

Future of Gaza Health; Needs Assessment

A report commissioned by the
Gaza Health Rebuilding Initiative

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First Draft

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List of Abbreviations

Abbreviation	Definition
CDS	Central Drug Store
DCP	Disease Control Priorities
ICRC	International Committee of the Red Cross
ICU	Intensive Care Unit
IEHK	Interagency Emergency Health Kit
MoH	Ministry of Health
NCD	Non-Communicable Disease
NGO	Non-Governmental Organization
OECD	Organization for Economic Co-operation and Development
OOP	Out-of Pocket Payment
PIN	Population in Need
PMMS	Palestinian Military Medical Services
TESK	Trauma and Emergency Surgery Kit
UHC	Universal Health Coverage
UNICEF	United Nations International Children's Emergency Fund
UNFPA	United Nations Population Fund
UNRWA	United Nations Relief and Works Agency
USAID	United States Agency for International Development
WHO	World Health Organization

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The situation is getting more and more horrible by the day ... beyond belief, literally.... The health system is on its knees. Gaza cannot afford to lose any more health facilities, another single ambulance, any more hospitals ... or even a single hospital bed more”¹

- **Christian Lindmeier, World Health Organization spokesperson**

Executive Summary

This report outlines the findings and recommendations of the "Initiative to Rebuild Gaza's Health Sector," advocating for a collaborative, interfaith, and international approach to rejuvenate Gaza's health infrastructure. Presented at the First International Conference to Rebuild the Gaza Health Sector on 7 February 2024, in Amman, this report offers a neutral assessment of the necessary steps and resources for the effective restoration of Gaza's healthcare system.

The report is the result of extensive scientific research, theoretical models related to health system reconstruction and international benchmarks established by the World Health Organization (WHO), the SPHERE Project, the United Nations Relief and Works Agency (UNRWA), and contributions from over 40 global medical and aid professionals. It delineates an overview of the health system in Gaza prior to the conflict commencing on 7 October 2023, assesses the impact of the conflict on Gaza's overall health system and the immediate and long-term health of its inhabitants, and proposes a strategic roadmap for its reconstruction.

The proposed roadmap integrates the WHO's health system building blocks, concentrating on pivotal areas such as service delivery, human resources, medical supplies, and information systems. Despite acknowledgement of the significance of financial and governance aspects, they are not included in the initial phase due to the uncertainties caused by the ongoing conflict.

The report advocates a segmented reconstruction process, divided into four distinct phases:

In the first phase, the priority is to preserve the existing health system by maintaining service delivery, which includes over 90 essential health interventions. This can be achieved by leveraging alternative delivery models, such as mobile clinics and telemedicine.

The second phase initiates a recovery trajectory, scaling up services in immediate-impact areas, aligned with Gaza's health needs and capabilities. This includes critical appraisal and prioritization of infrastructure development.

The third phase entails the comprehensive rebuilding of the health system. This includes identifying needs based on societal health demands, system capabilities, and alignment with WHO standards. It also details the tangible requirements for reconstruction, defining milestones and necessitating an interdisciplinary approach that integrates other sectors in establishing the health system infrastructure, workforce, and information systems.

The final phase is the fortification for sustainability and it aims to transition the health system to local ownership for continued service delivery. This marks the shift from donor funding to local financial self-sustainability. Overall, there is a gradual evolution of data sophistication and a reduction in conflict intensity as the report progresses through each stage. It is important to note that the report acknowledges and respects the prevailing uncertainties regarding the demographic and geographic composition of Gaza.

To promote active engagement, the report proposes:

- 1** The creation of suitable taskforces to address Gaza's unique contextual challenges and conflict dynamics, focusing on damage assessment, health system planning, and resource mobilization;
- 2** The development of strategic alliances and advocacy initiatives to augment the scale and scope of the roadmap through sponsorship and strategic contributions, facilitating international support critical for a comprehensive and scientifically robust reconstruction of Gaza's health system; and
- 3** The organization of subsequent events that would transition towards a more operational focus, including fundraising and detailed planning for the rebuilding of Gaza's health system.

Background and Purpose of the Report

This report underlines the "Initiative to Rebuild Gaza's Health Sector," which advocates for a concerted effort, encompassing interfaith and international collaboration to revitalize the health system in Gaza. It endeavors to present a neutral, technical assessment of the requisite steps and resources to effectively restore Gaza's healthcare framework. In accordance with the WHO (2008) definition, this report considers all pivotal entities and establishments dedicated to fostering health, preventing, and treating diseases, along with community-based collaborators, such as health educators and community health workers.

The document outlines the inaugural phase of a tripartite strategy devised to ameliorate Gaza's health system. It is dedicated to assessing needs, succeeded by the strategic planning of the rebuilding effort, and culminating with the implementation of the reconstruction phase.

Phase 1: Identify and detail the healthcare needs of Gaza

Initial international conference **Rebuilding Gaza Health Sector** that will produce, publish and distribute the authoritative technical report **Future of Gaza Health; Needs Assessment**, detailing the needs and requirements to rebuild the healthcare educational and delivery systems in Gaza, Palestine.

- i. Conference date: February 7, 2024
- ii. Conference Location: Amman, Jordan

Phase 2: Source and fund the rebuild of the healthcare system

Second international conference that will pursue required funding to accomplish the recommendations produced in Phase 1 as shall be documented in the to-be published proceedings of the conference.

- i. Conference date: **TBD**
- ii. Conference Location: **TBD**

Phase 3: Rebuild the healthcare system

Engage the appropriate parties to rebuild, equip, furnish, supply and restart the disrupted facilities, in accordance with accepted international standards.

- i. Date & Duration: **TBD**

Disclaimer:

It is important to note that the information and data contained in this report is accurate at the time of writing, but subject to change post the 7 February conference, given the ongoing conflict situation. This report will be updated with new information and stakeholder inputs to reflect the evolving situation and adapt the recommendations accordingly.

Adherence to a principled approach is critical in the reconstruction of Gaza's health system, encompassing the following tenets:

- **Timeliness and Immediacy:** Seek a balance between the urgency to meet the immediate health needs of Gaza's society and the adequacy of resources.
- **Incremental and Realistic Approach:** Take into account healthcare essentials while progressively scaling the rebuilding efforts toward long-term sustainability.
- **Resource Optimization:** Utilize existing personnel, infrastructure, and expertise efficiently in the reconstruction process.
- **Comprehensive Care:** Develop a system that offers integrated services, addressing physical and mental health needs while acknowledging the social determinants of health.
- **Accessibility:** Ensure that the delivery models and structures are designed to meet the needs of both urban and rural communities.
- **Agility:** Adapt to shifts in the demographic and geographic landscape of the region.
- **Cultural Sensitivity:** Integrate local cultural values and beliefs into the healthcare framework.
- **Human resource protection and development:** Focus on continuous skill development and retention strategies to maintain a competent and skilled workforce.
- **Sustainability:** Aim to establish a self-sufficient health system driven by local stakeholders post-crisis.

This report is the result of a collaboration between more than 40 scholars and practitioners from different fields, including academia and medicine. They represent more than 30 entities spanning diverse geographies, including North America, Europe, the Middle East, and the Pacific. The document also assimilates technical counsel from more than 20 medical specializations, amalgamating an extensive spectrum of expert insights for an all-encompassing approach.

It predicates its analysis on a set of assumptions that warrant consideration:

- **Uncertainty of Conflict Status:** The unpredictable nature of the conflict (due to its active phase) poses challenges to the timeliness of reconstruction and adapting to the evolving health needs of Gaza's population.
- **Lack of Accurate Damage Assessment:** Without precise information on the extent of damage, planning for the reconstruction of healthcare infrastructure and effective resource allocation becomes problematic.
- **Obscured Health Needs Understanding:** The ongoing conflict complicates a clear comprehension of the current and future health needs of Gaza's population, including disease prevalence, mental health concerns, and other health-related consequences of the conflict.
- **Unclear Funding and Resource Availability:** Limited clarity on funding and resources restricts the scope and feasibility of planning and implementation.
- **Ambiguous Demographics:** Incomplete demographic data challenges the planning of health services tailored to the population's age, gender, population movements, and other critical factors.
- **Operational Challenges:** The conflict creates logistical and operational difficulties, such as access to certain areas, security risks for health workers, and disruptions in supply chains, potentially impeding the reconstruction process.
- **Dynamic Public Health Environment:** The volatile nature of public health in Gaza, characterized by the risk of infectious disease outbreaks, trauma cases, and psychological issues, adds complexity to the planning process.

Introduction

In the aftermath of 7 October, the reconstruction of Gaza has garnered attention from media outlets, academic circles, and international development agencies, highlighting the crucial need to rebuild the decimated environment. The reconstruction process, akin to any society emerging from destruction, begins with a focus on social services, such as education and healthcare, prompting debates about the future trajectory of Gazan society. According to the NBC News, "an estimated 80% of its population of 2.2 million has been displaced — the majority now confined to the south... toward the Rafah border with Egypt. Yet, a pressing question remains: **What will be the future of Gaza after this conflict concludes?**"²

The health system has been at the forefront of these discussions, as the immediate consequences of such devastation are evident. With 94 healthcare facilities damaged, at the time of writing, the system is under immense pressure and the repercussions of this are profound. The healthcare workforce has endured 612 fatalities and 778 injuries due to escalating violence, resulting in the loss of approximately 1,390 health personnel, precipitating a healthcare crisis of alarming proportions.

Moreover, a severe shortage of ambulances has worsened the already challenging situation, with merely six remaining to serve the entire civilian population, each responsible for approximately 350,000 individuals. The pressure on health facilities has escalated to critical levels, evidenced by a 351% increase in patient bed occupancy due to mass casualties and a 23-fold rise in communicable diseases, further impeding the provision of essential health services. Therefore, rebuilding a resilient healthcare system is essential for addressing the enduring effects on the health and well-being of the Gazan population.

Our report delves deeply into the development of a strategic plan for reconstructing Gaza's healthcare system. It raises critical questions about the most urgent health needs in Gaza, both immediate and long-term, and assesses the current state of healthcare facilities, medical equipment, supplies, and workforce. Additionally, it explores the potential funding sources for rebuilding and sustaining the health system and strategies for effective resource allocation and management. To provide a comprehensive analysis, the report raises the importance of considering the contextual needs, based on potential conflict scenarios across different time horizons.

Conflict is ongoing and poses uncertainties around the set up of Gaza, including current demographics, status of infrastructure, prevailing health conditions etc. Our report is, therefore, based on a practical approach to monitor progress, ensuring the maintenance of services while scaling towards the rebuilding stage. As such, we propose a reconstruction trajectory that includes four phases: First, preserving and protecting existing services; Second, initiating recovery operations; Third, rebuilding systemic capacities; And finally, fortifying sustainable and resilient health service delivery. We apply a transitional approach from immediate health system maintenance to a long-term re-development, as identified by Vergeer, Canavan, & Rothmann (2009)³. The proposed framework involves a thorough evaluation of restorative components, with the WHO health system building blocks being the ultimate dimensions of the health system rebuild journey, addressing essential components such as service delivery, workforce, information systems, and medical supplies. While financial and governance aspects are critical, we believe that they should be reserved for subsequent deliberation amidst ongoing conflict-related uncertainties and could be substituted by the humanitarian system and maybe the UN agencies.

This report is structured into three parts. It begins with an overview of Gaza's pre-conflict healthcare system, followed by the evaluation of the post-conflict impacts on healthcare needs and system-wide challenges, and finally outlines a reconstruction roadmap that advocates for maintenance and enhancement of services. It emphasizes the imperative of implementing these strategies, calling for the post- 7 February conference to foster a concerted, inclusive effort toward the healthcare system's restoration.

