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<https://doi.org/10.1057/s41599-023-01898-2>

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# Health system recovery in Northwest Syria—challenges and operationalization

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The demonstrations in Syria in 2011 became an uncompromising conflict that divided the country into three main areas of control: governmental areas, northeast Syria, and Northwest Syria. A series of United Nations resolutions adopted in 2014 authorizing official cross-border humanitarian aid in opposition-held areas to allow humanitarian agencies and organizations to use routes across the border from neighborhood countries like Turkey to deliver humanitarian assistance to people in need in Syria. The resolution was extended annually until 2021 when it was adapted to involve a cross-line humanitarian response from governmental areas besides cross-border operations. The last adaptation of the cross-border resolution, whose original form was interpreted as a politicized action by Russia and China, implicates an unframed and unplanned transition from an emergency to an Early Recovery status. Without an appropriate framework for the current geopolitical complexity in Syria, Early Recovery programs are doomed to fail, resulting in further complications in the political and humanitarian scenes. Moreover, the effectiveness of the cross-line mechanism is questionable, considering the lack of accessibility and acceptability for Damascus-based humanitarian operations in areas out of government control. The article reviews studies about Early Recovery guidelines and operational frameworks of health systems recovery in post-conflict settings to derive a practical and hybrid framework for operationalizing health system recovery in Northwest Syria, considering current geopolitical and humanitarian circumstances. This article draws upon the six building blocks of the health system, the essential package of public health services, Early Recovery integration criteria, health system resilience dimensions in the literature, and public health determinants to identify context-specific health system recovery challenges and priorities. As a result, we introduce a new health system recovery framework, which is operationalized for the context of Northwest Syria.

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## Introduction

In the first quarter of 2012, the protests that began in 2011 in Syria evolved into one of the most protracted and politically complex conflicts of the last decades (Sajid and Islam Md. Nazmu, 2016). Currently, the powers dominating the political scene in Syria have divided the country into three geographical areas: central, coastal, and southern regions controlled by the Government of Syria (GoS); Northwest Syria (NWS) region controlled by opposition groups and Hay'at Tahrir al-Sham HTS (Al-Nusra Front or Jabhat al-Nusra); and the northeastern region governed by the Syria Democratic Forces (N. J. Saad, 2020). Political changes have resulted in the formation of at least three sub-national health systems, each with its own governance, capacity, financing mechanisms, and planning, and with little or nonexistent interaction between them, which engender severe consequences for the health of the population (Kherallah et al., 2012) (Al-Abdulla and Kallström, 2023). Currently, the health system in the NWS is influenced by several stakeholders, including the Health Cluster in Turkey, Gaziantep, involving humanitarian health organizations, the Turkey Ministry of Health, the Syrian Interim Government (SIG), and local or provincial health directorates, the Syrian Salvation Government (SSG), and other grassroots local actors such as local councils (Abbara et al., 2021).

Repeated attacks on health facilities, the collapse of the governance system, a shortage of medical supplies, geopolitical uncertainty, outbreaks, poor socioeconomic conditions, and the economic collapse and challenges in accessing resources have contributed to a weak health system in the region that has a population of more than 4.5 million people (Fouad et al., 2017) (Kallström et al., 2022) (Al-Abdulla and Alaref, 2022). Responding to the significant needs in NWS, humanitarian organizations mobilized their resources under the coordination mechanism of the United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA) in Gaziantep, southern Turkey, near the Syrian border (Sida et al., 2016). The cross-border mechanism of delivering humanitarian assistance to affected people in areas outside the Syrian government's control, as the only window for humanitarian support, was established in 2014 after the United Nations Security Council Resolution (UNSCR) 2165 (2014) was issued and operationalized through four border crossings from Turkey, Iraq, Jordan, and Lebanon (Abdullah and Baker, 2017) (Will, 2020) (The Carter Center, 2021). The United Nations Security Council (UNSC) adopted this resolution until July 2021, when a new version of the resolution was issued -UNSCR 2585 (2021)- to involve a cross-line humanitarian response from the governmental areas while maintaining cross-border humanitarian operations through one border crossing, Bab Al Hawa, from Turkey (Alkhalil et al., 2022). However, there is precedent evidence of the ineffectiveness of this mechanism in northeast Syria, and it is likely to be ineffective in NWS due to the lack of accessibility and acceptability for Damascus-based humanitarian actors in areas out of the GoS control. This is mainly due to the lack of accessibility and acceptability for Damascus-based humanitarian operations in areas outside the GoS control (Lund, 2021). The last adoption of the resolution indicates the need to transition to a model that relies on cross-line besides cross-border interventions. This Resolution, therefore, has been considered by humanitarian actors and critics as it might lead to an exploitation of the people's needs for political purposes. Furthermore, the resolution places a clear emphasis on accelerating Early Recovery (ER) projects by the GoS and its allies as a condition for renewing the cross-border component of UNSCR 2585 (Hall, 2021).

