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The Global Fight Against AMR: Why Local Data from the Middle East Matter

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ABSTRACT

Antimicrobial resistance (AMR) is a global issue that needs global efforts. The vast majority of data and evidence used to shape the international policy come from well-developed countries. Consequently, there is a significant gap in data that may represent challenges and barriers for the implementation of effective AMR controlling plan. Insufficient local data on antimicrobial resistance weakens the decisions at the local level and the formulation of strategies for the global containment of the issue. After wars and long terms conflicts, Iraq's health system is shattered and the capacity for surveillance is limited. In addition, political instability makes it difficult to standardize solutions for health issues. Previous reports from Iraq showed that resistance rates in the main pathogens are climbing at an alarming rate. The impact of such an increase, if not tackled, extends beyond the country's borders. In order to combat the issue locally and internationally, the gap of knowledge should be filled. Therefore, we suggest the formation of a data consortium on antimicrobial resistance at the country and the region levels. Such a consortium aimed at not only standardizing the diagnosis and treatment but also facilitating integration of research with surveillance systems and encouraging regional collaboration. The success of such a project is determined by the support of global institutions. Such a support would be like an insurance that the data of each region will be part of the comprehensive and equitable global AMR response.

Keywords: *Antimicrobial resistance, Antibiotics, Middle East, Public Health.*

Introduction

Currently, AMR is an essential issue and one of the utmost public health emergencies, negating decades of progress in the management of infectious diseases [1]. Unless necessary actions and steps are taken, The World Health Organization (WHO) estimates that the world will be heading for a "post-antibiotic

era" in which antibiotics will not be effective in treating many infections [2]. Recent studies from Iraq show a rapidly escalating AMR crisis. In a study conducted in 2024, persistent and widespread multidrug-resistant Gram-negative and Gram-positive pathogens was found [3]. In another study conducted in 2024 in Sulaymaniyah city, it was shown that the presence of multi-drug resistant and pan-drug resistant Pseudomonas aeruginosa isolated from the surfaces of hospitals and equipment, indicating that environmental contamination and the risk of hospital-acquired infection are still prevalent in these areas [4]. In addition, a multicenter study that was conducted between 2013–2022 revealed worrisome increase in the percentage of E. coli isolates resistant to three or more antibiotic classes providing a clear indication of a high multidrug resistance burden [5]. Currently, AMR is at a critical level in Iraq where it is contributing significantly to the increase morbidity and mortality of infectious diseases [6]. In some cases, the inability to treat common pathogens with first-line or even last-resort antibiotics is costing lives every year [6].

Although AMR is a global issue, there is inequity in the efforts and projects combating the issue. Unfortunately, evidence driving policy and surveillance remains unequally derived from high-income nations. Previous studies show that data from many countries including Iraq are sparse and those countries are underrepresented in the global efforts. Such a weak presence of data and projects in such countries is a critical blind spot that compromises local and international responses [5, 6]. Understanding and response to AMR depend on accurate, context-specific information that reflect regional antibiotic use patterns, healthcare infrastructures, and microbial environments.

A Global Crisis through a narrow lens

The vast majority of AMR papers come from Europe, North America, and East Asia. In such territories, there are well-developed surveillance systems such as EARS-Net and CDC's AR Lab Network generate standardized high-quality information [1]. Such generated data and information make a large part of WHO's Global AMR Surveillance System (GLASS) and global treatment guidelines. It is worth mentioning that the lack of data from across the globe is a major weakness and a barrier to the development and implementation of effective AMR control programs.

Examining studies from Middle East show that the patterns of AMR are highly variable. Many antibiotics that are supposed to be our last line of treatment are failing, leaving us unable to effectively treat infections. To exemplify this, the majority of studies from Iraq show that Pseudomonas aeruginosa are frequently present with concurrent quinolone, aminoglycoside, and β-lactam resistance in Iraq. Such a pattern is rarely occurring in Western datasets [7]. Similarly, high rate of pan-drug resistant Acinetobacter baumannii and Klebsiella pneumoniae have been isolated across different Iraqi hospitals [8]. We believe that such patterns are barely materialize in international reports, creating a partial and sometimes inaccurate global picture. Iraq's health sector illustrates the challenges of AMR surveillance in conflict zones. Over-the-counter sales of antibiotics remain common, infection prevention and control measures are inconsistent, and laboratories operate independently with no reporting framework. Despite this, local researchers have generated a growing body of evidence. Recent studies at different cities in Iraq record high levels of multidrug-resistant Pseudomonas aeruginosa, Staphylococcus aureus, and Escherichia coli [5, 9, 10]. The results, although

published, are invisible to international surveillance systems since there is no unified national AMR reporting mechanism in Iraq. The impact is paradoxical: rich local information with low international visibility.