Part 1:

Overview of Healthcare System in Gaza: The situation before 7 October

The Gaza Strip is a narrow coastal land, approximately 41 kilometers (25 miles) long and 6 to 12 kilometers (4 to 7.5 miles) wide. This densely concentrated area has a population of 2,166,269 (1,097,553 males and 1,068,716 females) people⁴ with a density of almost 21,000 people per square mile.⁵ The age distribution reveals a relatively young population, with 40.7% of Palestinians living in Gaza being less than 15 years old.³

Table 1: Demography of Gaza 2022¹

Indicator	Gaza
Total population	2,166,269
Ratio of males to females	102.7 males per 100 females
Population natural growth rate	2.8%
Crude birth rate	26.5 births/1,000 population
Crude death rate	2.8 deaths/1,000 population
Total fertility rate	3.9
Life expectancy at birth (male)	72.8
Life expectancy at birth (female)	75.0

The examination of the health system in Gaza prior to 7 October 2023 has been the subject of thorough investigation through numerous academic research papers and studies conducted by international non-governmental organizations (NGOs) and other commentators. Prominent contributors to these scholarly works encompass publications such as the World Health Organization's Joint Health Sector Assessment Report of 2014⁶, the comprehensive report on the Gaza healthcare system by the Canadian Medical Association Journal in 2009⁷, and The Conversation's publication in 2023⁸, which highlight the broader health system challenges stemming from decades of underfunding and blockade-induced debilitation affecting Gaza's health infrastructure.

These studies' common perspective cover wider health system challenges sparked from situational blockade. That being said, systemic considerations conventionally outline severe financial underfunding, a persistent border blockade impeding the supply of essential medical resources and healthcare personnel into Gaza, and the impact on healthcare infrastructure arising from episodes of conflict. Our study explored the healthcare system of Gaza by leveraging the WHO's Health System Building Blocks as core focus domains, covering governance, financing, access to essential medicine, service delivery, health workforce, and health information.



**World Health
Organization**

Health System Building Blocks

Leadership/Governance

Effective oversight, regulation, and accountability of the health system. This includes strategic policy frameworks, effective governance, transparent, decision-making processes, and the engagement of stakeholders.

Service Delivery

Efficient and effective delivery of health services that meet the country's health needs and people-centered. This includes ensuring that services are high quality, safe, comprehensive, integrated, and accessible to everyone.

Health Financing

Adequate funding for health, and the efficient and equitable use of resources. This involves raising sufficient funds for health, reducing financial barriers to access, and ensuring people are protected from financial risks associated with paying for health services.

Health Workforce

Adequate, well-trained, and motivated health workers to meet the health needs of the population. This involves ensuring that there are enough healthcare providers who are properly trained, fairly distributed, and supported.

Access to Essential Medicines

Equitable access to essential and quality-assured medicines, vaccines, diagnostics, and other health technologies. This includes rational selection, affordable prices, sustainable financing, and efficient supply chain management.

Health Information Systems

Reliable, timely, and accurate health information to guide decision-making at all levels of the health system. This includes data collection, analysis, monitoring, and dissemination systems to inform policy and strategy.

In the wider spectrum, from a thematic standpoint, various studies demonstrate the overview of the health system from the angle of health challenges sparked by non-communicable diseases (NCDs). Factually, NCDs contribute to 40% of mortality in the region. Among the leading causes of morbidity and mortality are heart disease, cerebrovascular accidents, diabetes, and cancer.⁹ These conditions collectively account for a substantial portion of the health burden experienced by the population in Gaza.

Table 2: Burden of Cancer and Diabetes in Gaza, 2022¹⁰

Cause	Incidence rate per 100,000 population (2022)	Mortality rate per 100,000 population (2022)	Key Statistics
Cancer	94.5	42.2	<ul style="list-style-type: none"> - Cancer was the cause of 15.1% of all deaths in Gaza in 2022 - Breast cancer was the most common cancer with 394 new registered cases in 2022
Diabetes Mellitus	287.1	8.9	<ul style="list-style-type: none"> - Diabetes was the 10th highest cause of death in Gaza in 2022

Furthermore, the top 10 causes of death paint a grim picture of health struggles. Ischemic heart diseases and malignant neoplasms top the list, accounting for 17.8% and 15.1% of all deaths, respectively. Cerebrovascular diseases and COVID-19 follow closely behind, highlighting the burden of chronic and acute health conditions. However, it's the presence of unknown causes, respiratory illnesses, and congenital malformations that hint at deeper systemic issues. Despite efforts to address these health concerns, the data underscores the urgent need for comprehensive healthcare solutions to alleviate suffering and improve the well-being of Gaza's population.

Table 3: Top 10 causes of death in Gaza in 2022⁹

Rank	Top 10 causes of death in Gaza (2022)	%
1	Ischemic heart diseases	17.8
2	Malignant neoplasm	15.1
3	Cerebrovascular disease	11.6
4	COVID-19	6.8
5	Unknown causes	5.8
6	Disease of respiratory system	4.3
7	Congenital malformations	3.9
8	Hypertensive heart disease	3.8
9	Diseases in the perinatal period	3.3
10	Diabetes mellitus	3.2

From a systemic perspective, the accessibility of healthcare in Gaza presents significant challenges. The hospital bed-to-population ratio is approximately 2.5 times lower than the average ratio observed in Organisation for Economic Co-operation and Development (OECD) countries. Furthermore, the availability of essential medications is markedly impeded by the complexities arising from blockade measures. These issues are further exacerbated by constrained financial resources. For instance, the healthcare expenditure per capita in Gaza is a mere US\$389, which is almost 90% lower than the OECD average. Although various civil society initiatives and contributions from transnational organizations support the health system in Gaza, it continues to encounter numerous obstacles, particularly in the delivery of care.

WHO's Health system building blocks: Gaza healthcare system key finding prior to 7 october 2023

Leadership/ Governance	<ul style="list-style-type: none"> • Key contributors to delivering healthcare services in Gaza: Ministry of Health (also from a regulatory standpoint), UNRWA, International NGOs, Palestinian Military Medical Services (PMMS) and the private sector
Service Delivery	<ul style="list-style-type: none"> • Access to healthcare is a challenge: Gaza's number of hospital beds per 1,000 population is over 2.5x below the OECD average, in addition to thousands of referrals being issued for treatment outside of Gaza • Primary healthcare is overseen by MoH and WHO: with a number of facilities from various providers offering services from basic to comprehensive, including emergency and reproductive care by NGOs
Health Workforce	<ul style="list-style-type: none"> • Training provision and licensing for healthcare workforce: substandard mechanisms for regulation and accreditation of healthcare workforce • Healthcare professional to population ratios: partly due to an exodus of healthcare staff due to security risks and deterioration of the healthcare system and the cost of medical school compared to average salary in Gaza
Health Information system	<ul style="list-style-type: none"> • Factors contributing to hindering the quality of health data: electricity shortages, infrastructure damage, destruction of patient records, and a shortage of administrative staff
Access to essential medicines	<ul style="list-style-type: none"> • Suboptimal access to essential medicines: WHO has reported a rise in the amount of Zero Stock Drugs (critical supplies that will be depleted in less than one month), peaking at 58% in 2012, impacting Gaza's health supply
Health Financing	<ul style="list-style-type: none"> • Underfunding of healthcare services: with total healthcare spending per capita in 2019 standing at 383.9 USD in 2019, compared with the average spending figure across OECD countries deemed to be greater than 4,000 USD

Governance

The governance and leadership of Gaza's health system demonstrate critical components covering the oversight of policy development, regulatory measures, system design and accountability mechanisms. The Ministry of Health (MoH) assumes the pivotal role of supervising and administering healthcare services from a regulatory standpoint. It sets policies, regulates health facilities, and coordinates public health initiatives. A significant aspect of healthcare delivery has involved the Ministry's collaboration with the United Nations agencies including UNRWA to provide healthcare services to most Palestinian refugees in the region. International non-governmental organizations (NGOs), such as Doctors Without Borders and the International Committee of the Red Cross (ICRC), also contribute significantly to healthcare delivery by bridging critical gaps in healthcare, offering emergency medical aid, rehabilitation services, and other essential health services.



This multifaceted model, however, introduces complexities in the establishment of an integrated care delivery system and presents substantial challenges in maintaining consistency and national dependence from international aid in the care model.

Service Delivery

As of 2022, the number of hospital facilities in Gaza stood at 35*, which translates to 2,614 beds at a rate of 1.21 hospital beds per 1,000 population in Gaza¹¹. When compared to the average rate of 4.4 hospital beds per 1,000 population across OECD countries in 2019¹². This reveals a significant challenge in delivering basic healthcare services to the population. Additionally, the health sector grapples with recurrent power cuts and fuel shortages, leading to closures of operating theaters, emergency departments and wards¹³.

**Figure is as per the Palestine Ministry of Health - Health Annual Report 2022. Please note the WHO quote the number of hospitals in Gaza as 36 in 2024 Emergency Situation Update reports and as such this figure is referenced later on in this report*



Patient Awareness and Treatment of Cancer in Gaza

Many people in Gaza do not seek treatment for cancer due to lack of awareness about the disease...and [patients] also suffer from a shortage of diagnostic tools such as PET, MRI and CT scanners

Dr. Salim Hamza Saqr, Head of the Surgery Department, Nasser Medical Complex, Khan Yunis

Primary healthcare services in Gaza are delivered by a multitude of different organizations. As of 2022, there were 159 primary health care facilities in Gaza - managed by a combination of the Ministry of Health, UNRWA, NGOs and the Palestinian Military Medical Services (PMMS) - catering to the primary health care needs of the population of Gaza.⁸

Table 4: Primary Healthcare Center Providers in Gaza in 2022¹⁰

MoH	UNRWA	NGOs	PMMS	Total
52	22	80	5	159

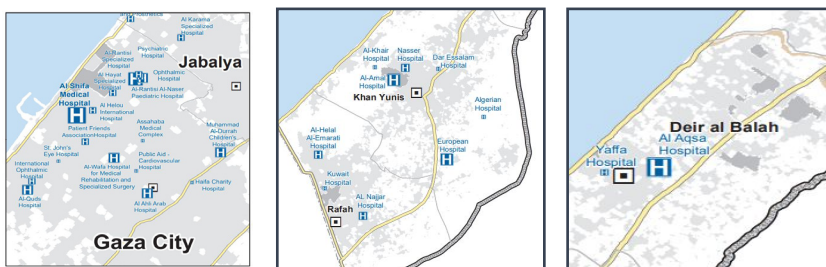
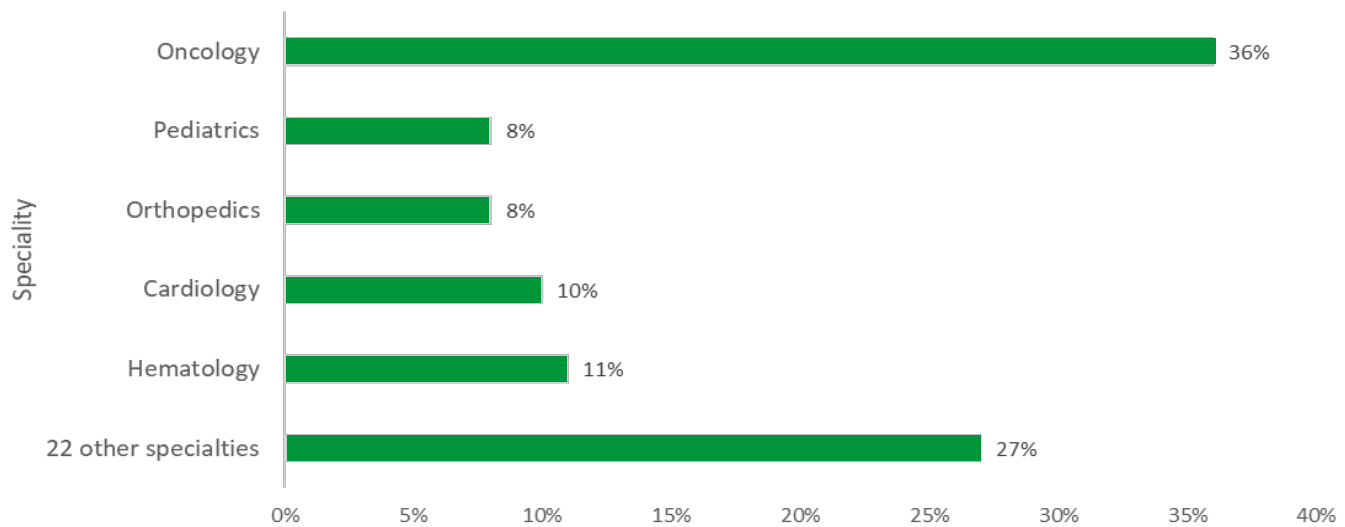
These facilities offer a range of services and are classified into four levels by the Ministry of Health.

