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Editorial

The Silent Epidemic in the Shadows of War: Urgent Calls for Ceasefire and International Action Against MDROs in Gaza strip (Palestine)

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INTRODUCTION

Antimicrobial resistance (AMR) has emerged as a significant global health challenge, complicating the treatment of diseases that were once easily managed by conventional antibiotics [1]. AMR occurs when microorganisms such as bacteria, viruses, fungi, and parasites evolve to resist the effects of medications, rendering standard treatments ineffective and leading to persistent infections and increased risk of spread to others [1]. Among these, multidrug-resistant organisms (MDROs) are of particular concern [1]. MDROs are pathogens resistant to two or more antibiotics, complicating infection management and treatment strategies [1]. In Gaza Strip (Palestine), this challenge is particularly acute, magnified by unique socio-political problems and a critical healthcare crisis [1, 2]. Since October 2023, public health concerns have worsened due to the ongoing conflict/genocide, which has destroyed all healthcare facilities and introduced new environmental and living challenges that make disease management even more complicated [3].

Pathogens such as Methicillin-resistant Staphylococcus aureus (MRSA), Vancomycin-resistant Enterococci (VRE), and Extended Spectrum Beta-Lactamase (ESBL)-producing bacteria have increasingly proliferated in the area, leading to substantial health challenges [1]. The rise of these MDROs reflects a concerning global trend in AMR, which challenges current therapeutic regimens and complicates the management of clinical infections [1, 2]. Currently, health risks in the Gaza Strip are significantly worsening due to the impacts of war [3].

In addition to interfering with healthcare delivery, the continuing conflict also makes it harder to implement vital health measures and ensure the consistency of public health policies [3]. Blockades and severe limitations have resulted in an extreme scarcity of

medical supplies in the region, due to the complete destruction of the healthcare infrastructure [3]. Moreover, the relocation of the entire population to Rafah has led to an unusual concentration of people in temporary tent settlements, where limited access to sanitation and clean water significantly increases the likelihood of disease spread [4].

Environmental dangers from constant bombardment exacerbate the issues by massively contaminating wounds and respiratory systems with heavy metals and weapon residues [5]. This greatly complicates the management and treatment of infections. In addition, the imminent risk of hunger exacerbates the population's vulnerability to illness, thereby intensifying the severity of the public health crisis [6].

Given the critical conditions in the Gaza Strip, this editorial aimed to (i) highlight the urgent public health challenges posed by the MDROs crisis in the Gaza Strip, exacerbated by ongoing conflict/genocide and displacement, (ii) emphasize the potential for this crisis to escalate into a regional health threat, affecting neighboring countries, and (iii) call for a coordinated international response that mobilizes global health resources and political support to address these issues effectively.

Detailed Analysis of MDROs Proliferation Factors in Gaza

The proliferation of MDROs in the Gaza Strip is significantly influenced by a combination of biological adaptability, disrupted healthcare, and severe living conditions [1, 2]. The genetic adaptability of pathogens like MRSA and ESBL-producing *Escherichia coli* plays a critical role [7]. These bacteria have developed complex mechanisms to resist antibiotics due to clinical and environmental pressures [7]. One major mechanism involves genetic mutations that change drug targets, diminishing the effectiveness of antibiotics. Additionally, these bacteria can transfer resistance genes to other species through horizontal gene transfer. This process allows bacteria to rapidly share resistance traits, enhancing their survival and spreading resistance more widely [7]. These adaptations make it increasingly difficult to treat infections and manage disease outbreaks effectively [7].

The extensive destruction of healthcare facilities disrupts routine medical care and critical public health interventions such as vaccinations and management of chronic diseases [3]. The absence of adequate facilities for diagnosis and isolation allows MDROs to spread unchecked, exacerbated by the high population density in makeshift accommodations in Rafah [4]. Here, displaced populations are crammed into tents and sometimes open streets, where conditions of poor sanitation are rampant and access to clean water is severely limited [6].

Environmental degradation further complicates this crisis. Continuous bombardment has not only physically devastated Gaza Strip and introduced harmful pollutants into the environment [3]. Heavy metals and other toxic substances from military ordnance contaminate the air, water, and soil, directly impacting human health and potentially increasing the virulence and antimicrobial resistance of pathogens [8]. Additionally, the destruction of sanitation infrastructure exacerbates the risk of waterborne diseases, which can become deadly when involving MDROs [7].

Adding to the complexity, the environmental conditions in Rafah pose their own set of challenges [4, 6]. Seasonal variations, with cold, rainy winters and hot summers, bring distinct health risks that can worsen the challenges posed by MDROs [4, 6]. Cold and damp conditions increase the incidence of respiratory infections such as colds, flu, and pneumonia [4, 6]. These infections are particularly dangerous for vulnerable populations with weakened immune systems or chronic conditions, raising the risk of complications and secondary infections from MDROs [4, 6]. Conversely, the summer heat escalates the risk of food spoilage and water contamination, further complicating hygiene efforts and increasing the likelihood of disease transmission. The presence of insects, which can act as vectors for disease, also increases with warmer weather, adding another layer to the public health challenge.

Moreover, the looming threat of famine due to disrupted supply chains weakens the population's overall health and resilience, making them more susceptible to infections [4, 6]. These conditions further intensify the public health crisis and create a breeding ground for the rapid transmission and evolution of MDROs.

Furthermore, the ongoing conflict/genocide stress from continuous relocation, bombardment, the threat of famine, and the grief from the loss of relatives and community members severely impact the population’s

mental and physical health [1]. Chronic stress weakens the immune system, reducing its ability to fight off infections and increasing susceptibility to MDROs. This, coupled with the aforementioned factors intensifies the public health crisis and creates a breeding ground for the rapid transmission and evolution of MDROs.