ER is a comprehensive transition phase that, in conflict settings, usually starts along with decreasing conflict incidents in terms of scale and impact (Peters, 2021). ER phase programs aim to promote individual and communal resilience by capitalizing on

existing emergency programs for a longer-term reinvigoration of the national systems (Fitter et al., 2017). However, the failure to achieve the objectives of ER programs in NWS could be a justification for future objections to the renewal of a cross-border Resolution (Center for Operational Analysis and Research COAR, 2021). This shift from emergency to ER was reflected in the last Syria Cross-border Humanitarian Fund (SCHF) allocations for funding project proposals in November 2021 and April 2022. Through these calls for projects, around 31.8 million USD was allocated to ER programs (OCHA, 2021) (OCHA, 2022). By December 2022, the humanitarian clusters for NWS response developed the inter-agency early recovery strategy and action plan with a total of 92 million USD for the health system recovery. While the plan touched upon actions and objectives, there was no concrete systematic plan for ER on the cluster level. In this regard, it is essential to explore the optimum rationale through a reasonable approach to integrate ER with other clusters, such as health, protection, education and Water, Sanitation, and Hygiene (WaSH), and ensure a systematic transition from emergency to ER, in one of the most complicated humanitarian and geopolitical contexts. The enormous challenge faced by the humanitarian sector, particularly the health sector in NWS, should be carefully considered throughout the planning and implementation phases of ER programs.

The lack of a unified framework for health system recovery can hinder its operationalization. Therefore, integration and unification of the current health system recovery frameworks are necessary to realize its potentials (Foroughi et al., 2022). Hence, we conducted this study to investigate how the conflict influences the context of ER in the health sector in NWS by concluding a comprehensive framework for the health system recovery in post-conflict settings, which we operationalize for the context of NWS in this article. WHO health system building blocks form the core of our framework. The elements of ER-health integration criteria, health system resilience dimensions, Essential Public Health Services (EPHS), and public health determinants were considered in our framework to operationalize it in the context of NWS. This article aims to contribute to the literature on the ER framework, particularly in the case of Syria, which is one of the most complex political and humanitarian emergencies of modern times.

## Methods

The study started with a literature review on ER program sectors, ER guidelines and criteria, and guiding principles and operational frameworks of health systems recovery in post-conflict settings. The research team reviewed several published and peer-reviewed articles on operational ER frameworks in many countries with a comparable emergency context to NWS, conflict setting.

The framework was developed in accordance with the WHO health system building blocks following a three-step approach of anticipating challenges and opportunities related to the health system recovery in general and NWS in particular, identifying priorities of ER, and finally, developing a practical framework of health system recovery in the context of NWS.

Throughout the development of this article, we drew on the authors' hands-on experience and engagement in the emergency and ER response in Syria.

It is worth noting that the Sandai framework was not incorporated in the article as it is more about preparedness for natural disasters than conflicts (Wilkins et al., 2021) (Wei et al., 2021).

## Health systems recovery in conflict settings

Given the recent disruptions to health services globally, the need for resilient health systems is recognized as critical for improving

public health indicators and achieving health outcomes (Karamagi et al., 2022). According to the United Nations (UN) Office for Disaster Risk Reduction, recovery from conflicts could be defined as the process of restoration of the capacity of the government and communities to rebuild and recover from crisis, and the prevention of relapses. ER programs are linked to health system resilience and typically begin during the emergency phase by building upon humanitarian accomplishments to initiate sustainable development activities (Berke, 1995) (Somasundaram and Sivayokan, 2013). Integrating ER programs into health systems in the transition from emergency to ER is essential to achieving ER goals (Bwirire et al., 2022). Health system recovery should aim to rebuild, restore, and improve essential health services, critical public health functions, and health system components, aligned with the principles of rebuilding better and sustainable development (Mortlock et al., 2017). The principal objective of health system recovery is to build upon the existing system and promote it to respond to the health sector's demands and needs, perform its key functions effectively, efficiently, and sustainably, strengthen the system resilience, and mitigate the risk of future health emergencies (Cannedy et al., 2022).