Table 5: Primary Healthcare Center Classifications in Gaza in 2022¹⁰

Level	Preventive services	Curative services
1	- Mother and child healthcare	- First aid
2	- Immunization - Health education	- General practice medical care - Laboratory services (in some clinics)
3		- General practice medical care - Dental healthcare - Medical specialist laboratory services - Specialized clinic services (in some clinics)
4	- Mother and child healthcare - Immunization - Health education - Family planning	- General practice medical care - Dental healthcare - Medical specialist care - Gynaecology and obstetrics - Laboratory services - Radiology services - Emergency medical services (EMS) - Other specialized clinic services

Additionally, access to healthcare is a challenge in Gaza, with the Ministry of Health issuing thousands of patient referrals for treatment outside of Gaza (i.e., in East Jerusalem hospitals, West Bank outside East Jerusalem and Israeli hospitals). The top five specialties accounted for 73% of referral permit applications in July 2023¹⁴, summarized in the below figure.

Percentage (%) of total referral permit applications for treatment outside of Gaza in July 2023



Figures 2,3,4: Hospital distributions across Gaza strip (size of the letter H corresponds to the number of beds) Retrieved from OCHA.

During conflicts, the targeting of health infrastructure in Gaza has become a frequent occurrence. This has severely reduced the capacity of the health system in Gaza to meet the needs of the population. For instance, 147 hospitals and primary health clinics and 80 ambulances were damaged or destroyed¹⁵ between 2008 and 2014.

Health Workforce

The Health Workforce situation in Gaza is facing challenges from both capability and capacity aspects. According to a study conducted by the Institute for Health Metrics and Evaluation at the University of Washington, in order to reach 80 out of 100 on the Universal Health Coverage (UHC) index¹⁶, 20.7 physicians, 70.6 nurses and midwifery personnel, 8.2 dentists and 9.4 pharmacists per 10,000 population would be required¹⁷. When comparing these target figures to that of the healthcare workforce composition in Gaza as of 2021¹⁸, a significant gap is revealed across all professions, with the exception of pharmacists. These capacity issues are further compounded by a notable exodus of medical professionals from Gaza, driven by security risks and the deterioration of the health system. In the year 2018 alone, a total of 84 doctors departed from Gaza.¹⁹

Table 6: Health Workforce Numbers in Gaza:	Gaza (2021)	Estimated figure to achieve 80/100 on the UHC Effective Coverage Index (2019)
Physicians	15.2	20.7
Nurses and midwives	22	70.6
Dentists	1.1	8.2
Pharmacists	16.5	9.4

In terms of capability, the accreditation and regulation of the healthcare workforce in Gaza requires improvement in particular areas, according to Stakeholders' Perception of the Palestinian Health Workforce Accreditation and Regulation System, which included a number of participants from Gaza. The publication outlines that the governing system for accreditation and regulation of healthcare workforce has 'no specific body and no clear mechanisms of operation'. This lack of clear regulations presents the risk of inadequately trained healthcare workers with no clear competence standards, compromising quality of patient care in Gaza²⁰. While there is little evidence of a systematic, top-down approach to delivering training courses to healthcare staff in Gaza, several NGOs have been active in providing a range of training courses.

Table 7: NGO Training Courses Delivered to Healthcare Staff in Gaza

Organization	Training course delivered (sample)
Doctors Without Borders	Intensive Care ²¹
World Health Organisation	Intensive Care ²² ; Mass Casualty Management ²³
Medical Aid for Palestinians	Colorectal Surgery ²⁴
Norwegian Aid Committee	Mental Health ²⁵
Ideals	Trauma Care ²⁶

In a recent report by Fajr Scientific, it was highlighted that Gaza is facing a shortage of specialized medical practitioners, particularly in surgery, which impedes prompt diagnosis, treatment, and recovery for musculoskeletal issues. Establishing training programs through financial allocation can bolster the proficiency of local healthcare workers and attract global specialists to provide specialized care.²⁷

There are two medical schools in Gaza: the Islamic University of Gaza and Al-Azhar University.²⁸ In 2021, a class of 123 students from the Islamic University of Gaza had studied for six years to become physicians; however, 73 of them were unable to graduate due to their unpaid tuition fees. This factor partly contributes to the lack of resources among Gaza's medical students, with the UN reporting that the average salary in Gaza is \$2,000 annually, which translates to half of the annual fee for medical school.²⁹

Health Information Systems

At a fundamental level, an effective health information system is crucial for generating, analyzing, distributing, and strategically applying health-related data. However, in the health sector, a qualitative approach is often necessary for information system analysis. Unfortunately, the prior conflicts in Gaza have created many challenges, including electricity shortages, infrastructural damages, loss of patient records, and a deficit in administrative personnel.³⁰ These impediments substantially obstruct the collection and utilization of health data, thereby adversely affecting health policy formulation. The pre-existing vulnerabilities identified within the healthcare system have rendered it inadequately prepared for informed planning and accurate health information dissemination.

Access to Essential Medicines

The supply chain for medical equipment and medicines in Gaza has been inadequate even prior to 7 October 2023, with multiple instances of unavailability of drugs and medical equipment. In January 2008, the WHO reported that the country lacked 19% of necessary medicines and 31% of vital medical equipment.³¹ The situation worsened since then and in 2014, the WHO Joint Health Cluster reported that the percentage of Zero Stock Drugs had increased over the past seven years, reaching a height of 58% in 2012. Zero Stock Drugs are critical supplies that would be depleted in less than a month at the Central Drug Store (CDS) which supplies all MoH hospitals and PHCs in Gaza. Therefore, this shortage has undoubtedly contributed to negative health outcomes for the population of Gaza even before 7 October.

Health Financing

Health system financing refers to resources used for healthcare spending and ensuring that individuals have access to medical services without facing severe financial hardships. It also aims to remove barriers for disadvantaged populations and prevent medical costs from inducing poverty for patients and families. In our context, secondary data on healthcare expenditure is generally consolidated together with the West Bank and no specific data for Gaza is available.

Research into healthcare spending per capita reveals an almost tenfold difference between Palestine healthcare spending and the average healthcare spending figure per capita across OECD countries. In 2021, the total healthcare spending per person in Palestine was only US\$383.9, significantly lower than the average spending figure across OECD countries, which was greater than US\$4,000 in 2019. This outlines a drastic deficiency in available resources to be invested in healthcare per each individual in Palestine.^{32,33}

Regarding the recent share in total health expenditure for Palestine in 2017, the public sector, represented by the Ministry of Health, contributed approximately 42.4% of the total health expenditure. Direct out-of-pocket (OOP) payments accounted for 41.8%, private institutions (both for-profit and not-for-profit) contributed 12.4%, and international donors contributed 3.5%. The absence of a national health insurance system compels numerous individuals to make direct out-of-pocket payments for their healthcare needs. These OOP payments encompass various expenses such as co-payments for treatments, expenditures on medications and diagnostics, direct purchases of medicines from private pharmacies, and visits to private physicians and health centers.³⁴

Part 2:

Impact on the Health System: The situation post 7 October to date

Since the escalation of conflict in Gaza on 7 October, the health system in the region has been facing severe consequences. Severe damage has destroyed its healthcare infrastructure. The remaining medical teams grapple with limited access to crucial supplies, while civilians face acute shortages of necessities such as food, water, and electricity.³⁵ Hospitals, already strained, confront overwhelming casualties, pushing bed capacity to an alarming 351% and compromising essential health services.³⁶ Together, these issues combine to form a perilous situation for Gaza's health system, which is now overburdened and overwhelmed by the large numbers of deaths and injuries, rapid spread of disease, and widespread hunger. Undeterred by dangers, humanitarian agencies persevere in delivering aid, reaching over 600,000 people. WHO has secured approximately US\$52m from partners like UNICEF and the Red Cross, contributing to medicine, vaccines, and first aid donations. However, aid delivery faces constraints due to security challenges, limited access, transport issues, and deconfliction challenges.

International Medical Corps Deploys Field Hospital To Provide Life-saving Medical Care in Gaza



A 60-70 bed field hospital in southern Gaza has been established by the humanitarian aid organization International Medical Corps, in an attempt to enhance the region's critical health service. Voluntary field hospital staff provide inpatient and emergency-care services 24 hours per day, 7 days a week, offering surgical care, physical rehabilitation, emergency obstetric and newborn care, advanced mental health services, and more.

International Medical Corps, January 6, 2024

Given the critical nature of the situation, where Gaza is in desperate need of healthcare assistance, alternative efforts to deliver medical assistance have been deployed. These measures include the provision of medical expertise through telehealth and virtual consultations, setting up field hospitals and mobile clinics within and around Gaza, and providing medical care to those in need in overseas facilities. Noteworthy cross-border initiatives include the UAE's commitment to treating 1,000 Palestinian cancer patients; and the deployment of a French field hospital on a ship off the coast of Egypt, dedicated to providing medical care to injured civilians from Gaza.

While these endeavors are reactive in nature – responding to emergency cases as they arise – they are unable to address the overarching issue of a collapsed health system. Recognizing this, there is a call for a comprehensive study that takes a holistic approach to tackle the wider issue, rebuilding Gaza's healthcare system post- 7 October. To aid on this journey, our report analyzes the impact of conflict on the health system through two lenses: the health of the population and the healthcare system.³⁷

1 Health of the Population

Concerning the population's health, the immediate effects in Gaza are starkly clear. Morbidity and mortality has dramatically increased, with over 31,497 deaths and 61,079 injuries as of January 18.³⁸ The predominant injuries observed include fractures, peripheral nerve injuries, amputations, spinal cord injuries, burns and more. Since 7 October alone, more than 1,000 children have had one or both legs amputated, according to UNICEF.³⁹

Beyond the immediate suffering, individuals are faced with the prospect of long-term complications such as physical disabilities, chronic pain and joint stiffness, all exacerbated by the absence of prompt and specialized medical intervention. OCHA has estimated that 1,500 people have now suffered permanent disabilities, including 600 children.⁴⁰

Gaza strip since October, 7

31,497
Fatalities

61,154
Injuries

1.955 million
Displaced People

Emergency Bulletin, The Health Status in Gaza, EMPHNET, January, 18, 2024

The health repercussions stemming from the ongoing crisis are also expected to give rise to long-term diseases. Since 2022, Gaza has experienced a significant 23-fold surge in communicable diseases, linked to the displacement of more than 90% of its population.¹⁶ This displacement has heightened the challenges of poor health conditions and malnutrition, leading to a notable increase in the prevalence of diseases such as diarrhea, scabies, and chickenpox.⁴¹ The United Nations warns that after exhausting its supply of children's vaccines and other medical supplies, the incidence of a further 14 diseases with "epidemic potential" could occur in the region, including meningitis and acute viral hepatitis.^{42,43} In addition, research indicates that populations in conflict zones are more likely to experience an increased risk of non-communicable disease including heart disease, stroke, diabetes and increased blood pressure.⁴⁴ This is particularly significant in Gaza, where there is already a substantial burden of 350,000 cases of non-communicable diseases, adding to the complex health challenges faced by the population.



WHO Director General speaks on Gaza Health System



"Gaza's health system is on its knees and collapsing...."

"...Two major hospitals in southern Gaza are operating at three times their bed capacity, running out of supplies and sheltering thousands of displaced people."

Tedros A. Ghebreyesus, Director General of the World Health Organization, December 10, 2023

Communicable Diseases in Gaza; cases recorded since mid-October



213,083
Cases of acute respiratory infections



152,734
Cases of diarrhea



68,486
Cases of scabies and lice



44,437
Cases of skin rashes



6,609
Cases of chickenpox

between war injuries and the emergence of NCDs, emphasizing the interconnectedness of health issues arising from conflict.⁴⁵ War injuries not only strain healthcare resources but can also exacerbate the already diminished capacity of a healthcare system during ongoing conflict. This implies that war injury care can help alleviate the healthcare burden amidst the destruction of Gaza's healthcare system. Other devastating long-term health implications stem from an increase in psychological distress, as trauma associated with conflict is intricately connected to various mental health disorders, such as post-traumatic stress, depression, and anxiety.

2 Health System

Amid the ongoing conflict, Gaza's healthcare system is on the edge of collapse, hindered by an inability to rebuild infrastructure. It has been stretched to the point where it can no longer provide essential care to the injured, the sick, and everyday patients. Medics and patients flee Gaza's remaining hospitals, putting extra pressure on over-burdened hospitals that remain open. In the sections below, we look at the impact of the conflict on service delivery, the health workforce, health information systems and access to essential medicines.