The interaction of biological adaptability, disrupted healthcare, environmental extremes, and social challenges forms a complex matrix that fuels the MDROs crisis in Gaza. Effective mitigation requires direct medical interventions as well as a strategic focus on enhancing healthcare infrastructure, improving sanitation and living conditions, and ensuring nutritional support to build systemic resilience against ongoing and future challenges.

Regional Threats and Global Implications of the MDROs Crisis in Gaza

The MDRO crisis in Gaza Strip, while a severe local issue, also presents significant global health risks due to the potential for AMR to spread across borders. The displacement of populations, coupled with the collapse of healthcare infrastructure, significantly increases the risk of contagious MDROs reaching neighboring countries and beyond [4, 6]. Such pathogens, resistant to multiple drugs, represent a critical challenge to global health security [7, 8]. This situation requires immediate and coordinated international efforts to prevent the spread and effectively manage the threat posed by these highly contagious resistant organisms. The urgency of addressing both the local and global implications of AMR cannot be overstated.

The proximity of Gaza to other Middle Eastern countries, where similar environmental and political challenges exist, makes it likely that MDROs could find conducive conditions for further spread. For example, refugee camps and densely populated urban areas in neighboring regions could become hotspots for MDROs transmission, mirroring the conditions in Gaza. Such scenarios demand robust surveillance systems, effective public health interventions, and strong cross-border cooperation to prevent a wider outbreak.

Furthermore, the global movement of people and goods means that MDROs can easily cross continents, making the crisis in Gaza a potential starting point for international health emergencies. The coronavirus disease of 2019 (COVID-19) pandemic has already demonstrated how quickly infections can spread globally and the profound impact they can have on health, social, and economic systems worldwide. Therefore, preventing the spread of MDROs from regions like Gaza is not only a regional necessity but also a global imperative.

To address these risks, the first and foremost action required is a total ceasefire. This will facilitate emergency healthcare services and relief operations to reach all affected citizens without hindrance. Stabilizing the region through immediate health interventions is critical to controlling the spread of MDROs and providing a foundation for recovery and rebuilding efforts.

International health organizations, along with local and regional governments, must then prioritize the restoration of healthcare infrastructure in Gaza. Investments are crucial in treating and preventing the spread of AMR as well as in rebuilding the health system to ensure sustainable healthcare delivery. These efforts should be supported by global health security investments, such as funding for AMR research, the development of new antibiotics, and the strengthening of global health surveillance networks.

Moreover, humanitarian aid and infrastructure rebuilding must be coupled with political solutions that address the causes of the crisis. The global community must recognize the urgency of the MDRO crisis in Gaza as a clear call to action. It presents an opportunity to reinforce global health systems, enhance international cooperation, and develop more effective strategies for managing and preventing the spread of infectious diseases.

Conclusion: A Call to Action

The MDRO crisis in Gaza is a dire warning of the broader implications of antimicrobial resistance, exacerbated by conflict and inadequate healthcare infrastructure. It demands a swift, coordinated global response that exceeds immediate medical aid to include long-term, sustainable interventions. Key actions include enforcing a ceasefire to ensure safe delivery of healthcare services, substantial investment in rebuilding Gaza's health system, and international collaboration on surveillance and research to manage and prevent the spread of infections. Beyond emergency measures, it is crucial to address the principal socio-political factors contributing to the health crisis. Only through a comprehensive approach that integrates health, environmental

recovery, and community empowerment can we hope to mitigate the impact of MDROs and prevent future public health crises. International stakeholders must unite in these efforts, recognizing that the health security of one region affects the global community.

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REFERENCES

1. Nimer NA. Nosocomial infection and antibiotic-resistant threat in the Middle East. Infec Drug Resit. 2022:631-9. [PMID: 35241915] [PMCID: PMC8887909] [DOI]
2. Jabbarin H, Nawajah I, Hejaz HA. Knowledge, Attitude, Awareness, and Perceptions among Physicians toward Antibiotic Resistance in Hospitals in South Palestine. Avicenna J Med. 2023;13(01):049-55. [PMID: 36969351] [PMCID: PMC10038744] [DOI]
3. Saad HB, Dergaa I. Public health in peril: assessing the impact of ongoing conflict in Gaza Strip (Palestine) and advocating immediate action to halt atrocities. New Asian Journal of Medicine. 2023;1(2):1-6. [DOI]
4. NPR. Rafah: Gaza's population crowding amid conflict with Israel: NPR; 2024 [Available from: https://www.npr.org/2024/03/15/1233158434/rafah-gaza-population-crowding-israel-hamas
5. Skaik S, Abu-Shaban N, Abu-Shaban N, Barbieri M, Barbieri M, Giani U, et al. Metals detected by ICP/MS in wound tissue of war injuries without fragments in Gaza. BMC Int Health Hum Right. 2010;10(1):17. [PMID: 20579349] [PMCID: PMC2903525] [DOI]
6. Reuters. Gaza: Starving children fill hospital wards as famine looms: Reuters; 2024 [Available from: https://www.reuters.com/default/gaza-starving-children-fill-hospital-wards-famine-looms-2024-03-19/
7. Gajdács M. The Continuing Threat of Methicillin-Resistant Staphylococcus aureus. Antibiotics. 2019;8(2):52. [PMID: 31052511] [PMCID: PMC6627156] [DOI]
8. Ahmadzai MA, Shinwari Q, Al-Rasheed AA, Garba B. Armed conflict and the proliferation of antimicrobial resistance: the situation in war-ravaged Afghanistan. Int J One Heal. 2022;8:43-7. [DOI]