However, post-conflict health system recovery must be framed and contextualized to fit the local context. For example, the WHO building blocks model is general and focuses more on the supply side of the health system and less on the demand side (Mounier-Jack et al., 2014). Elements related to patients' centered approaches should be prioritized in ER health systems, especially with massive displacement contexts, including access, gender, geography, security, and acceptability. On the other hand, community participation should also be ensured in ER health systems (Miller et al., 2018) (Durrance-Bagale et al., 2020). This is especially important in conflict settings where other actors, such as community-based organizations and non-state armed groups, have significant influence (Colona and Jaffe, 2016) (Gilson, 2011).

### Urgency, sustainability, and cost-effectiveness

ER programs should also promote the resilience and protection of local and national capacities from further collapse as a core of the recovery programs (Kruk et al., 2015). ER considerations in humanitarian emergencies have received increased attention since the adoption of the New Way of Working (NWOW) by the UN in 2016 in line with the Sustainable Development Goals (SDGs), the World Humanitarian Summit, and the Agenda for Humanity, calling on humanitarian and development actors to work collaboratively together towards collective outcomes that reduce the needs and the vulnerability of affected population on the long term (Huber and Mach, 2019). In addition, health system recovery must adopt the "build back better" principle, which entails rebuilding the health system in a more advanced manner than before the emergency (Khan et al., 2018). To that end, three determinants should be considered to initiate a transition from a solely humanitarian response to the ER phase: urgency, sustainability, and cost-effectiveness of ER programs (de Goyet, 2012). The urgency aspect reflects the nature of life-saving interventions needed during the humanitarian phase, protection needs during ER, and continuously growing demands in the long term (Kifle et al., 2011). The sustainability criterion reflects the need for better strategies for resource allocation to respond to humanitarian and ER needs in a manner that contributes to long-term planning during the development phase (Maier, 2010). The cost-effectiveness criterion indicates the importance of implementing the last two criteria in a cost-efficient manner. In other words, focusing on recovery and development should not divert resources from emergency and ER to development but rather address both simultaneously (Manis, 2018).

### Operationalizing health system recovery

**Challenges to operationalizing health system recovery after emergencies.** The transition from protracted emergency settings (manmade catastrophes, such as wars) to ER is more complex than short-term (natural) disasters (Albala-Bertrand, 2000). Humanitarian organizations usually take partial or complete roles in running healthcare services and supporting the health system during emergencies. In protracted crises, the NGOs' roles extend more thoroughly to supplanting the functions and responsibilities of a dilapidated or absent government, resulting in fragmentation, uneven distribution, and overlapping health services. During the transition period from emergency states to ER, humanitarian organizations face the uncertainty of their roles and obligations when considering the unpredictable political future in cases of conflicts, the absence of national strategies, and, most importantly, the changes or shortage in donors' financial resources (IASC, 2008). Furthermore, the NGO-led interventions during prolonged crises fixated on the micro-level to produce an expansion of service delivery in the short term and ignore the ER elements of the humanitarian response (Deely 2005). Variations in the objectives, visions, and principles of humanitarian and developmental actors are fundamental challenges in operationalizing ER and development programs (Hinds, 2015).

The politicization of humanitarian funds and aid, security concerns, counter-terrorism, and a high diversity of humanitarian actors are additional challenges for humanitarians and the health system when creating a systematic and planned transition from emergency states to ER. The politicization of aid, primarily due to government intervention, exploitation of humanitarian assistance, and the needs of affected people (predominantly in conflict settings), prevents humanitarian organizations from adhering to humanitarian principles, particularly independence. A report on challenges to humanitarian action principles from four emergency-affected countries (i.e., Colombia, Nepal, northern Syria, and South Sudan) found that politically-motivated donor policies, counter-terrorism measures, urging the transition to ER, and development phases have a significant impact on the humanitarian organizations' ability to adhere to the independence principle (Norwegian Refugee Council and Handicap and International, 2016).

Although system strengthening and resilience are issues that should not be postponed until there is a peace agreement and stable government in conflict-affected states (Griekspoor, 2016), many authors have demonstrated that political stability was one of the most critical conditions for initiating ER programs in multiple contexts like in Bosnia and Herzegovina, El Salvador, and Sierra Leone. The cases of Rwanda and Somalia provided clear evidence that ER programs are futile without a stable political environment (Stoddard, 2021) (Ohiorhenuan, 2011) (Swain, 2015). In the case of intrastate wars like Syria, a rigorously structured approach to political stability is necessary to trigger reconstruction and ER plans (Filipov and Division, 2006).