Building Block	Focus Area
Service Delivery	The ongoing conflict in Gaza has led to attacks on 94 health facilities, overwhelming the remaining institutions, pushing ICU bed occupancy to 242%, and leaving only six ambulances, significantly jeopardizing essential healthcare services.
Health Workforce	Over 612 fatalities and 776 injuries of health professionals have occurred since October 7, whilst over 70% of healthcare workers have left major hospitals and care facilities. Remaining doctors face immense psychological trauma and physical exhaustion, necessitating the recruitment of international health professionals to alleviate the strain.
Health Information Systems	Gaza's health information systems have been disrupted by nine prolonged blackouts since October, impeding telecommunication and infection reporting, complicating timely responses and aid efforts.
Access to Essential Medicines	Depletions in essential medical supplies in Gaza, due to direct damage, fuel shortages, and electricity disruptions, creating a severe stock-out of vaccinations and leaving the 100% of northern Gaza hospitals depleted of life-saving medical supplies.

Service Delivery

The ongoing conflict in Gaza has resulted in severe health repercussions, with more than 94 health facilities coming under attack. As a consequence, 15 out of 36 hospitals (42%) are partially functioning, while only 13 out of 72 primary healthcare facilities (18%) are operational. The remaining health facilities are also grappling with capacity challenges, illustrated by a staggering 65% reduction in hospital bed capacity since 7 October that has pushed bed occupancy levels to 351%. Intensive care units (ICUs) are particularly strained, with an average bed occupancy of 242% and extreme shortages in medical supplies.⁴⁶



The Palestine Red Crescent Society leave Gaza for two months due to attacks on its EMS centers and ambulances

Due to their dependence on essential medical infrastructure, humanitarian aid organizations, including the Palestine Red Crescent Society, have been compelled to temporarily suspend their medical service stations in Gaza for several weeks due to attacks on their medical facilities and ambulances.

Relief Web, OCHA, December 2023

9 partially functioning hospitals in south are operating at **3 times bed capacity**

January, 23, 2024 (Relief Web, OCHA)

To exacerbate the situation, only six ambulances now remain to serve the civilians in Gaza, equating to an average of 362,000* individuals per ambulance.⁴⁷ A considerable number of severely injured individuals are therefore unable to access any form of urgent medical care, due to the scarcity of ambulances, blocked roads and fallen debris. Additionally, healthcare facilities face significant challenges in addressing complex conflict-related injuries, such as burns and traumatic brain injuries, due to shortages in resources and expertise. Concurrently, the prioritization of emergency cases has led to an inability to carry out routine health interventions, such as treatments of chronic disease, further overwhelming the healthcare system and causing a backlog for those in need of essential medical attention.

Table 8: Bed Occupancy and Active Workforce in 3 of Gaza's Major Health Facilities

Hospital	Bed Occupancy	Active Workforce	Date of Report
Nasser Medical Complex	200%	30%	18 January 2024
Al-Aqsa Hospital	N/A	10%	23 January 2024
Al-Shifa Hospital	150%	N/A	24 October 2023

Health Workforce

Since 7 October, health professionals in Gaza, including doctors, nurses and pharmacies, have been subjected to a growing number of attacks, resulting in 612 fatalities and 776 injuries.⁵¹ As a result, at least 1,388 healthcare personnel are now unable to serve the population's critical healthcare needs. Meanwhile, many health workers are leaving Gaza in refuge, further depleting the region's active health workforce. According to WHO, over 70% of healthcare workers in Gaza have left major hospitals and care facilities, exacerbating the shortage of specialized critical care and emergency surgeons. This scarcity is putting a strain on the ability to provide comprehensive healthcare.

At the Al-Aqsa Hospital, which is one of the few operational healthcare facilities in Gaza, only 12 doctors remain on duty. This is about 10% of the staff that was present before the start of the conflict. Similarly, the Nasser Hospital has also experienced a significant drop in the number of staff and patients. Over 50% of the staff have left, resulting in only 400 out of 750 patients still remaining.⁵²

The doctors who remain face immense psychological trauma and are perpetually concerned for their safety and that of their families. Many are experiencing severe physical exhaustion as they are forced to take on additional burdens and work long hours to provide essential care. The diminishing workforce, exacerbated by burnout, necessitates the recruitment of international staff to alleviate the strain on remaining healthcare providers.



612
Health Personnel
Fatalities

Since October, 7, 2023



776
Attacks on the
Health Sector

Occupied Palestinian Territory Emergency Situation Update:
Gaza, WHO, January 11, 2024



45
Ambulances
Damaged

Health Information Systems



Healthcare Desperation in Gaza: Thousands Left Vulnerable as Chronic Illnesses Go Untreated

Tens of thousands in Gaza with chronic life-threatening illnesses have gone without treatment for months, and are now “without defenses”, their bodies’ weakened by malnutrition, cold and fatigue.

Indirect casualties in Gaza, The Guardian, January, 19, 2024

As a result of the ongoing conflict that has destroyed vital infrastructure, Gaza faces a major challenge with its health information systems. Since 7 October, Gaza has experienced nine widespread blackouts lasting more than 24 hours, rendering communication devices, such as mobile phones, computers, and radios, inoperable. As a result, this has hindered the ability to report critical information on infections and communication in and around the conflict zone.⁵³

The lack of communication channels between health facilities has also resulted in difficulties in reporting important health information, such as bed occupancy, medical stock, and essential needs. Moreover, the destruction has caused the loss of patient records, making it challenging to collect vital health data and leaving no trace of integrated digital health systems that were once operational. This has led to isolated reporting, creating a fragmented perspective on the needs of Gaza's healthcare system. The absence of comprehensive disease surveillance and early warning and alert response systems have further compounded these challenges, making it difficult for humanitarian aid organizations to provide timely medical interventions effectively.

Access to Essential Medicines

Throughout the conflict, Gaza has confronted depletions in essential medical supplies and equipment due to direct damage, shortages in fuel, electricity, and the lack of safe or accessible routes for aid delivery. Although it is currently not possible to compile exact figures, the fact remains that an acute shortage of anesthetics, antibiotics, pain medications, insulin and blood prevents the provision of lifesaving care to thousands in need. According to the Palestinian Ministry of Health, Gaza is confronting a severe stock-out of vaccinations, contributing to a reported 360,000 cases of infectious diseases in UNRWA shelters.⁵⁴ In the northern Gaza region, 100% of hospitals are now deprived of life-saving medical supplies, leaving the area without a functional hospital, as health complications continue to escalate.

The absence of access to essential medicines places medical staff in a dire situation, where they are not only unable to address critical emergency cases but also struggle with fulfilling core healthcare needs, such as managing heart disease and cancer. Health workers are forced to extract shrapnel and conduct amputations without adequate anesthesia, and must witness children succumb to cancers due to a lack of medicine.

In northern Gaza, **100% of hospitals** are now **deprived of life-saving medical supplies** due to the ongoing conflict

The current situation prompts three pivotal questions that demand focused attention in approaching future health requirements in Gaza:

- How and when will the ongoing emergency response evolve into a comprehensive approach focused on rebuilding the health system and infrastructure?
- What strategies are required for the systematic reconstruction of Gaza's health system, emphasizing a shift from reactive measures to proactive, sustained rebuilding efforts?
- In prioritizing the rebuilding process, what are the key public health concerns that demand urgent attention?

Part 3:

Future of Health Requirements

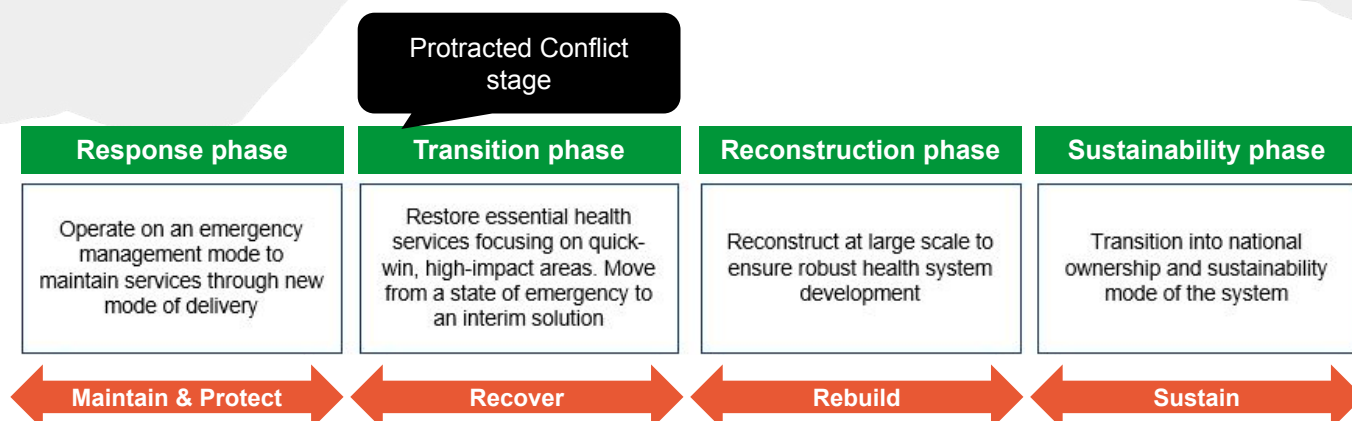
Despite the political uncertainty that follows a war, health system rebuilds have been an important topic of discussion in academic circles, in particular the question of how and when to transition most effectively from relief to development programming (Vergeer, Canavan, & Rothmann, 2009).⁵⁵ Our reconstruction framework involves evaluating the different elements that need to be restored (“why”) and developing a process to smoothly transition from preserving current services to the rebuilding phase (“how”). This methodology is informed by an acute awareness of the predominant challenges, including displacement, trauma, and vulnerability, as recommended by Waters et al. (2007).⁵⁶

What needs to be rebuilt: The rebuilding agenda adopts the conceptual framework of the World Health Organization's health system building blocks, which encompass service delivery, the health workforce, health information systems, and the provision of medical products and vaccines. It is important to note that the facets of financing and governance, though integral, will be delineated at a subsequent stage due to the current uncertainties surrounding the conflict. The overarching funding assumption is that the rebuild of the Gaza healthcare system will be financed by international donor organizations and aid contributions from international government agencies.

Area	Coverage	Benefits
Service Delivery	<ul style="list-style-type: none"> • Demand and supply side barriers to care • Inclusive, accountable processes for determining the list of essential services • Public health focus on social determinants 	<ul style="list-style-type: none"> • Service Inclusivity • Advanced patient outcomes
Health Information Systems	<ul style="list-style-type: none"> • Information systems incl. data generation, (ii) compilation, (iii) analysis and synthesis, and (iv) communication and use) • Civil society organizations and health cluster inputs to expand data inputs 	<ul style="list-style-type: none"> • Accurate information for informed decision making • Progress monitoring and needs identification
Health Workforce	<ul style="list-style-type: none"> • Workforce capacity including clinical staff, management, and support staff • Workforce capability to ensure effective care delivery (trained health personnel in sufficient numbers to deliver care to the population) 	<ul style="list-style-type: none"> • Rapid resumption and scale up of services
Access to Essential Medicines	<ul style="list-style-type: none"> • Supply chain for essential medicines and vaccines • Quality assurance, and efficient procurement and distribution systems. 	<ul style="list-style-type: none"> • To address key contributors to functioning of facilities • Rapid resumption and scale up of services
Health Financing	<ul style="list-style-type: none"> • Funding allocation formulas to support the need across the health system 	<ul style="list-style-type: none"> • Ensures resource allocation to sustain services

How is the rebuild process shaped?

The reconstruction process is envisaged to unfold in four distinct phases; responding swiftly to ensure the continuity of service and care delivery to the greatest extent possible; initiating recovery processes and interim solutions; advancing to rebuild the system to its full capacity; and ultimately achieving a sustained and resilient health service.



Phase 1: Response

During the Response phase of the Gaza health system reconstruction, the main priority is to ensure the delivery of essential healthcare services in emergency situations.⁵⁷ This phase involves interventions such as prioritizing treatment for those in acute need, implementing alternative service delivery models, including mobile clinics, maximizing the acquisition of foreign aid, ensuring the availability of essential medications to maintain the emergency response, and harnessing the expertise of external clinical professionals via telehealth to enhance service capabilities. Additionally, to streamline the rebuilding process, it is essential to establish a robust data collection infrastructure that can inform external stakeholders of Gaza's healthcare requirements and enable proactive intervention strategies.

