Perspective

Coronavirus 2019 and health systems affected by protracted conflict: The case of Syria

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ABSTRACT

Introduction: Two thirds of countries globally are unprepared to respond to a health emergency as per the International Health Regulations (2005), with conflict-affected countries like Syria being particularly vulnerable. Political influences on outbreak preparedness, response and reporting may also adversely affect control of SARS-CoV-2 in Syria. Syria reported its first case on 22 March 2020; however, concerns were raised that this was delayed and that underreporting continues.
Discussion: Syria's conflict has displaced more than half of its pre-war population, leaving 6.7 million people internally displaced. The consequent overcrowding – with insufficient water, sanitation and healthcare (including laboratory capacity) – could lead to conditions that are ideal for spread of SARS-CoV-2 in Syria. Political changes have led to the formation of at least three health systems within Syria's borders, each with its own governance, capacity and planning. This fragmentation, with little interaction between them, could lead to poor resource allocation and adversely affect control. As such, COVID-19 could overwhelm the health systems (particularly intensive care capacity), leading to high deaths across the population, particularly for the most vulnerable such as detainees.
Conclusions: Locally implementable interventions that rapidly build WASH and health system capacity are required across Syria to ensure early detection and management of COVID-19 cases.

Introduction

Cases of coronavirus disease 2019 (COVID-19) are increasing exponentially, and overwhelming otherwise well-functioning health systems in Europe and North America. These contexts have among the most robust preparedness plans; however, most have been unable to meet the demands placed on their health systems by this pandemic. Globally, one third of countries have capacities to respond to a health emergency in line with International Health Regulations. Conflict-affected countries are disproportionately affected due to the consequences of conflict on their health systems, infrastructure, institutions, economy, and public health, leaving them ill-prepared to manage pandemics such as COVID-19 (Anon., 2019a).

In the Middle East and North Africa region, political instability, lack of transparency and fragmentation along political divisions may affect preparedness. Syria, a country that has now entered the tenth year of a conflict, which has displaced more than half of its population (6.7 million internally and 5.5 million as refugees) is particularly vulnerable as it has a fragmented and increasingly politically influenced health system (Doyle, 2020). This is alongside concern that the presence of high numbers of COVID-19 cases in neighbouring countries, particularly Iran and Turkey, could have introduced cases before Syria declared the closure of its borders on 23 March 2020 (Alber and Mroue, 2020), as some movement continued across less formal borders even after the formal border closures. Turkey is home to around 3.6 million Syrian refugees and is also in the top ten countries with the highest number of COVID-19 cases, with 120,204 confirmed cases (as of 28 April 2020) (Johns Hopkins University, 2020).

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This commentary addresses issues relating to COVID-19 in Syria, including political influences on public health and what measures are being taken to mitigate the potential consequences of COVID-19 spread in a country whose health system has been decimated by years of conflict.

Syria, politics and the SARS-CoV-2 pandemic

Syria's current president inherited his position from his father in 2000. Despite early promise of political reform, when peaceful uprisings began in Syria in March 2011, civilians were violently repressed, leading to one of the most violent and protracted conflicts since the Second World War. More than half a million civilians have been directly killed by the conflict (Abbara et al., 2020; Syria Public Health Network, 2020). This conflict has rendered < 50% of health facilities functional and led to the exodus of nearly 70% of the qualified healthcare workforce, with limited opportunities to sufficiently train new healthcare workers (Kherallah et al., 2012; Adam, 2013). In Syria, even before the onset of conflict, the health system lacked sufficient public health infrastructure with inadequate surveillance or strategic preparedness (Kherallah et al., 2012). Both before and since the onset of conflict, politics has influenced the response to communicable diseases outbreaks, something which contributed to the delayed reporting of the resurgence of polio in Syria in 2013 (Tajaldin et al., 2015). Since then, accusations of interference with humanitarian aid and, consequently, the diagnosis and management of outbreaks have occurred (Haid, 2019).