Armed conflicts and unstable sociopolitical contexts can severely impede people's access to health services (Emberti Gialloreti et al., 2020). Kentoffio et al. argued that access of the remote population to basic healthcare services was a hindering challenge to a successful post-war health system reconstruction in Liberia (Kentoffio et al., 2016). Knox discussed the lack of access to knowledge among young women, a vulnerable group, in post-conflict settings and how beliefs and attitudes are related to the residency settings, gender, and socioeconomic factors (Knox, 2017). In fact, the literature on health system recovery in post-conflict settings lacks consideration of gender issues, according to a literature review by Percival et al. The authors provided evidence of gender inequality as a challenge to gender-sensitive health system reforms (Percival et al., 2014).

**Post-conflict health system recovery framework.** Studies on resilience and recovery in health systems are very recent, especially since the 2014 Ebola outbreak in West Africa (Wilhelm and Helleringer, 2019) (Ribacke et al., 2016). There is an inconsistency globally in applying a unified framework of health systems recovery. Several frameworks have been employed by researchers in multiple emergency contexts (Turenne et al., 2019). Not adopting a unified framework for health system recovery may impede its operationalization (Berg et al., 2018). Frameworks for characterizing postconflict recovery processes are based on the assumption that development aid and humanitarian aid are conceptually distinct. While the latter seeks to save lives, the former seeks to build states as well as their governance and service delivery structures. Recovery must strike a balance between humanitarian aid and development, attempting to lay the groundwork for a long-term framework for service delivery while responding to urgent unmet needs that persist after the crisis (Macrae, 2001).

United Nations Development Program (UNDP) highlights global criteria for integrating ER into other sectors. The UNDP framework divides the joint ER-health programs into four sectors and activities (Table 1), along with six criteria for the horizontal integration of ER programs into other sectors (Table 2) (Meritens et al., 2016) (Obrist et al., 2007).

A framework for operationalizing health system recovery after emergencies was developed by WHO recently in 2020. The framework sets six essential steps in the recovery process, starting with Advanced Recovery Preparedness (ARP). The recovery process of the WHO 2020 framework may be stopped at any step, particularly in protracted and complex emergency settings. In such circumstances, regardless of the point at which the process stops, it is critical that triggering the recovery process again begins with the ARP step. (World Health Organization WHO, 2020).

After a major earthquake and cholera outbreak, a health system recovery framework in Haiti was implemented by the Haitian Ministry of Public Health and Population, WHO, Pan American Health Organization, the U.S. government, and other humanitarian actors based on the EPHS, counting country-specific public health determinants such as socioeconomic conditions, governance, and political climate. In the case of Haiti, it was evident that

the movement between relief, recovery, and development is fluid, where emergency incidents may reoccur. The ER response was composed of three core phases; assessment, policy development, and assurance, emphasizing EPHS restoring to address the public health determinants and restore the health system (Fitter et al., 2017) (Coles and Zhuang, 2020). In contrast, the ER process in Honduras after Mitch Hurricane in 1998, a natural disaster, was unsystematic, and a policy of 'all aid is welcome' was adopted (Gómez, 2019). The recovery was, therefore, driven extensively by offered aid leading to a supply-driven recovery rather than a demand-driven process. This approach, the supply-driven recovery, besides the absence of transition criteria between emergency, ER, and development, resulted in a blurry framework for the recovery process and unclear integration between emergency and ER programs (Costea and Felicio, 2005). According to the case study report of Honduras, it was found that existing local development plans should form a basis for post-disaster recovery activities. Socioeconomic and cultural changes require a long-term developmental process due to the fragile context. The report concluded that donor coordination and flexibility are critical to support the ER plans. Additionally, joint national and international consortia are one of the success factors in achieving ER objectives (Telford et al., 2004). Kruk et al. discussed rebuilding health systems in post-conflict countries on the basis of WHO health system building blocks to improve public health outcomes. The authors proposed a logic model outlining potential mechanisms of health system recovery and roles. The recovery mechanism focuses on supporting a functioning and equitable health system through the six building blocks to improve access to health services and address public health determinants. As a result, this mechanism will lead to reducing mortality and morbidity rates and strengthening community resilience. The framework reflects the current consensus that health systems should aim to improve individual and communal health while also responding to people's expectations (respectful treatment, short waits, quality of care, and equity in health care) (Kruk et al., 2010). To evaluate the post-conflict ER in South Sudan, Cometto et al. employed the WHO's health system model and the four functions of the health system (stewardship, financing, generation of resources, and service provision) along with a deep analysis of the context,