Building Block	Focus Area
Service Delivery	<ul style="list-style-type: none"> Focus on prioritization of 92 healthcare interventions during immediate crisis covering areas such as (but not limited to) surgery, emergency care, maternal health Considerations made to alternative delivery models (e.g. mobile clinics - geographically dispersed in a way that protects their safety and security) to foster a dynamic and adaptable approach
Health Workforce	<ul style="list-style-type: none"> Mental health and psychosocial support to existing workforce whilst capacity supplemented by telehealth delivery model
Health Information Systems	<ul style="list-style-type: none"> Applicability of telehealth solutions to enable willing physicians and other health professionals to support delivery of healthcare from remote locations
Access to Essential Medicines	<ul style="list-style-type: none"> Deployment of WHO emergency medical kits
Health Financing	<ul style="list-style-type: none"> Mobilization International donors and foreign governments to provide fiscal support

Service Delivery

During severe disruption to healthcare services (i.e., sustained armed conflict), the Gaza healthcare system should strategically prioritize the delivery of specific clinical specialties and services to address the healthcare challenges. The primary objective at this time is to efficiently allocate resources and expertise to save lives, mitigate the impact of injuries and to maintain fundamental core healthcare services (e.g., maternal and newborn health). As such, 92 healthcare interventions have been identified as being crucial to be included in the Response phase, based on the highest priority package (HPP) for universal health coverage (UHC) developed by the Disease Control Priorities (DCP) project.*



It is essential to consider alternative delivery models to maximize access to critical services in Gaza, while it still navigates the conflict situation. This will ensure adaptability and a dynamic approach that lessens the impact on patients of damaged healthcare facilities. For example, mobile clinics should be geographically dispersed to reach and treat vulnerable individuals who struggle with access to essential services during humanitarian crises. Additionally, rapidly deployable field hospitals can be set up to expand the capacity of the existing health system temporarily, while medical repatriations have also emerged as a prominent aspect, with various governments ready to facilitate the transfer and treatment of critically ill patients in their countries of origin. Such collaborative efforts and alliances can be extensively expanded to enhance service delivery capacity on a larger scale.

SNAPSHOT Mobile Clinic Model

The FAJR Healthcare Bridge: Transitioning from a Mobile Hospital to an Academic Multispecialty Surgical Centre of Excellence



The FAJR Healthcare Bridge initiative is designed to address the unique healthcare needs of the Gaza region by providing comprehensive support in the form of an intensive care unit, surgical facilities, operating room ancillaries, power generation, and air purification systems. This model facilitates a robust healthcare delivery framework during both immediate response and subsequent transitional phases (see below). Key features of this initiative include:

- A minimum capacity of 120 beds
- Eight fully equipped operating theaters
- Eight Intensive Care Units (ICUs) designed to meet the surgical and critical care requisites of patients
- A dedicated sterilization zone adjacent to each operating theater
- Strategic location in Northern Gaza to maximize accessibility

The principal aim of this initiative is to facilitate the transformation of the existing mobile hospital infrastructure into a permanent, academically affiliated Multispecialty Surgical Centre of Excellence (CoE). Critical prerequisites at this juncture encompass the establishment of:

- Collaborative partnerships with regional healthcare entities, governmental bodies, and non-governmental organizations (NGOs)
- Continuous professional development programs for medical and ancillary staff to advance competencies in mobile healthcare service provision
- Effective communication and coordination mechanisms among all stakeholders
- A robust technological infrastructure to support healthcare operations

Revitalizing Palestine: A \$200 Million 5-Year Recovery Plan to Tackle the Surgical Crisis in Palestine, January, 18, 2023

Health Workforce

Healthcare staff are facing many challenges in addition to physical exhaustion, including the emotional toll of losing family members, damage to their homes, and displacement of their families which are impacting their ability to care and services to the wounded.⁵⁸ In the immediate-term, focus should be on ensuring the existing healthcare workforce in Gaza is provided with safety, including adequate mental health and psychosocial support to enable them to provide the best possible care to patients. This support can be provided on a remote basis through telehealth platforms (tele-mental health), which has already been explored for displaced Syrians in Lebanon, Jordan and Tunisia and includes, for example, guiding patients through therapy virtually using structured writing assignments.⁵⁹ While the deployment of international emergency medical response teams would be the best approach to supplement the healthcare workforce capacity on the ground, the blockade currently prevents this option. Therefore more actionable strategies will need to be considered and implemented, such as telehealth solutions.

Health Information Systems

It is important to consider how Gaza can leverage external providers willing to provide remote clinical support in the form of alternative health delivery models to contribute to a dynamic and adaptable immediate response to the crisis. The telehealth approach, for example, is scalable, presenting opportunities for willing physicians to support the response who otherwise could not do so on an actual emergency deployment to Gaza (the average emergency deployment lasts 122 days, according to UNICEF).⁶⁰ Telehealth facilitates the opportunity for real-time, peer-to-peer consultation and supports decision-making on complex cases⁶¹ and the interventions required.

Access to Essential Medicines

To alleviate suffering and provide immediate assistance to vulnerable individuals, WHO standard emergency health kits⁶² (in addition to UNFPA emergency reproductive health kits) should be deployed to the population of Gaza in need of emergency care. A variety of these kits are available and should be prioritized based on the context of the emergency in Gaza and to support delivery of the pre-identified crucial healthcare interventions. Given this criteria, WHO standard emergency health kits should be made readily available to support emergency care.

Table 9: SAMPLE WHO Standard Emergency Health Kits

Emergency Health Kit	Description	Each kit serves
Interagency Emergency Health Kit 2017	The IEHK 2017 is designed principally to meet the priority health needs of a population affected by emergencies, who have limited access to routine health care services.	10,000 people for 3 months
Trauma and Emergency Surgery Kit 2019	WHO trauma and emergency surgery kit (TESK) aims to provide materials and drugs to meet the needs of 50 patients requiring surgical care in emergency situations, assuming an average of two operations per patient.	50 hospitalized trauma patients
PED/SAM 2020	The PED/SAM kit is especially designed to provide medicines, renewables and equipment suitable for children and to treat the common childhood illness including severe acute malnutrition with medical complications.	Sick Children (including SAM)
Sample Collection Kit 2022	This kit contains the necessary supply for the collection and transport of biomedical samples (Blood, CSF, stool, urine, skin and respiratory samples).	-
Non Communicable Diseases Kit 2022	Provides essential medicines and medical devices for the management of hypertension and cardiac conditions, diabetes & endocrine conditions and chronic respiratory diseases.	10,000 people for 3 months
UNFPA Emergency Reproductive Health Kits	UNFPA maintains a stock of 18 different essential reproductive health kits (RH Kits), ready to ship for urgent and emergency requests. The kits are divided into three blocks, and are designed to respond to three month's need for various population sizes.	Block 1: 10,000 people for 3 months Block 2: 30,000 people for 3 months Block 3: 150,000 people for 3 months

To provide some level of quantification of the amount of health kits that are required to support immediate response, the Population in Need (PIN) approach can be applied to calculate estimates for the size of the population in need. For example, assuming the entire population of Gaza (c. 2,000,000 people) is in need of the Interagency Emergency Health Kit 2017, and that the kit supplies 10,000 people over the course of 3 months, then 200 of this specific kit is essential.

Phase 2: Transition

The Transition phase assumes a protracted stage of the conflict and is characterized by a dual focus on the maintenance and enhancement of healthcare services. This phase entails a comprehensive approach that includes the refurbishment and upgrading of medical facilities, addressing minor adjustments such as bed and ICU enhancements, as well as infrastructure improvements like electricity supply. Prioritization of the capacity scale-up is typically driven firstly by the health needs of Gaza society, and secondly what can be easily fixed to make the facilities functional.

Moreover the plan involves increasing the number of field hospitals, especially those provided by international donors. The focus is also on utilizing alternative service delivery methods such as mobile clinics and using telehealth platforms to leverage the expertise of global clinical professionals. Assuming a de-escalation in conflict, the goal is to increase the healthcare workforce by enlisting volunteers willing to participate in care delivery. In addition, the phase includes streamlining the processes for the entry and distribution of essential medical supplies and devices. This measure is expected to significantly improve the efficiency of healthcare services.

Building Block	Focus Area
Service Delivery	<ul style="list-style-type: none"> • Scale-up delivery of 92 prioritized healthcare interventions: through increased number of mobile clinics, increased number of physicians supporting care delivery via telehealth platforms, increase number of agreements with donor countries for medical repatriation.
Health Workforce	<ul style="list-style-type: none"> • Expand healthcare workforce capacity: facilitation of willing volunteers to embark on emergency healthcare deployments to Gaza upon any ease of blockade. • Enhance healthcare workforce capability: delivery of relevant training courses to existing healthcare workforce to enhance capabilities (e.g. in trauma care), plan for the reactivation of medical schools and public health institutes.
Health Information Systems	<ul style="list-style-type: none"> • Establish working group to centralize health data operations: unify key actors (i.e. civil society, volunteers, healthcare facilities) under the umbrella of MoH to collect and analyze real-time data in order to define future interventions.
Access to Essential Medicines	<ul style="list-style-type: none"> • Lessen reliance on WHO emergency medical kits: through establishing more suitable strategies for supply of crucial medicines and medical devices with international donors.
Health Financing	<ul style="list-style-type: none"> • Establish systematic funding model: whereby needs are clearly defined and relayed to international donors for their fiscal contributions.

Service Delivery

From a service delivery perspective at the pre-hospital level, there is scope and opportunity to contribute to the scale-up of services across various dimensions. Most prominently, some of the damaged ambulances can be restored and remobilized, while the number of operational ambulances can be increased through initiatives such as crowdfunding to fund new ambulances, as seen via an initiative by Muslims in Need⁶³ in the United Kingdom. Additionally, systems can be established to enhance and scale-up enablement services such as blood donation.

At the hospital level, the extent of damage to healthcare facilities can be assessed, and plans established to quickly alleviate issues such as reduced bed capacity and infrastructure damage. From a treatment perspective, capacity can be scaled-up across various dimensions. The pool of international physicians supporting healthcare delivery remotely via telehealth solutions can expand, more field hospitals can be established, and the number of patients (e.g., cancer patients⁶⁴) medically repatriated can increase through the signing of more agreements with foreign governments.

Health Workforce

The attention to health workforce during the Transition phase will be two-fold, centered around capacity expansion and capability enhancement. Volunteer programs can be designed in collaboration with international NGOs to ensure facilitation of willing volunteers to embark on emergency healthcare deployments to Gaza, upon any ease of the blockade. Training programs will also be provided (either virtually, or in Gaza subject to the blockade easing) by international organizations to enhance the capability of the existing healthcare workforce in Gaza. Vital training could include WHO's training in mass casualty management and trauma care amid armed conflict, the Henry Ford Global Health Initiative, and the Wayne State University Center for Emerging and Infectious Diseases training in Public Health, Laboratories and Infection Management.⁶⁶

To ensure the protection of healthcare staff, including international volunteers, several measures can be considered. These include providing comprehensive security briefings to educate individuals on potential risks and associated emergency procedures, conducting regular training sessions and drills on security protocols, and establishing robust communication systems to liaise with relevant authorities during emergencies or security risks.

During the Transition phase, planning for the future reactivation of medical schools and public health institutes will be crucial. This will develop medical students capable of contributing to the reconstruction of Gaza's healthcare system through active practice in the future. Supporting medical schools and public health institutes in Gaza may involve activating secondments of renowned international healthcare lecturers to enhance existing capacity and knowledge.

Health Workforce

Assuming the blockade ends, international organizations will have an increased footprint in Gaza and be able to contribute to the service delivery and scale-up, resulting in an enriched pool of information and data. Civil society in Gaza must coordinate to ensure that robust systems are in place for the collection of accurate, quality data (e.g., on patient diagnoses, therapeutic interventions, hospital stock-levels, etc). A centralized working group consisting of representatives from civil society, healthcare facilities and volunteers (under the supervision of the MoH) should be established to centralize data operations and analyze real-time data. This initiative can actively contribute to a set-up of macro-level information management systems which can be used to design future interventions in support of Gaza's healthcare system (e.g., defining immediate medical supply needs).