The impact of AMR is beyond health and has substantial impact on the economy of the region. Such an impact is often underestimated. Factors that increase the economic burdens of AMR include longer hospital stays, more ICU care, and costly second-line drugs, which significantly increase treatment expenses [11, 12]. Besides, infection with AMR can cause productivity losses as it may affect young patients at their production life. Global models estimate that AMR could reduce worldwide GDP by up to 3.8% by 2050 and cost US$1–3.4 trillion annually by 2030 through healthcare spending and lost productivity [13, 14]. When these figures are applied to Iraq, the annual loss in this country could be estimated US$10–11 billion, highlighting the financial threat that AMR poses to already strained health systems [15].

Why Local Data Matter

Empirical treatment needs to be based on local susceptibility patterns. In the absence of strong regional data, the clinician has to work with foreign or outdated guidelines, threatening treatment failure and the promotion of resistance. In addition, national antimicrobial stewardship and infection control programs need to be grounded in local drug availability, diagnostic capability, and public behavior. Fetched policies without local data do not succeed. Furthermore, middle Eastern underrepresentation in data perpetuates global inequity in evidence generation. The least contribution to global policy-informing evidence comes from low-resource, high-burden nations. Finally, Resistance is picked up in local surveillance before regional spread. In the absence of such, global awareness comes too late to allow containment. Over the past decades, the use of antibiotics in agriculture has played a major role the development of AMR. This has happened particularly in low- and middle-income countries where there is no strong legislations to regulate the use of such compounds. The use of antibiotics in agriculture is usually of subtherapeutic dose that creates strong selective pressure for resistant bacteria in animals, which can spread to humans through food, the environment, and direct contact [15]. In Iraq, weak legislations, easy access to antibiotics, and limited monitoring of poultry products intensified the issue. Previous study form Iraq showed high Studies from the region show high resistance levels in food-borne pathogens and environmental isolates linked to animal agriculture [16, 17]. In the absence of clear strong plan in Iraq agricultural antibiotics runoff can contaminate soil and water, allowing resistant genes to circulate between human, animal, and environmental reservoirs.

Obstacles to Regional Surveillance

There are various systemic and contextual obstacles that hinder data generation in the Middle East:

1. Broken health systems: Laboratories operate independently without central oversight.
2. Resource constraints: Standard antimicrobial susceptibility testing, electronic systems, and quality control are not available in most centers.
3. Data segregation: Scientific research is rarely integrated with national or WHO surveillance systems.

4. Political and logistically unstable conditions: War, displacement, and fiscal restrictions disrupt frequent reporting.
5. Limited cooperation: Research remains segregated within single institutions with minimal regional collaboration.

Towards a Regional AMR Data Network

This work aims to fill geographical and evidence gap created by the limited and sparse data from the Middle East, particularly Iraq in global AMR surveillance systems. There are many studies about AMR from Iraq and neighboring countries that cover different aspects of the issue including epidemiology and risk factors. Nevertheless, the data are still very fragmented, not published in international platforms and are also excluded from WHO reporting mechanisms. Such underrepresentation of data makes the trends of AMR not visible in the global databases.

In filling this gap, the region needs an umbrella Middle East AMR Data Consortium funded by university and government partnerships. Such a network would:

1. Standardize testing and reporting requirements throughout the labs.
2. Incubate academic publication integration into official surveillance systems.
3. Support regional molecular diagnostics and bioinformatics training.
4. Facilitate open access data sharing and cross-country collaboration.

The Role of Global Partners

Global institutions and journals must catalyze this transition by:

1. Providing regional capacity building programs with support.
2. Awarding micro-grants for local surveillance activities.
3. Developing publication channels for local AMR data in leading journals.
4. Voluntarily acknowledging gaps in global AMR models and WHO reports.

Conclusion

Antimicrobial resistance is a global threat that needs local solutions. The Middle East, underrepresented traditionally in AMR surveillance, cannot be a blind spot for global plans to ignore. Without inclusion of local data, policy will remain disconnected from the reality of antibiotic consumption, healthcare capacity, and development of resistance in the region.

Facilitating local scientists, harmonizing lab procedures, and establishing regional partnerships are important steps toward a truly global AMR response. The global war against resistance will succeed only when data from all regions, the Iraqies and Middle Easterners in our case, become visible, validated, and valued. Containment efforts globally can never be final until every region provides data that are representative of its unique epidemiological context.

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