**Table 1 Sectors of early recovery programs, adapted (Clark, 2014) (Daly et al., 2020).**

-Program 1: Livelihoods, including: -Government employment; -Cash and vouchers for services and food (preventing and responding to malnutrition); -Activities aim to enhance the socioeconomic status of marginalized and vulnerable groups to improve equitable access to healthcare. -Program 3: Governance, including: -Supporting local and national; governance structures (i.e., national strategies).	-Program 2: Basic infrastructure repairs and rehabilitation, including: -The rehabilitation of health facilities.  -Program 4: Capacity-building and investing in human resources, including: -Medical education; -Community health workers' capacity-building.
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**Table 2 Global cluster criteria for integrating early recovery with other sectors (Obrist et al. 2007).**

-Life-Sustaining: -Does the program help sustain the lives that were saved? -Facilitating the delivery of relief assistance -Does the program help facilitate the delivery of relief assistance?	-Time Critical -Is the project implemented alongside relief interventions?  -Strengthening National and Local Capacity to take charge of the Recovery Process -Does the program aim to strengthen the existing national and local governance structure to coordinate and lead the early recovery programs and plan for full recovery?	-Bridge between Emergency (Relief) and Recovery -Does the project link the emergency program objectives with long-term recovery objectives? -Reducing dependence on relief assistance -Does the project support the resilience of communities and help restore livelihood, community infrastructure, and basic services?
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humanitarian actors, and public health determinants. The authors found that the recovery process in South Sudan was very slow during the first three years of transition, mainly due to the limited capacity of the Ministry of Health. The study confirmed the importance of supporting local authorities to advance the recovery process (Cometto et al., 2010) (Borghi and Brown, 2022) (Arteaga, 2014). Foroughi et al. conducted a systematic review of 43 articles on health system resilience. The study has identified five main themes which constitute different health resilience framework dimensions; health system resilience phases (anticipation of challenges and vulnerabilities, preparation and capacity promotion, response in line with the health system building blocks, recovery, and growth), attributes (coordination, access, and capacity), leading strategies, health system resilience tools (information system, monitoring, and planning), and relationships with health system building blocks, based on which the authors have developed a synthetic model of health system resiliency analysis (Foroughi et al., 2022).

In this article, we develop a hybrid recovery framework of the WHO health system model, the five health system resilience dimensions, and country-specific EPHS for the context of NWS taking into account the public health determinants that might hinder or contribute to the recovery of the health system.

### **Health system recovery: the case of Northwest Syria**

**Health system recovery in Northwest Syria: challenges.** Considering challenges in operationalizing health system recovery is crucial before setting the contextualized recovery framework (Turenne et al., 2019). Based on available data and the authors' observations and experiences working in the health sector in NWS, we present the main potential obstacles to integrating ER into the health system in this region, considering the geopolitical and humanitarian conditions of NWS.

The unpredictable and unstable political situation is an inevitable challenge when developing and implementing a comprehensive multi-sectoral ER program (Demir and Rijnoveanu, 2013) (Hemsley and Achilles, 2019). Uncertain political and military conditions might lead to a waste of resources and distractions regarding the shift from an emergency state to ER (Seybolt, 2007). The current political situation in Syria is characterized by myriad uncertainties, including the political influence on the humanitarian operations, the future of the multiple military power, economic status, the absence of legitimate government, weak resilience of affected communities, and dependence on the humanitarian fund (Alim, 2022) (Alhaffar et al., 2022) (Ferris and Kirişçi, 2016), meaning that the transition from emergency to ER is at risk of being derailed. ER programs in the NWS should seriously consider the geopolitics of the Syrian conflict when developing a multi-sectoral ER plan. The current delicate balance between the local, regional, and international powers involved in the conflict in NWS should be carefully considered to ensure any proposed health ER interventions are an entry into peacebuilding rather than provoking more tension. Security concerns should be precisely estimated and explored to identify the safest and most appropriate channels for supporting people in need. Security concerns in conflict settings should not be the non-negotiable reason for suspending or terminating humanitarian and ER programs. Donors and stakeholders must strengthen the institutional capacity of the local health directorates in NWS to ensure their neutrality as mere technical entities to allow humanitarian actors to cooperate with them without engaging in the political aspects of the crisis.