On 22 March 2020, the Syrian Ministry of Health (MoH) confirmed the first case of COVID-19 in government-controlled areas and has since confirmed 43 cases, including three associated deaths (as of 28 April 2020) (UN OCHA, 2020a). The lack of transparency in Syria has shed doubt on when the Syrian MoH first became aware of cases and whether this was delayed (Mazen and Mehchy, 2020). On 05 March 2020, the World Health Organization (WHO) released a statement refuting claims that were released on social media (attributed to WHO), which reported cases of COVID-19 in Syria (Mazen and Mehchy, 2020). Since then, universities and public institutions have been closed in government-controlled areas and a curfew imposed from 18:00 to 06:00 each day, something that has not occurred since the onset of conflict in March 2011(Table 1) (Anon., 2020). In areas outside of government control, one case (and subsequent fatality) has been reported in the northeast of the country (Syrian Arab Republic, 2020), while no cases have been reported in the northwest (UN OCHA, 2020a; UN OCHA, 2020b). However, suggestions of under-reporting (perhaps related to under-testing) continue.

Despite countries neighbouring Syria declaring cases as early as February 2020, and the governments of Jordan and Lebanon rapidly implementing stay-at-home orders and public health measures, the Syrian MoH continued to deny the presence of any cases (Hill and Al-Hlou, 2020). Iran (a country which shares geopolitical and strategic alliances with Syria) declared its first case on 19 February 2020; however, it has also been accused of delaying and under-reporting. An estimated 22,000 Iranians visit Syria each year on pilgrimage and there are thousands of Iranian militia in Syria (Mazen and Mehchy, 2020). Despite the official declaration of border closures with all neighbouring countries, there are concerns that some crossing points (which are vital for humanitarian aid) (Abbara et al., 2020) remain unmonitored and porous, which could facilitate the spread of SARS-CoV-2.

The political changes that have resulted from the Syrian war and changes to military control have led to the presence of at least three parallel health systems, each with different capacities, preparedness strategies and governance: government-controlled areas make up the largest proportion of the country and are supported by the Syrian MoH and WHO; northeast Syria (NES), which is under de facto Kurdish control; and northwest Syria (NWS), which is under opposition control (under the Syrian National Coalition). These multiple health systems have resulted in an incoherent and fragmented response with different processes for the detection, control and management of cases in place (Mazen and Mehchy, 2020; Anon., 2020).

A focus on northwest Syria, where recent escalation has displaced 1 million civilians

Since 01 December 2019, a further escalation of violence has displaced almost one million Syrian civilians in NWS (where the estimated population is 4.17 million) towards the Syria-Turkish border; 81% of these are women and children (Abbara et al., 2020; Syria Public Health Network, 2020). This has left hundreds of thousands with inadequate food, shelter or health and humanitarian care. All sectors are overwhelmed, with the most acute needs being shelter, WASH (water, sanitation and hygiene), nutrition and protection (UN OCHA, 2020a). Overcrowding is rife: around 327,000 live in tents or camps (which could contain 6-12 individuals), 165,00 are in unfinished buildings, 93,000 are in collective shelters, and 366,00 are living with host families or in rented properties (UN OCHA, 2020a). WASH is insufficient, particularly in camps or collective shelters, making physical distancing measures, frequent hand washing and self-isolation virtually impossible public health measures in these circumstances (Hill and Al-Hlou, 2020). These factors could contribute to a higher R0 (basic reproductive rate) than the 2.2 to 2.7 estimated in non-conflict-affected settings (Sanche et al., 2020).

In NWS, Idlib Health Directorate estimates that there are 98 ventilators for adults (all of which are in use) for the 4.17 million civilians in the area (UN OCHA, 2020a). Even with conservative estimates of numbers of cases, these would be insufficient for the potential needs and the inadequate health system capacity could result in excess mortality should infection spread (Chulov, 2020).

Table 1
The testing and lockdown measures in place in government-controlled areas (GCAs), northwest Syria (NWS) and northeast Syria (NES).

