



Review

Antimicrobial resistance in the context of the Syrian conflict: Drivers before and after the onset of conflict and key recommendations



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ABSTRACT

Current evidence describing antimicrobial resistance (AMR) in the context of the Syrian conflict is of poor quality and sparse in nature. This paper explores and reports the major drivers of AMR that were present in Syria pre-conflict and those that have emerged since its onset in March 2011. Drivers that existed before the conflict included a lack of enforcement of existing legislation to regulate over-the-counter antibiotics and notification of communicable diseases. This contributed to a number of drivers of AMR after the onset of conflict, and these were also compounded by the exodus of trained staff, the increase in overcrowding and unsanitary conditions, the increase in injuries, and economic sanctions limiting the availability of required laboratory medical materials and equipment. Addressing AMR in this context requires pragmatic, multifaceted action at the local, regional, and international levels to detect and manage potentially high rates of multidrug-resistant infections. Priorities are (1) the development of a competent surveillance system for hospital-acquired infections, (2) antimicrobial stewardship, and (3) the creation of cost-effective and implementable infection control policies. However, it is only by addressing the conflict and immediate cessation of the targeting of health facilities that the rehabilitation of the health system, which is key to addressing AMR in this context, can progress.

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Introduction

Multilateral action by international health bodies and governments is required to combat the global threat of antimicrobial resistance (AMR). Failing to address issues at the local level can have regional and global implications. The fallout of the Syrian conflict is not restricted to Syria and neighbouring countries: in 2015 alone, 378 000 Syrians entered Europe – roughly one-third of the 1.3 million refugees seeking asylum there (Connor, 2015). The European Centre for Disease Prevention and Control (ECDC) and the World Health Organization (WHO) have stated that the risk of infections resulting from the living conditions that refugees encounter are greater than the risks of them importing infections (WHO, 2017; Brusin et al., 2015; European Centre for Disease Prevention and Control, 2016). Nevertheless, potentially high rates of AMR amongst Syrians require us to address the causes, risks, costs, and future considerations of this challenge both for Syrians living in conflict and for Syrian refugees.

The *Lancet* Series on the promotion of universal access and sustainable effectiveness of antimicrobials in the context of AMR includes policy recommendations for national and regional interventions to combat resistance (Dar et al., 2016). These include infection prevention and control (IPC), surveillance, monitoring, stewardship, and the strengthening of health systems. It highlights the importance of access to effective antimicrobials whilst also ensuring effective stewardship and vaccination as a means of addressing AMR globally. For Syria and other conflict-affected countries to participate in the WHO Global Action Plan (GAP) on AMR, a pragmatic focus on what can be achieved in these countries is required. This is particularly the case in Syria where a comprehensive national action plan to address AMR is currently

unrealistic given the parallel health systems functioning inside its borders.

This article identifies the drivers of AMR that existed before the conflict and those that have occurred since the onset of conflict in March 2011. It also makes recommendations as to how these can be addressed.

Drivers of AMR in the Syrian context

This section examines the potential drivers of AMR in Syria before and after the onset of conflict, highlighting those most relevant to the Syrian context. Figure 1 summarizes the main drivers and their consequences.

Drivers of AMR in the Syrian context: pre-2011

Prior to the conflict, health indices for Syria, a middle-income country, showed many parallels with those of Western countries, such as completion of the epidemiological transition and a life-expectancy in excess of 70 years. In contrast to Western countries, neither microbiology nor infectious diseases were recognized as speciality areas of training, nor were they financially rewarding. Little training was provided beyond medical school; there were few opportunities for continuing medical education. The laboratories established in public hospitals under the Ministry of Health (MoH) and Ministry of Higher Education were variably equipped with manual (Kirby–Bauer) and automated (Phoenix and Vitek) AMR testing. IPC was inadequate, with poor implementation of the National Protocol for Infection Control, and protocols for universal precautions were absent. Efforts towards antimicrobial stewardship are seen in the legislation drawn up by the Syrian Syndicate

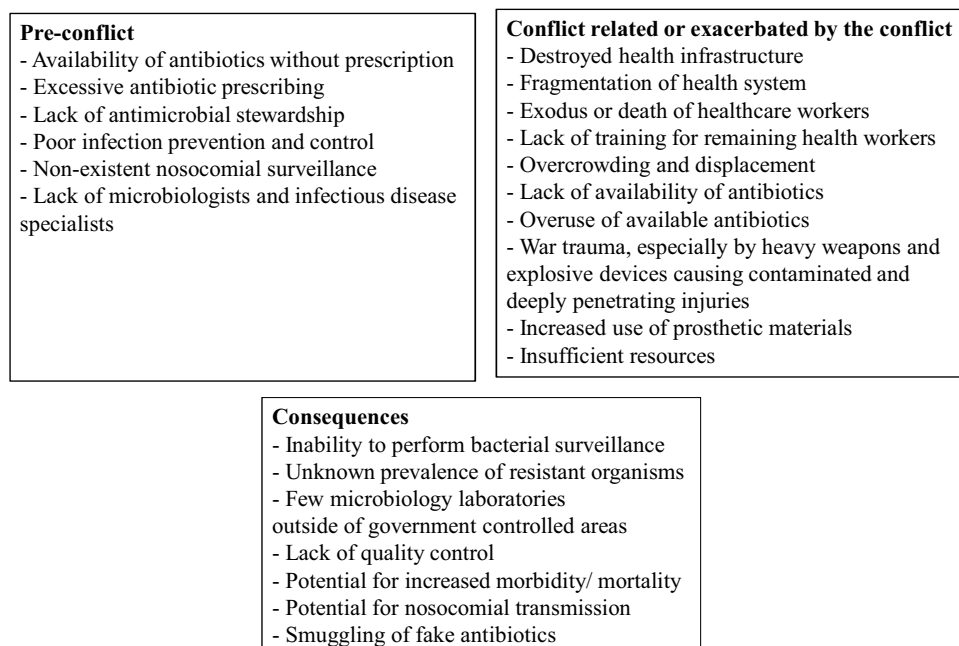


Figure 1. Drivers and consequences of antimicrobial resistance in the Syrian conflict and their consequences.

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