Additionally, one of the most critical challenges to achieving comprehensive integration and implementation of ER and health programs in the NWS is the absence of a legitimate government.

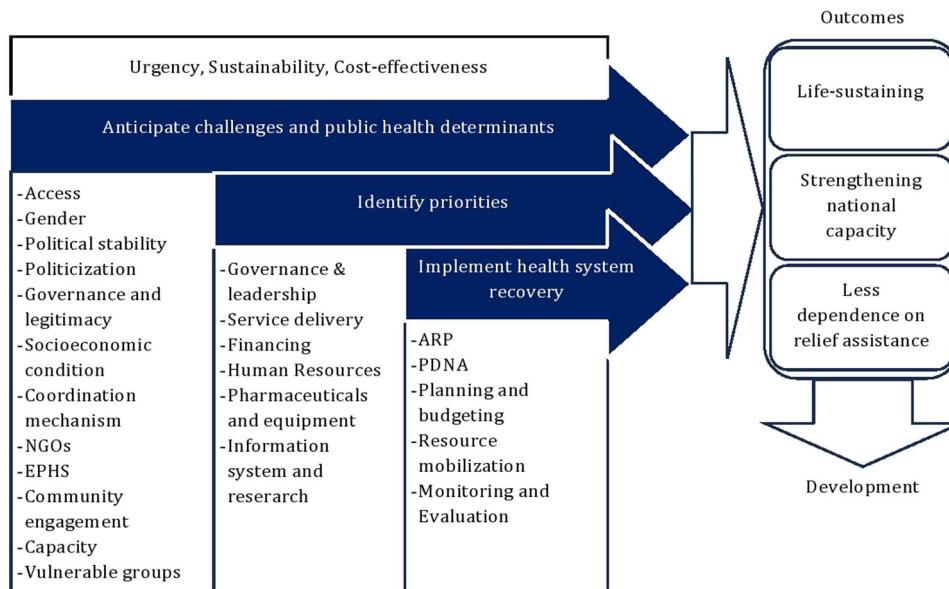
It has been evidenced that supporting local governance structures and essential services is considered to be among the durable strategies for ER programs in post-conflict settings (Brinkerhoff, 2005) (Cuthill and Fien, 2005) (Edwards et al., 2015). Although the SIG was established to replace the Syrian government in opposition-controlled areas (Rangwala, 2014), many donors and stakeholders are hesitant to directly support or collaborate with the governance structures of SIG due to the lack of international legitimacy and geopolitical overlap with other governments, especially SSG, which is considered a terrorist body because of its affiliation with Jabhat al-Nusra or al-Qaeda (Beaujouan et al., 2021) (Drevon and Haenni, 2022).

Problematically, the absence of a legitimate government in NWS might therefore result in expanded roles and duties of NGOs to support the health system the way it happened in other contexts of governmental absence or shortcomings like in Liberia, Afghanistan, Haiti, and the Philippines (Glassman et al., 2012) (Santiago et al., 2016). Nonetheless, ER programs are required that are able to bridge the gap between humanitarian emergency responses, relief, and long-term sustainable development (Lanzer, 2015). Resources channeled to support ER programs in Syria must be utilized to achieve ER strategic objectives using proper methods, including feasible activities, timeframes, and indicators. The development of integrated programs between health and the ER should involve all relevant stakeholders.

### **Health system recovery in Northwest Syria: framework and priorities.**

The proposed framework methodology is based on identifying the expected challenges of the ER plan for the health system and then setting priorities according to the health system's building blocks. Afterward, the implementation of the recovery plan should be initiated by a coordination committee of the humanitarian clusters, local governmental bodies, stakeholders, and active NGOs, taking into account the determinants of public health in the target context. Our framework is in line with the global definition of ER and health systems resilience dimensions. It falls within the NWOW elements and considers essential contextual challenges, including access, gender, political stability, politicization, governance, socioeconomics, coordination mechanism, humanitarian NGOs, EPHS, community engagement, existing capacity, and vulnerable groups. Additionally, it sets the ER Global Cluster criteria for integrating ER as transitional objectives toward system development (Fig. 1).