	Testing Capacity	Lockdown measures and Curfews
Government controlled areas	Central Public Health Laboratory in Damascus with plans to establish satellite laboratories in other governorates	14 March 2020: Closure of public and educational institutions. 25 March 2020: Curfew imposed between 1800 and 0600 29 March 2020: Banning of travel between and within governorates 28 April 2020: Businesses and markets could open between 0800 and 1700.
North West Syria	Laboratory in Idlib governorate. Plan to establish two further laboratories to increase capacity to 90 tests per day	15 March 2020: Crossings with government areas and north east Syria closed. Crossings with Turkish controlled areas of northern Syria also closed except for essential medical evacuation, health and humanitarian aid. Educational institutions closed. Mosques were closed but have reopened after demands from extremist groups.
North East Syria	Samples to be sent to government laboratory in Damascus Plan to establish a laboratory in government areas in Qamishli	21 March 2020: Curfew except for health and humanitarian workers, delivery drivers and grocery store staff.

This could be amplified by the insufficient numbers of healthcare workers in general and those with relevant skills (e.g. intensive care, pulmonology, infectious diseases) who can meet the demand, with potential for care of non-COVID-19 conditions suffering. There are estimated to be a total of 4046 healthcare workers in NWS, which includes 358 midwives, 1,693 nurses, 709 community healthcare workers, 1,023 technicians, 263 pharmacists, and 1003 doctors, which falls below WHO-recommended ratios (WHO, 2020).

Surveillance

There are two parallel mechanisms for syndromic surveillance of communicable diseases in Syria. The EWARN (Early Warning and Response Network) was set up by the Assistance Coordination Unit, which forms part of the Syrian National Coalition; it predominantly works in non-government controlled areas. The EWARS (Early Warning and Response System) was established by the Syrian MoH with support and funding from WHO and work predominantly in government-controlled areas (Ismail et al., 2016; Sparrow et al., 2016). These systems report a number of syndromes – including SARS (severe acute respiratory syndrome) and ILI (influenza-like illness), which could act as early indicators for COVID-19. EWARN has been revised to ensure rapid alert verification, triaging and testing of suspected cases (UN OCHA, 2020a).

Capitalising on existing surveillance networks is a potentially effective strategy for early identification of cases and to ensure early testing. However, limitations to the sensitivity of available polymerase chain reaction (PCR) tests, number of tests that can be processed each day, the few numbers of laboratories with the equipment and skilled laboratory technicians required to run the tests could limit the ability to effectively identify cases. In NWS, one laboratory technician (who has been trained in Ankara central reference laboratory in Turkey) has established a laboratory in Idlib city, with plans to establish two further laboratories in Idlib governorate (UN OCHA, 2020a). In GCAs, the WHO has supported the Central Public Health Laboratory in Damascus and provided five PCR machines (with associated testing kits), plans are to establish satellite laboratories in Aleppo, Homs and Lattakia governorates (UN News, 2020). In NES, samples are to be sent to Damascus for testing, where delays to reporting results could delay effective isolation and contact tracing (see Table 1). Across the three areas, there is little ability for prompt testing, contact tracing and isolation of suspected or confirmed cases.

Populations at risk

Among other populations at risk are the elderly, those with comorbidities, those who are immunosuppressed, and possibly those who are pregnant. Nearly 41% of the Syrian population requires treatment for non-communicable diseases and smoking prevalence among Syrian men is 51.3% (Abdulrahim and Jawad, 2018). There are > 90,000 detainees in Syria (Syria Network for Human Rights, 2020) and most are held without charge or have been charged with protesting against the Syrian government or providing healthcare to those opposed to the Syrian government, while others are held by armed forces or militias in NES and NWS (Syria Network for Human Rights, 2020). Syrians in prison are faced with over-crowded, poorly ventilated and unhygienic conditions where torture is prevalent (Syria Network for Human Rights, 2020), healthcare is sparse and malnutrition is rife, which could lead to the rapid spread of SARS-CoV-2 in this population and a high proportion of severe or critical cases (Abbara et al., 2018). The detention centres themselves could act as a reservoir of infection, where staff or visitors entering the centres could import or export SARS-CoV-2.