Access to Essential Medicines

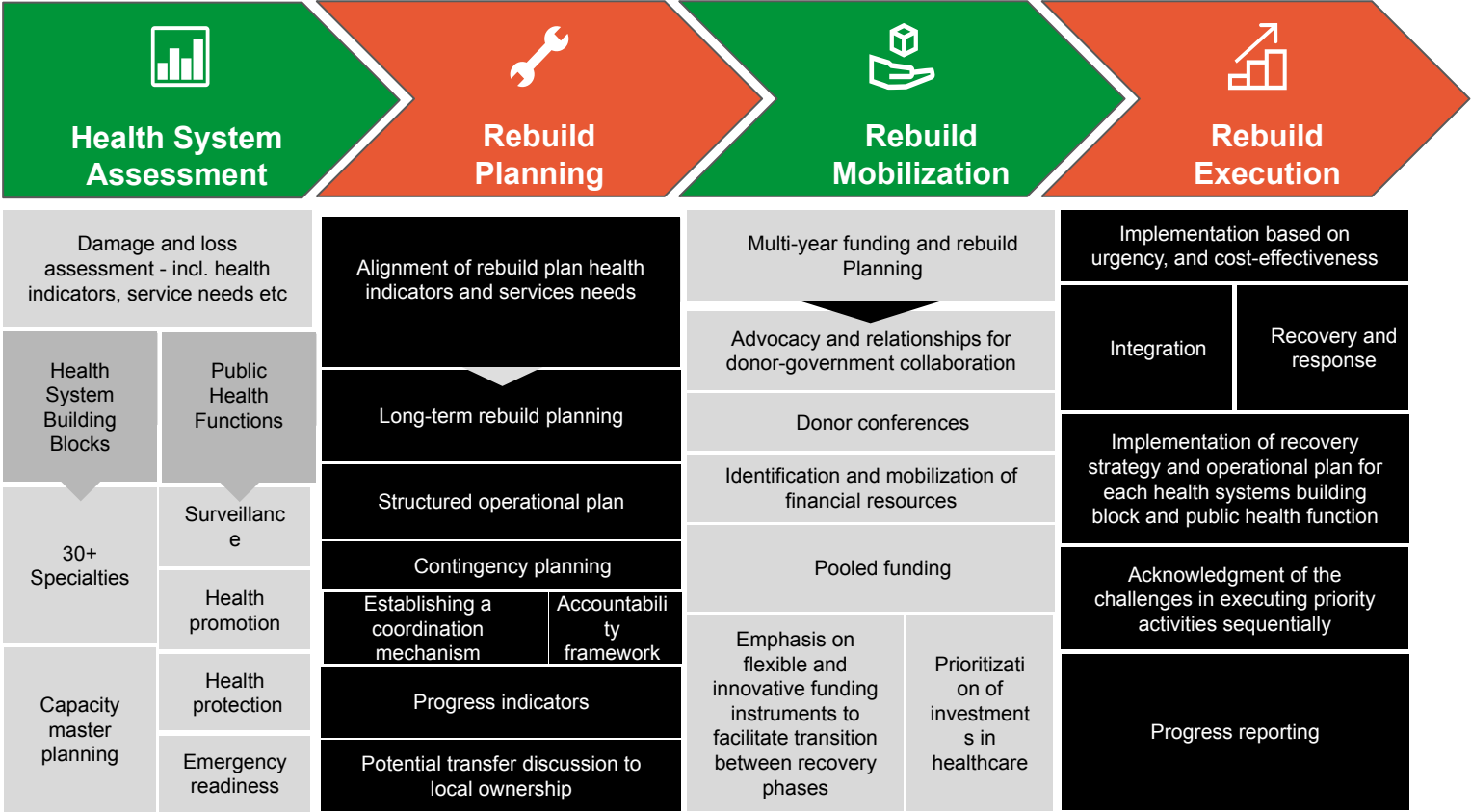
Reliance on the WHO emergency medical kits will lessen as more sustainable strategies are established, ensuring adequate quantities of medical supplies including devices in Gaza. These include longer-term agreements with international donors to equip Gaza with a suitably diverse medical inventory for a period withstanding beyond 3 months (e.g., potentially aiming for between 6-9 months). To ensure that healthcare facilities in Gaza benefit from this enhanced medical inventory, a robust distribution system should be designed to track, transport and distribute medical supplies to healthcare facilities with minimal delays, contributing to the scale-up of clinical service delivery. Furthermore an active study or facility level data collection can enable a fast-tracked update on the essential needs of Gaza's society.

Phase 3: Rebuild

Establishing a fit-for-purpose health system necessitates a meticulously planned Rebuild roadmap. This task is rendered challenging by the uncertainties associated with health indicators, the condition of the infrastructure, and the geographical configuration, which are all consequences of post-conflict conditions. Such uncertainties may introduce contextual complexities, potentially resulting in fragmented or incoherent efforts towards the reconstruction of the health system. Consequently, the objective of the Rebuild phase is to articulate a coherent strategy and provide a pragmatic, action-oriented framework.

The ultimate objective of this phase is about enhancing the system's resilience and sustainability, thereby ensuring that it emerges more robust and intelligent than before. This involves the development of care models that are both anticipatory and adaptable to the evolving health needs of the population. Within the framework of Gaza's healthcare system reconstruction, our proposed strategy advocates for a blueprint that guarantees equitable access, superior quality, fiscal judiciousness, and sustained viability. Essential to this reconstruction is a commitment to infrastructure preparedness, necessitating a substantial foundation for primary healthcare facilities, consultation spaces, and related infrastructure.

Two potential paradigms for rebuilding the health system in Gaza can be considered. First, the restoration of the pre-existing health system as it stood prior to the disruptions of 7 October, without regard to developmental requisites and prevailing conditions; and second, reconstitution in accordance with international benchmarks, tailoring the system to provide seamless, quality care delivery. The latter approach is advocated, aiming for progressive expansion models.



Indicative Based on WHO's Implementation guide for health systems recovery in emergencies (2020)

However, our reconstruction approach employs a systematic methodology that includes a comprehensive assessment of the health system, strategic planning, the mobilization of necessary resources, and the execution of the reconstruction phase, which entails multi-sectoral operations. This strategic roadmap advises a particular focus on prioritizing healthcare specialties and services, developing an overarching capacity masterplan to determine healthcare needs of the population and adhering to its guiding principles throughout the reconstruction effort.

Service priorities need to be assessed based on the damage and health indicators. As the conference organizers, an initial list of clinical and surgical specialties were identified that guide the rebuild journey, with dedicated subgroups under each bringing extensive clinical expertise.

Table 10: Clinic and Surgical services for Rebuilding a Healthcare System

General Specialistes		
Cardiothoracic Surgery	Rehabilitation	Primary Care
General Surgery	Pharmacy	Disaster Medicine
Gynecology and Obstetrics	Emergency	Disability
Neurological Surgery	Clinical Pharmacy in EM	Human Resources
Ophthalmic Surgery	Orthopedics	Cardiology
Oral and Maxillofacial Surgery	Dentistry (outpatient)	Digital Health
Orthopedic Surgery	Telemedicine	Infectious Disease
Otorhinolaryngology	Women's and Maternity Health	Laboratory
Pediatric (Surgery & Medicine)	Women's Health	Cardiology Labs
Plastic and Maxillofacial Surgery	Public Health	Mental Health
Urology	Anesthesia	Cath Lab
Vascular Surgery	Wound Care	HER
Trauma Surgery	Outpatient Clinics	Nephrology
Ophthalmology	Radiation Oncology	IT and EMR

**Service prioritization is based on health determinants*

Furthermore, the Rebuild phase aims for a well-functioning health system for Gaza built on trained and motivated health workers, well-maintained infrastructure, and a reliable supply of medicines and technologies, backed by adequate funding, strong health plans and evidence-based policies. As such, a non-exclusive list of health system strengthening indicators have been identified to guide the roadmap around health system rebuild.

Table 11: SAMPLE Health System Strengthening Indicators

Health system building block element*	Pre 7th October	Rebuild goal
Governance		
Legislation passed on Universal Health Coverage (UHC)	Data not available <i>(WHO 2017)</i>	Yes
Service Delivery		
Hospital density per 100,000 population	1.59	<i>(to be estimated as part of the capacity plan)</i>
Hospital beds per 1,000 population	1.68	4.4 <i>(average amongst OECD countries in 2019)</i>
Average number of operational ambulances	Data not available	1 ambulance per 50,000 people ⁶⁷ <i>(WHO recommendation)</i>
Health Workforce		
Workforce capacity per 1,000 population	Physicians: 15.2	Physicians: 20.7
	Nurses and midwives: 22	Nurses and midwives: 70.6
	Dentists: 1.1	Dentists: 8.2
	Pharmacists: 16.5	Pharmacists: 16.5 (maintain) <i>(estimated figures to achieve 80/100 on the UHC Effective Coverage Index)</i>
Access to Essential Medicines		
Median availability of selected medical devices across healthcare facilities <i>(as per WHO lists of priority medical devices⁸⁶)</i>	Data not available	80-100%
Median availability of selected generic medicines (%)	Data not available	80% ⁶⁹ <i>(WHO recommendation for 2025)</i>
Health Information Systems		
Healthcare facilities using Electronic Health Records (%)	Data not available	81.2% ⁷⁰ <i>(2020) (USA Hospitals*)</i>
Civil registration coverage of births (%)	Data not available	100% ⁷¹ <i>(2021) (USA*)</i>
Civil registration coverage of cause-of-death (%)	Data not available <i>(WHO latest data)</i>	100% ⁶⁶ <i>(2021) (USA*)</i>
Health Financing		
Current health expenditure per capita in US\$	383.9 <i>(2019)</i>	4,000 ⁷² <i>(2019, average of OECD countries)</i>
Current health expenditure as a percentage of gross domestic product (GDP) (%)	10.4% <i>(Palestine figure, data not stratified to Gaza-level)</i>	16% ⁷³ <i>(2021) (USA*)</i>

*Data from the USA serves as a benchmark illustrating exemplary standards, but may not necessarily represent a realistic goal for Gaza

These indicators must be integrated within the overarching capacity master plan, which will elucidate the requisite number of facilities, aligned with the findings of the Jordan Engineering Association who will conduct a thorough assessment of the needs. This integration is crucial to ensuring that the healthcare needs of Gaza are adequately addressed through the allocation of hospitals, primary care clinics, specialty clinics, urgent care centers, long-term care facilities, rehabilitation centers, mental health facilities, and diagnostic centers (refer to appendix for sample approach).

Rebuilding the primary healthcare infrastructure is a critical step in meeting future healthcare needs of Gaza. Such an initiative, tailored to the economic and healthcare requirements of the Gazan population, has the potential to reduce overall healthcare costs while simultaneously raising the health standards and making healthcare services more accessible. Essentially, a well-organized primary healthcare system is fundamental to providing continuous and coordinated healthcare delivery, including preventive measures and health promotion.

On another level, the Public Health Working Group of the Conference articulates that mere reconstruction of medical infrastructure is inadequate. The Group highlights that only 10% to 20% of health outcomes are attributable to healthcare services, with the bulk being influenced by broader social, economic, environmental, educational, and political determinants of health. Consequently, the working group advocates for the prioritization of a comprehensive public health infrastructure during the reconstruction phase. This encompasses critical areas such as ensuring access to nutrition and clean water, addressing chronic diseases like cancer, diabetes, and cardiovascular ailments, and managing physical and mental injuries. A coherent response strategy and concerted efforts towards health system rehabilitation is therefore essential. Given the scale of conflict-related injuries on the youth population of Gaza, there will likely be a high incidence of resulting disabilities, which will impose a considerable strain on Gaza's future healthcare system. To mitigate this challenge and foster a robust health system capable of withstanding future adversities, the implementation of comprehensive public health functions is imperative.⁷⁴

Consequently, to facilitate a robust rebuild of Gaza's healthcare landscape, the foundational pillars of the future health system must encompass preventive care, integrated care delivery, quality and health equity, and resilience.