The framework to operationalize the ER-health program should be adapted to the context of NWS, considering global guidelines, the capacity of the various health actors, and available resources. This process should build on best practices developed throughout the health response in the last ten years, invest in local resources and capacities, and ensure local leadership and ownership. We present in this section some of the priorities that could guide the development of a framework to operationalize the ER-health system in NWS. While a legitimate government does not exist in the NWS, supporting alternative governance structures, like local health directorates, is crucial for initiating an ER program. The role of alternative governmental bodies should be limited to coordinating responses in the field and handing the role over to a formal government after laying the foundation for stabilized conditions in Syria. On the other hand, the classification of governmental or non-state structures as terrorist groups significantly impacts the humanitarian work environment (Schellhammer, 2021). The presence of multiple governmental bodies (some of which are classified as terrorist groups, such as the SSG (was the reason for removing humanitarian and stabilization funds from the areas controlled



**Fig. 1 Al-Abdulla et al. Health system recovery framework during protracted conflicts.** The framework consists of three linear phases that must lead to the standard mid-term objective of the health system recovery, and finally to the long-term objective of the health system development.

by these governments (Crisis Group, 2020). Therefore, depoliticizing humanitarian funds to ensure the safe and appropriate channeling of required resources to support the ER plan was one of the crucial elements during this phase in NWS.

The ongoing conflict in Syria has led to a remarkable decline in available medicines, medical devices and equipment, and human resources (Hamada, 2014). Therefore, access to treatment for non-communicable diseases is a top priority of the humanitarian health response in Syria (Leyh and Gispén, 2018). However, access to healthcare services is hindered by multiple factors, including shortages in medical supplies, poverty, and deteriorated socio-economic conditions (Saleh and Fouad, 2022) (Fouad et al., 2022) (Ibrahim, 2022). Several studies have substantiated how out-of-pocket payments exaggerate the impact of these factors in increasing financial risks associated with health (Onwujekwe et al. 2010) (Laokri et al., 2018) (Chaudhuri and Roy, 2008). Several authors have found that cash transfer programs contributed to overcoming inequity and promoting health security in the context of the Syrian crisis (Falb and Annan, 2021) (Acara and Özdemir, 2022) (Salti et al., 2022). A report from Gaza Stripe concluded that cash assistance is associated with improving social security and cohesion (S. Saad et al., 2022). Moreover, cash programs might complement the emergency response for the quality of care and service delivery in a sector where finding professional medical staff is challenging as most of them have left the country due to the crisis (Tao et al., 2013) (Beaulieu and Horrigan, 2005) (Kallström et al., 2021). Thus, supporting long-term medical education and specialty programs will revive the disrupted high-education system (Bdaiwi et al., 2020) and allow the health system to rapidly overcome the shortage of skilled medical workers and enhance healthcare services. Health education has been interrupted entirely in NWS since the conflict started. One of the critical interventions in the ER phase should be supporting medical education initiatives for health workers who could not complete their education because of the war in order to engage them in the health system recovery.

The conflict resulted in a collapse of HIS, including morbidity and mortality data, information about health facilities, and HR. To support HIS after a crisis, one should focus predominantly on collecting baseline data on the different blocks of the health system. Precise data about health facilities, HR, availability of pharmaceuticals, and public health indicators should be collected

to enable the HIS to produce evidence-based information for decision-makers (IASC, 2008). The HIS has a decisive role in identifying the EPHS based on the top morbidities and mortalities in the country (Rodrigues, 2000). Recognizing the obstacles facing the HIS and the limitations of data, there is a definite must to promote methods for researching conflict public health indicators, including developing better estimates of morbidity and mortality (Abouzeid et al., 2021).

The focus of ER programs is to strengthen the system of primary healthcare to support life-sustaining health services, including prevention, health promotion, physical rehabilitation, and mental health (Howard et al., 2012). The fundamental core value of developing ER service delivery plans is to involve the target population and ensure safe access to healthcare services (Rass et al., 2020). Besides the EPHS for NWS, specific fields of specialized healthcare should also be prioritized (IASC, 2008) (the essential public health services checklist by the level of care and health domain for ER-health programs can be found as Supplementary Table S1 online). ARP should reveal information about the essential package of public health services that must be prioritized during the ER phase of the NWS. The coordination team of ER programs must prioritize programs based on technical feedback and available resources.

ARP: This step in NWS can start with updating the available multi-sectoral assessments (OCHA, 2019) that are part of the humanitarian response through collective exercises, including not only health actors but also other actors such as education, WaSH, and Food Security and Livelihood. The findings will improve the health actors' understanding of the baseline of the health system as well as the other determinants of health. In parallel with this assessment, the following steps can be taken.