Meeting the challenge

Internationally recommended measures that could slow transmission, including isolation of cases, self-quarantine, social distancing, and the closures of public institutions (e.g. schools, universities), have been introduced in different countries (Ferguson, 2020). Some of these measures have been introduced in Syria to various degrees and with different levels of success. However, implementing such measures in conflict-affected settings or those with fragile health systems is fraught and could strengthen authoritarian measures, which restrict human rights (Daragahi, 2020). As such, tailored approaches relevant to the local context are important, as some of the internationally introduced measures may be impracticable in low-income or conflict-affected countries such as Syria where various social, economic and political factors have affected society and the health system (Dahab et al., 2020). Local humanitarian organisations have led community hygiene education and disinfection campaigns to support the local communities, which have been effective to an extent.

In Syria, around 80% of the population live in poverty, where food or supplies may be scarce (UNDP, 2020); as such, strict home quarantine measures, which may leave breadwinners unable to work even for relatively short periods, could have severe consequences for the population. In areas outside of government control, such as in NWS, 150,000 hectares of arable land have been unavailable for farming after the arrival of displaced people; this could lead to further food insecurity and starvation (UN OCHA, 2020a). In addition, for those already living in desperation, the threat of COVID-19 could feel distant when daily survival is challenging and they face many threats to their lives.

Researchers estimate that there is capacity to manage a maximum of 6,500 patients across the whole of Syria, although capacity varies greatly across the country; this is based on the estimated number of ventilators across Syria (Mazen and Mehchy, 2020). Measures to upscale and upskill have been slow but are being planned across the three health systems. For example, in NWS, both community and health facility-based isolation approaches are to be introduced. Plans are underway to increase the number of intensive care unit beds (UN OCHA, 2020c) and training has started for 540 healthcare workers across 180 health facilities to ensure that they are up to date with infection prevention and control and patient safety, and to commence training to work in intensive care units (UN OCHA, 2020a). However, these measures may still not meet the potential demand. Other initiatives that support upskilling and skill shifting are urgently required to ensure that the healthcare workforce can meet the challenges of the pandemic (WHO EMRO, 2020).

Although some measures have been taken to identify and meet gaps in the COVID-19 response, shortages in human resources for health, personal protective equipment (PPE), and a lack of effective infection prevention and control measures could adversely affect the remaining healthcare workers. Further losses of healthcare workers as a result of SARS-CoV-2 infection (adding to the more than 923 who have been killed during the conflict) could cause further attrition to the workforce (Physicians for Human Rights, 2019). Healthcare workers at the frontline of healthcare provision in Syria are particularly vulnerable, not only to the risk of transmission but also the ethical challenges posed by the volatile context, including difficult triage and resource allocation decisions due to limited resources, weak governance structures and a hostile environment where healthcare workers may be threatened (Greenberg, 2020; Anon., 2019b; Douedari and Howard, 2019). Mechanisms to support healthcare workers in these contexts are required.

Conclusion

Countries affected by protracted conflict face numerous challenges with health systems that have already been decimated; as such, SARS-CoV-2 could spread rapidly through affected populations, particularly among those in the most vulnerable groups. In Syria, the multiple fragmented and increasingly politicised health systems within its borders present further challenges and the response requires locally appropriate interventions. Internationally recommended measures are unlikely to be enforceable or effective in areas where a lack of sanitation and overcrowding are rife; as such, rapid expansion of WASH and addressing shelter, particularly for internally displaced persons is needed. Ceasefires (as have occurred in Yemen), protection of health workers and health facilities, the expansion of humanitarian access through the remaining border crossings, and evacuation of critical cases for life-saving treatment are practicable measures that can support the response to COVID-19 in Syria.

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