Gaza Health System Rebuild principles

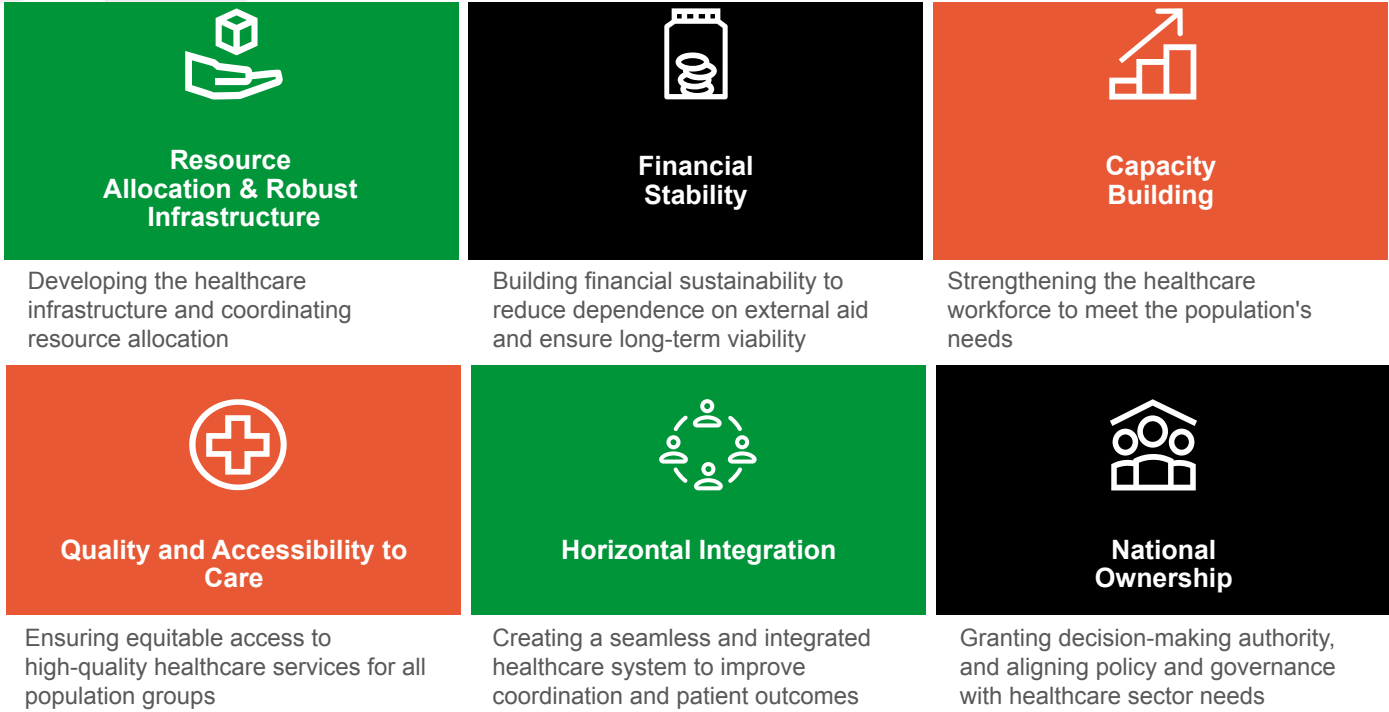
 <p>Universal Coverage</p> <p>Guarantees comprehensive healthcare access for every individual, whilst encompassing the full spectrum of health services from preventive to palliative care.</p>	 <p>Sustainable Financing</p> <p>Ensures enduring, ample funding without imposing excessive economic strain on residents.</p>	 <p>Preventive Care and Public Health Emphasis</p> <p>Focuses on prophylactic care underscored by immunization & interventions targeting the social determinants of health.</p>
 <p>Integrated Care</p> <p>Facilitates an integrated network of care, straddling primary, secondary, and tertiary levels, in tandem with social services, to ensure a holistic approach to patient care, notably for chronic conditions and geriatric populations.</p>	 <p>Quality Care</p> <p>Fosters premier medical services with adept healthcare professionals, avant-garde medical technology and protocols</p>	 <p>Health Workforce Development</p> <p>Fosters workforce capacity and capability through education and skill enhancement</p>
 <p>Digital Health Infrastructure</p> <p>Incorporates technological tools like electronic health records, telemedicine, and artificial intelligence in diagnostic and therapeutic procedures to enhance efficiency.</p>	 <p>Health Equity</p> <p>Addresses and rectifies health inequities, guaranteeing that all societal segments, particularly the vulnerable</p>	 <p>Resilience</p> <p>Operates with agility to respond effectively to health crises</p>

Refer to the *Appendix for the Dimensions of Resilience Governance Framework (K Blanchet et al.)*

Phase 4: Sustain

Rebuilding the healthcare system in Gaza is aimed at achieving self-sustainability. Given the unpredictable durations of conflict, it requires a flexible and adaptive post-conflict reconstruction approach. This ideal outcome involves principles that encompass the multidimensional aspects of rebuilding a healthcare system, emphasizing the transfer of ownership to the local community, ensuring financial sustainability, and initiating a journey toward maturity based on local dynamics.

Six overarching principles have been identified to guide the process of self-sustainability covering infrastructural elements, financial, local know-how, quality standards customized based on the local needs and efficient health system integration.



Resource Allocation & Robust Infrastructure - Ensures coordinated timing and allocation of available resources that are both important to long-term sustainability. Effective stewardship of these resources is indispensable to maximize utility and curtail redundancy, especially within the resource-constrained environment of Gaza.

Financial Stability - Ensures continuous self-funding that facilitates maintenance of healthcare operations, infrastructure, and the provision of essential healthcare services. This is particularly salient for Gaza, where economic resilience is vital for the continuity of health services amidst ongoing conflict.

Capacity Building - Covers strengthening the healthcare workforce and infrastructure to effectively meet the diverse needs of the population. By focusing on both government and non-state providers, capacity building extends to enhancing specialized care and building resilience within the healthcare system. In the context of Gaza, this involves empowering both governmental and non-governmental health entities to augment specialized care in critical areas.

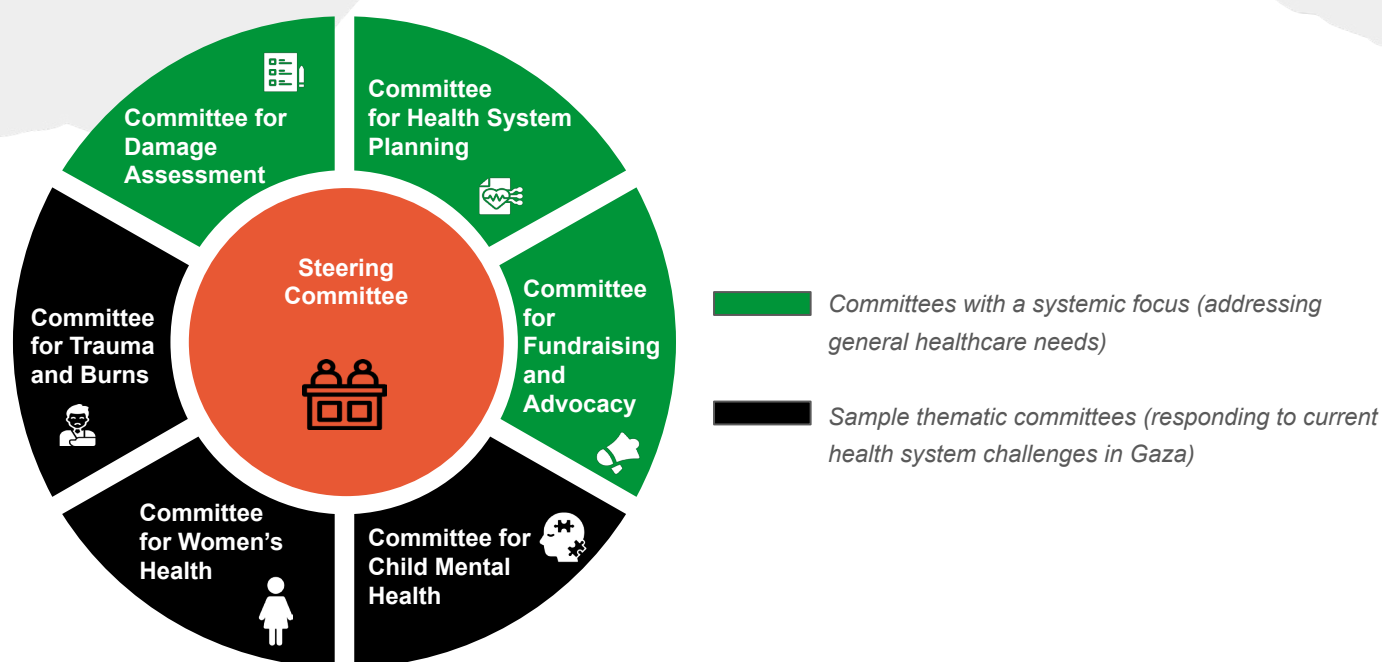
Quality and Accessibility to Care - Involves potential measures such as extending primary healthcare services to underserved areas and leveraging telemedicine and technology to enhance accessibility. Such efforts will be critical in Gaza to bridge health service gaps, advance health parity, and improve health indices for all societal factions.

Horizontal Integration - Involves partnering health services operating at the same or similar levels to maximize synergies, and improve the patient care experience, quality and efficiency. Covers clustering model which ensures a more integrated care delivery. The adoption of such a model in Gaza could streamline care coordination and optimize resource utilization across the healthcare continuum.

National Ownership - Involves actively engaging national and local health authorities in the planning, execution, and monitoring of sustainable recovery initiatives. This establishes a basis for robust policy and governance that aligns with the distinctive needs and priorities of the nation's healthcare sector. For Gaza, this advocates for the creation of health policies and governance frameworks that are bespoke to the region's unique healthcare requisites and aspirations.

Part 4:

Operationalizing the Future Rebuild of Gaza's Health System



This report acknowledges that its foundational assumptions and aspirational objectives are based on the best practices and evidence concerning the state of Gaza's healthcare system prior to 7 October 2023. Due to the ongoing conflict, the magnitude of the challenges ahead is unpredictable.

To accurately assess the healthcare needs in Gaza, a comprehensive on-site evaluation will be necessary. In the meantime, this report offers a preliminary survey of past reconstruction initiatives in Gaza and identifies recurring challenges. These include difficulties caused by the blockade, and the cyclic nature of conflicts that escalate in frequency, resulting in insufficient recovery intervals and resources. Additionally, there are challenges related to the internal healthcare system's capacity and demands, which are influenced by social determinants such as elevated incidences of war-related injuries, psychological aftereffects, disabilities, educational disruption, high unemployment rates, and conditional aid that further hampers rehabilitation efforts.^{75,76}

One of the options would be a collaborative reconstruction approach, as highlighted by Sultan Barakat and Omar Shaban,^{77,78} in their reports, establishing a full fledged Reconstruction Council that would be responsible for both the facilitating and managing the reconstruction.

Furthermore, the operationalization of the Health System Rebuild Journey necessitates proactive planning through the establishment of a fully functional health system within Gaza. In addressing this complex question, it is imperative to consider the multifaceted scenarios presented by the ongoing conflict, which include the demographic dynamics, the geographical terrain, the state of the existing infrastructure, as well as broader implications such as the prevailing occupation and blockade. These factors will undoubtedly have a profound influence on the implementation of the health system rebuild framework.

To translate this framework into actionable steps, we have delineated three foundational elements for consideration:

First, the formation of two types of committees structured as working groups with distinct remits is essential. The committees would cover either a specific technical component of the rebuild (such as strategy planning, funding, damage assessment) or thematic (mental health, trauma and burns, women's health).

- 1.1 A Steering Committee:** Tasked to operate as an overarching group that oversees the strategic planning of the assessment and the rebuild roadmap. Consists of technical, policy making and academic backgrounds that ensure clear strategic roadmap for the rebuild
- 1.2 A Committee for Damage Assessment:** Tasked with the procurement of accurate and exhaustive data regarding the extent of infrastructural damage. This committee should include engineers and technical experts capable of conducting a thorough analysis, identifying sectors that necessitate immediate intervention and prioritization.
- 1.3 A Committee for Health System Planning:** This should be an assembly of subject matter experts who will articulate strategies for the health system's strategic trajectory, including undertaking cost analysis exercises to project financial requirements.
- 1.4 A Committee for Fundraising and Advocacy:** Responsible for mobilizing resources and advocating for the health system's reconstruction at various levels.
- 1.5 A Committee for Child Mental Health:** Dedicated to evaluating and developing interventions for children's mental health issues, with a focus on early prevention strategies.
- 1.6 A Committee for Women's Health:** Tasked to assess and address the diverse needs of women's health with a commitment to improving health outcomes through advocacy, capacity building and information campaigns.
- 1.7 A Committee for Trauma and Burns:** Responsible for conducting local needs assessments and prioritizing interventions relating to trauma and burn injuries.