- i. Identify context-specific challenges that might hinder the health system's recovery.
- ii. Establish a coordination mechanism: Such a platform can be a transformation of the current active health cluster by ensuring better local leadership. This can be done by giving more leadership roles to the health directorates as well as the SIG. Other coordination platforms, such as the NGO forum and the Syrian NGOs Alliance, and active NGOs in the humanitarian clusters must be involved.

- iii. Build the institutional capacity: There should be a focus on investing available capacities in the health actors in NWS and strengthening this capacity further with a focus on local actors with the scalable capacity (localization) to take more leading roles in the health system. Building the institutional capacity will allow various health actors to be involved in ER planning and implementation. Besides, building the capacity of the provincial health directorates is critical in this regard, not only to contribute to the ER planning but also to be responsible for the handover process to the legitimate governmental bodies in the post-conflict phase and for ensuring that these bodies are neutral and depoliticized to dispel concerns of humanitarian actors about engaging with de-facto governance bodies that are not classified as terrorist organizations.
  - iv. Information management and communication: the roles and responsibilities of the partners and actors engaged in the ER phase must be defined and stated. All the actors should have access to the information related to ER plans and activities in a formal and legalized manner. The current HIS unit in Gaziantep that initiated the use of the District Health Information System (DHIS) in NWS can be used as a starting point for such a process. Existing information systems that various health actors developed should be assessed to explore integration and scalability potentials.
  - v. EPHS: a list of essential public health services should be concluded and integrated into the planning and recovery process.
- Health system recovery assessment: Following an initial assessment in the previous step, a more holistic and comprehensive post-disaster needs assessment (PDNA) should be conducted in NWS. PDNA should be administered for each of the health system's building blocks and the demand side of the system (health-seeking behavior, community engagement, accountability). In addition, the PDNA should cover health determinants, stakeholder mapping, and possible entry points for developing health policies (Analytical matrix for the health system Post-Disaster Needs Assessment PDNA and recovery framework can be found as Supplementary Table S2 online).
  - Health system recovery budgeting: This budgeting process in NWS could take a hybrid approach between top-down and bottom-up strategies. However, the top-down approach is the best choice considering the fragmentation of the health system in Syria, the absence of a solo government, and the lack of data to inform granular details in planning. Accordingly, the planning can rely on estimates of expenditure on health systems in other countries and dedicate the necessary budget toward the recovery plan of the health system in NWS. At the same time, by investing some of the good practices in the health system in NWS, a parallel bottom-up approach can be initiated. In this approach, functioning health facilities in NWS can be involved by providing their estimates of running costs and long-term strategies. Applying any approach must be accompanied by a systematic engagement of the communities, which could be organized through the involvement of the provincial health directorates as local leaders and intermediaries.
  - Resource mobilization: Considering the enormous and severe impact of the brutal conflict on the health system in NWS, the health resources, including infrastructure and health workforces, were severely affected. Careful considerations of health workforce incentives, mental health, training, education, and protection should be key in resourcing the ER health system. However, resource mobilization in NWS should be preceded by supporting stable regional health governance even before a final political settlement. There have been examples where international donors engaged with the provincial health directorates through intermediary NGOs. Such models can be strengthened until a political settlement is reached in the region when the legitimate government would be involved in leading the process.
  - Monitoring and evaluation: During the last ten years, there have been emerging forms of governance systems in local communities in NWS, such as local councils, elected municipalities, and health committees. These structures should be involved in monitoring any recovery interventions acting as communication channels between communities and the ER health system.

### Data availability

The datasets generated during and/or analyzed during the current study are available in the Dataverse repository: <https://doi.org/10.7910/DVN/VV9JXS>

Received: 23 September 2022; Accepted: 29 June 2023;

Published online: 10 July 2023

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## Acknowledgements

This research was undertaken in cooperation with the Strategic Research Center Öz SRC —Turkey, Gaziantep.

## Author contributions

OA: conceptualization, methodology, original draft preparation, investigation, writing, and resources. AE: resources, writing, and review. AK: methodology, writing, and review. CV: review and supervision. MA: writing and review. JK: review, supervision, and final approval.

## Competing interests

The authors declare no competing interests.

## Ethical approval

Approval was obtained from the ethics committee of the University of Aleppo NO 3/15 March 2022. The procedures used in this study adhere to the tenets of the Declaration of Helsinki. We confirm that all research was performed in accordance with relevant guidelines/regulations.

## Additional information

**Supplementary information** The online version contains supplementary material available at <https://doi.org/10.1057/s41599-023-01898-2>.

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