community members obtain information on antibiotics
- Commercial and socioeconomic influences on antibiotic use

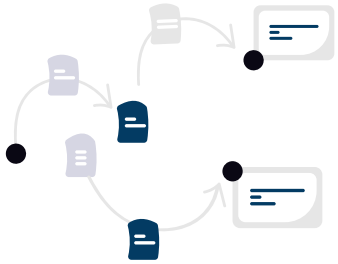
**Step 3:** Co-production workshops are held in Assiut and Badr in which physicians (prescribers), community pharmacists (dispensers) and community members (consumers) review the findings and produce recommendations for optimising antibiotic use in the community.

**Step 4:** Research team categorises the co-produced recommendations into eight policy target areas. Each of these policy areas includes a variable number of specific recommendations. Relevant supporting evidence is identified for each recommendation and their potential benefits and drawbacks assessed.

**Step 5:** A co-production workshop with national AMR stakeholders is convened to review and prioritise the co-produced policy recommendations according to need and feasibility. The content and rationale for each of the eight identified policy target areas are presented and participants are then invited to rank them according to perceived priority using online voting. The four areas given highest priority are 1) regulatory policies for prescribing antibiotics, 2) regulatory policies for dispensing antibiotics, 3) health System policies for antibiotic supply, prescribing, and retailing, 8) education and professional development for prescribers.

**Step 6:** The policy recommendations within each of these four target areas are presented again and workshop participants are invited to vote electronically on the following statement: 'In your opinion, which of these policies are feasible in Egypt?' for each policy in turn.

## Figure 2: Project methodology

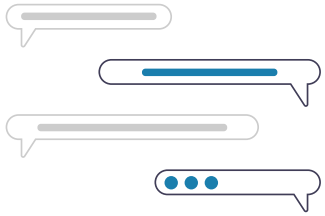


### 1 GATHER EVIDENCE

Collect data through qualitative and quantitative research methods

### 2 IDENTIFY KEY THEMES

Analyse research findings to identify key themes reflecting the main socio-cultural influences on antibiotic use, and summarise these into posters for co-production workshops. Themes include healthcare-seeking behaviours, the roles of pharmacies and healthcare providers, understanding and use of antibiotics, sources of antibiotic information, and the commercial and socioeconomic factors influencing antibiotic use.



### 3 CO-CREATE SOLUTIONS

Discuss thematic summaries with community and expert stakeholers and co-produce recommendations

### 4 DEVELOP POLICY RECOMMENDATIONS

Group the recommendations into eight policy areas and assess the evidence, potential benefits, and possible challenges associated with each.

### 5 PRIORITISE POLICY AREAS

A national AMR stakeholder workshop ranks and prioritizes policy recommendations based on need.

### 6 ASSESS FEASIBILITY

Stakeholders evaluate the feasibility of each policy recommendation within the Egyptian context.