Second, the roadmap for the reconstruction of the health system in Gaza should include robust advocacy at the state level, as well as engagement with international entities such as the United Nations. This can involve creating policy briefs, organizing dialogues and partnerships, and mobilizing international support.

In addition, building active partnerships and networks is crucial to ensuring a broader spectrum of perspectives. These collaborations are essential for enhancing the technical and scientific rigor required for the health system's reconstruction.

This kind of systematic approach, informed by contextual realities, strategic planning, and collaborative effort, will be necessary to establish a resilient and accessible health system for Gaza.

Conclusion

The process of creating and implementing a framework to rebuild the health system in Gaza is a complex challenge that involves multiple aspects. The subject has consistently been at the forefront of scholarly discourse, presenting a multitude of theoretical debates and practical risks being identified across diverse geographical contexts.

This report acknowledges that there are potential dangers associated with post-conflict scenarios in Gaza, particularly in relation to the uncertainties surrounding the region's infrastructure, demographic changes, and prevailing health issues that have been significantly affected by the conflict. Therefore, it outlines a structured, phase-based reconstruction model, encompassing four distinct stages and aligns the process with the World Health Organization's (WHO) six building blocks model. This approach advocates a focus on critical areas such as service delivery, human resources, information systems, and medical supplies, ensuring a holistic and effective rebuilding strategy.

Moreover, the report recommends expanding research findings by collecting primary data from Gaza's stakeholders. This approach is crucial for validating the identified needs and ensuring the alignment of the reconstruction efforts with the existing ecosystem. The strategy emphasizes the importance of building upon existing structures and resources, rather than initiating an entirely new framework from scratch.

The report also outlines the operational needs necessary for implementing this strategic roadmap and suggests establishing specialized committees responsible for conducting damage assessments, planning the health system, and coordinating fundraising efforts. These committees are vital for collecting key data, devising strategic plans for health system development, and securing the necessary financial resources.

Finally, the report stresses the importance of robust advocacy at both national and international levels. It highlights the need for partnerships with global entities like the United Nations to garner support. Effective dialogue and collaboration with international partners are essential for securing international backing, which is crucial for a scientifically rigorous and robust approach to the reconstruction of Gaza's health system.

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Appendix

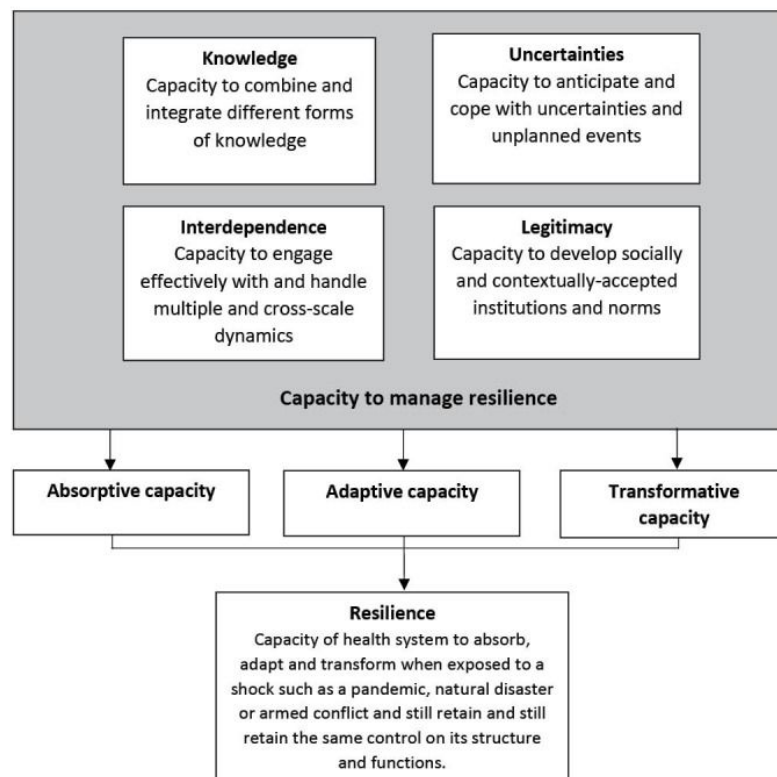
A. Prioritized list of health interventions for Gaza

Programme area	Intervention
Maternal and newborn health	Antenatal care
Maternal and newborn health	Early detection and management of syphilis, hypertension, pre-eclampsia, diabetes and other pregnancy complications
Maternal and newborn health	Detection and treatment of bacteriuria
Maternal and newborn health	Tetanus immunization
Maternal and newborn health	Basic emergency obstetric care
Maternal and newborn health	Assisted vaginal delivery (including vacuum extraction)
Maternal and newborn health	Administering antibiotics, uterotonic drugs oxytocin and anticonvulsants (magnesium sulfate)
Maternal and newborn health	Manual removal of the placenta
Maternal and newborn health	Removal of retained products following miscarriage or abortion
Maternal and newborn health	Comprehensive emergency obstetric care
Maternal and newborn health	Surgery (eg, cesarean sections, hysterectomy)
Maternal and newborn health	Safe blood transfusion
Maternal and newborn health	Forceps extraction, if properly trained
Maternal and newborn health	Antenatal corticosteroid for preterm labor, including early detection and referral at health centers
Maternal and newborn health	Induction of labor (beyond 41 weeks)
Maternal and newborn health	Management of pregnancy induced hypertension, including pre-eclampsia/eclampsia
Maternal and newborn health	Ectopic pregnancy case management
Maternal and newborn health	Management of maternal sepsis
Maternal and newborn health	Basic neonatal care
Maternal and newborn health	Basic neonatal resuscitation care (with bag and mask)
Maternal and newborn health	Thermal protection for all babies, especially preterms
Maternal and newborn health	Hygienic cord care
Maternal and newborn health	Kangaroo mother care and additional feeding support (eg, with nasogastric tube/cup feeding) for small preterm babies
Maternal and newborn health	Comprehensive neonatal care
Maternal and newborn health	Management of newborn complications, neonatal meningitis and other very serious infections
Maternal and newborn health	Neonatal acute respiratory infection detection and treatment (intravenous antibiotics, oxygen therapy and respiratory support)
Maternal and newborn health	Newborn sepsis-injectable antibiotics
Maternal and newborn health	Management of jaundice
Child health	Routine childhood vaccines (diphtheria, pertussis, tetanus, polio, Bacillus Calmette-guerin (BCG), measles, hepatitis B, Hib, rubella)
Child health	Pneumococcus vaccination
Child health	Rotavirus vaccination
Child health	Tetanus toxoid immunization among schoolchildren
Child health	Integrated community case management of childhood illness
Child health	Integrated management of childhood illness
Child health	Full supportive care for severe childhood infections

Infections in general*	Pharyngitis treatment
Infections in general*	Fever evaluation and basic management, clinically stable, WHO Integrated Management of Adolescent and Adult Illness/Integrated Management of Childhood Illness (IMAI) guidelines, with referral of unstable individuals
Infections in general*	Fever evaluation and comprehensive management, clinically unstable, WHO IMAI guidelines
Infections in general	Refractory febrile illness including etiologic diagnosis
Cardiovascular and related disorders (metabolic disorders, kidney failure, etc)	Cardiovascular disease (CVD), primary prevention with absolute risk approach (antihypertensives, statins)
Cardiovascular and related disorders (metabolic disorders, kidney failure, etc)	CVD, secondary prevention (aspirin, beta blockers, ACE inhibitors, statins)
Cardiovascular and related disorders (metabolic disorders, kidney failure, etc)	Secondary prophylaxis for rheumatic fever or established rheumatic heart disease, penicillin
Cardiovascular and related disorders (metabolic disorders, kidney failure, etc)	Active case finding and management of diabetes (glycaemic control, antihypertensives, statins, and consistent foot care)
Cardiovascular and related disorders (metabolic disorders, kidney failure, etc)	Management of heart failure (diuretics, beta-blockers, ACE inhibitors, and mineralocorticoid antagonists)
Cardiovascular and related disorders (metabolic disorders, kidney failure, etc)	Management of acute heart failure
Cardiovascular and related disorders (metabolic disorders, kidney failure, etc)	Aspirin for all cases of suspected acute myocardial infarction
Mental health disorders	Active case finding of psychosis, depression, anxiety, bipolar disorder and post-traumatic stress disorder (PTSD)
Mental health disorders	Management of depression and anxiety
Mental health disorders	Management of PTSD
Mental health disorders	Management of bipolar disorder
Mental health disorders	Management of psychosis (schizophrenia)
Mental health disorders	Management for attention deficit hyperactivity disorder
Mental health disorders	Basic psychosocial follow-up for suicide and self harm
Surgery	Drainage of abscess
Surgery	Drainage of dental abscess
Surgery	Management of bowel obstruction
Surgery	Appendectomy
Surgery	Colostomy
Surgery	Hernia repair
Surgery	Management of osteomyelitis
Surgery	Repair of peptic ulcer perforations
Surgery	Urinary catheterisation/suprapubic cystostomy
Emergency care	First aid
Emergency care	Basic life support and first aid for burns, bleeding and wounds and choking
Emergency care	Basic emergency care
Emergency care	Management of non-displaced fractures
Emergency care	Resuscitation with basic life support measures
Emergency care	Identify and refer patients with high risk including pregnant women, young children, and those with underlying medical conditions
Emergency care	Advanced emergency care
Emergency care	Suturing laceration
Emergency care	Traction for fractures
Emergency care	Irrigation and debridement of open fractures

Emergency care	Resuscitation with advanced life support measures
Emergency care	Trauma laparotomy
Emergency care	Trauma-related amputations
Emergency care	Tube thoracostomy
Emergency care	Management of septic arthritis
Emergency care	Urgent orthopedic management of injuries
Palliative care and pain control	Palliative care and pain control
Palliative care and pain control	Prevention/relief of refractory suffering and of acute pain
Nutrition	Detection and referral of severe acute malnutrition
Nutrition	Vit. A and Zinc to children and food for women
Nutrition	Iron and folic acid supplementation, pregnant women, adolescent girls. Provision of food or caloric supplementation to pregnant women in food insecure households
Nutrition	Promotion of early and exclusive breastfeeding or complementary feeding
Nutrition	Treatment of severe acute malnutrition for cases presenting with or without associated medical complications (eg, Infections)
Water supply, sanitation and hygiene	WASH: establish quality WASH facilities in schools, workplaces, public spaces, and healthcare facilities
Water supply, sanitation and hygiene	WASH: targeted WASH subsidies to poor and vulnerable groups
Water supply, sanitation and hygiene	WASH: enact national standards for safe drinking water and sanitation within and outside households and institutions
Water supply, sanitation and hygiene	Media messages on handwashing and air pollution
Water supply, sanitation and hygiene	WASH behavioral change interventions, such as community-led total sanitation
Health education and behavioral change communication	Education on handwashing and safe disposal of children's stools
Health system services	Laboratory services

B. A Conceptual Framework: The Dimensions of Resilience Governance



‘Governance and Capacity to Manage Resilience of Health Systems: Towards a New Conceptual Framework’, K Blanchet et al. (2017)

C. Quantitating rebuilding needs by manpower and financing

The following appendix provides a sample approach to steps needed to Rebuild the Gaza healthcare sector by specialty. Selected specialties are included as examples.

Principles for calculations:

Number of physicians, nurses, physician extenders and ancillary manpower are calculated both per capita and per disease prevalence.

Acute care, especially in the short-term may require inpatient facilities.

War-related specific diseases and conditions, such as burns, amputations, require specialized acute and chronic care settings unprecedented in the world. The same applies to mental health conditions and particular issues caused by medication shortage (e.g., ophthalmologic overuse of steroid drops).

How to use this section:

- Look up specialty
- In that specialty, focus on already-published disease prevalence
- If none available, extrapolate to non-country specific available data
- Use office overhead cost as a base for all non-surgical specialties
- Add specialized equipment cost

*For surgical specialties, cost depends on hospital infrastructure costs, covered separately

* We recognize that not all specialties are available in adequate numbers, so provisions for training are discussed as examples as well.

If you would like to help, you can contribute to rebuilding Gaza's health system by making a donation here :

<https://www.rebuildinggazahealth.org/donate>

Or by scanning this QR code:

