

Disease risk assessment and interventions

Gaza Strip

January 2009



Communicable Diseases Working Group on Emergencies, WHO headquarters
Communicable Disease Surveillance and Response, WHO Regional Office for the Eastern
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For further information, please contact:
cdemergencies@who.int

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1. Context

The Gaza Strip, on the eastern Mediterranean coast between Israel and Egypt has been the setting for a protracted humanitarian crisis. It has a population of 1.5 million with the sixth highest population density in the world, and a very young demographic with 18% of the population under 5 years of age (274 000 children). Recent events have resulted in a severe exacerbation of the chronic humanitarian crisis.

As of 18 January, over 50 896 people had been newly displaced and were residing in 50 shelters organised by the United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA). It is estimated that there may be an additional tens of thousands of displaced people, mainly sheltering with host families. As of 18 January, the Ministry of Health of the Palestinian Authority (MoH) reported that 1 300 people had been killed since 27 December, of whom at least 410 were children and 104 women. Over 5 300 were reported injured, including 1 855 children and 797 women.

Vital infrastructure has been severely compromised or destroyed, resulting in lack of shelter and energy sources, sudden deterioration of water and sanitation services, food insecurity, overcrowding and severely curtailed access to health services. Since 27 December 2008, at least 16 health facilities and 16 ambulances have been reported damaged and as of 14 January, 21 out of 57 MoH health facilities and 3 out of 18 UNRWA health facilities were closed (OCHA).

Those facilities that remain operational face a number of challenges, including (i) low staffing levels due to insecurity, especially in Gaza City; (ii) electricity for only a few hours per day from emergency generators; (iii) uncertain supply lines; and (iv) inaccessible health care services for most of the catchment area population, with attendance rates reported to have fallen by more than 50%.

2. Priority health issues

The risk of excess morbidity and mortality is primarily from traumatic injury or from the discontinuation of treatment for chronic conditions due to poor access to health care services. Diarrhoeal diseases currently represent the most important risk of excess morbidity and mortality from communicable diseases.

The priorities below may change should the crisis continue for an extended period.

- **Immediate treatment of traumatic injury, burns and acute surgical conditions**

The current overwhelming health concern is timely access to appropriate care for those who are injured. The nature of presenting injuries includes open wounds, blunt trauma and burns. Delays in provision of trauma and emergency surgical care and rehabilitation for the injured can increase the likelihood of complications including disability, or of death.

An adequately functioning pre-hospital emergency medical service (EMS), such as an ambulance service, and emergency rooms that are adequately staffed and equipped can significantly improve survival rates among those with life-threatening injuries and surgical conditions.

Given the context (reduced staffing, treatment delays, interruptions to electricity and limited water supplies), the risk of wound infection is high (for guidelines on surgery, and wounds and injuries, see section 5). Tetanus is of particular concern as vaccination coverage among adults is low (see Table 1). Health care workers should ensure they are suitably protected including with all appropriate vaccinations.

- **Mental disorders and psychosocial problems**

The stress and losses that occur during emergencies are a risk factor for a wide range of mental disorders, including mood and anxiety disorders (such as post-traumatic stress disorder). WHO projects that the long-term effects of emergencies can increase the number of people with severe mental disorders by an average of 1% above baseline and those with mild and moderate mental disorders by an estimated 5-10% above baseline. Much of the affected population is also likely to be burdened by a wide range of symptoms of distress and other psychosocial problems caused by severe trauma, loss and social and living conditions.

- **Continued treatment and care for chronic conditions**

Prior to recent events, non-communicable disease was the leading cause of death in the Gaza Strip. Surveys indicate a 9% prevalence of diabetes mellitus among the adult population. In 2007, UNRWA treated approximately 34 000 hypertensive and 23 000 diabetic patients in the territory (a total of 45 000 patients taking into consideration an overlap of the conditions), with a prevalence in the adult population of 17% and 12% respectively. Among these patients, about 7 000 were receiving insulin therapy and 22 000 were taking hypertension drugs; 23% of patients with hypertension and/or those with diabetes (10 000) were considered to be at high risk of complications and death. Among these patients, the two groups considered to be at highest risk are the young insulin dependent diabetic patients with severe hypertension, and those on renal dialysis. These patients are only able to tolerate an interruption of therapy for 4-5 days in the first case and a maximum of one week in the second.

- **Communicable diseases**

Risk of diarrhoeal disease outbreaks may increase with protracted disruption to water and sanitation services. Risk of outbreaks of vaccine-preventable diseases is currently low, given high reported vaccine coverage, with the exception of tetanus vaccination among adults. However this may change if vaccination programmes are disrupted for protracted periods.

3. Priority communicable diseases

- **Waterborne and foodborne diseases**

The risk of outbreaks of waterborne and foodborne diseases is currently high and will increase if water, sanitation and food control services are not restored, or are allowed to deteriorate further. The main pathogens of concern are *Campylobacter*, *Salmonella*, *Shigella*, *Leptospira*, rotavirus, as well as other enteropathogens such as *Entamoeba histolytica* and hepatitis A and E¹. Typhoid fever, reports of which increased in the Gaza Strip in 2007², is also a concern. Cholera has not been reported in the territory since 1992.

Currently, 55 out of 145 wells in the Gaza Strip are not functioning and 80% of the water supply in the territory is estimated to be unsafe for drinking (OCHA). Sewage treatment has been disrupted and sewage has been reported in the streets of Beit Hanoun and Beit Lahiya. Monitoring of water quality has stopped since 4 January 2009, following the closure of the Public Health Laboratory.

- **Vaccine-preventable diseases**

Vaccination programmes have ceased as of 27 December 2008. However, given the high reported routine vaccination coverage prior to that date (Table 1), with the notable exception of tetanus coverage in adults, the risk of measles, polio, diphtheria, and pertussis outbreaks is currently low.

The main risk is from tetanus resulting from trauma (inadequately treated wounds and burns) and from maternal and neonatal tetanus (MNT) following unsafe deliveries. Tetanus vaccination coverage in adults is low and protection is known to wane with age. The incubation period is usually 3–21 days, and the case-fatality ratio (CFR) is 70–100%. (For prevention and management of tetanus, see Section 5).

Currently there are about 1 200 births per week in the Gaza Strip (UNFPA - OCHA Field Update 16/01/09). Many of the newborns are not receiving routine vaccinations in line with Expanded Programme on Immunization (EPI) schedules. Un-immunized children will require catch-up vaccination doses once the EPI activities are able to resume. If disruption to EPI services is of short duration (i.e. a few weeks), it is unlikely that vaccination coverage will dip below the herd immunity thresholds. However, the Gaza Strip is a very densely populated area which requires greater levels of

¹ Exclusive breastfeeding should be encouraged. The most appropriate alternative for infants dependent on a breast milk substitute (BMS) is ready-to-use infant formula is most appropriate as it does not require mixing with water.

² UNRWA Health Report 2007. http://www.un.org/unrwa/publications/pdf/ar_health2007.pdf
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Communicable Disease Working Group on Emergencies (CDWGE-WHO/HQ);
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herd immunity, and therefore higher vaccination coverage, than less densely populated areas. If vaccination programmes are suspended for a protracted period, accumulating birth cohorts of un-immunized children will result in lowered vaccination coverage levels, placing the entire community at risk of outbreaks of vaccine-preventable diseases.

Table 1. Routine vaccination coverage at one year of age, 2006, West bank and Gaza*

Antigen	% coverage*
(BCG) bacille Calmette–Guérin	99
Diphtheria–pertussis–tetanus, 3rd dose	96
Hepatitis B, 3rd dose	97
MCV (measles-containing vaccine)	99
Polio, 3rd dose	96
Tetanus (women of childbearing age)	42

*Official estimates reported to WHO/UNICEF, as of 14 January 2009.

- **Acute Respiratory Infections (ARI) including pneumonia**

Children and newborns are particularly at risk from ARI and have an increased risk of death from pneumonia. The main risk factors include crowding, poor ventilation, indoor smoke, malnutrition and lack of breast-feeding. The disruption of EPI services also means fewer babies receive supplements of vitamin A, a highly effective preventive intervention against ARI. Acute malnutrition is a major contributing factor to morbidity and mortality from communicable diseases such as ARI, particularly in children. Micronutrient deficiencies, especially iron deficiency anaemia and vitamin-A deficiency, remain public health problems in the Gaza Strip³.

- **Tuberculosis (TB)**

Between 20 and 25 new TB cases are reported annually from the Gaza Strip. Untreated active pulmonary TB carries a case fatality ratio (CFR) of 65% within 5 years. In the acute phase of this emergency, the main concern for TB programmes is the continuation of treatment which is likely to be hampered by drug supply problems and loss of contact with patients.

- **Avian influenza A(H5N1)**

Highly pathogenic A(H5N1) was reported in poultry in the Gaza Strip in 2006. No human cases have been reported to date.

- **HIV/AIDS**

The prevalence of HIV in the Gaza Strip is low. No new AIDS cases were reported in 2007⁴.

- **Malaria**

There is no risk of malaria in the Gaza Strip.

A functioning communicable disease surveillance system was in operation prior to June 2006. This has since deteriorated and ceased functioning as of 27 December 2008.

³ UNRWA Health Report 2007. http://www.un.org/unrwa/publications/pdf/ar_health2007.pdf

⁴ UNRWA Health Report 2007. http://www.un.org/unrwa/publications/pdf/ar_health2007.pdf
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4. Priority interventions

Interventions to reduce morbidity and mortality in the Gaza Strip are fundamentally dependent on patients' ability to access health care, which is at present severely compromised.

- **Provide emergency medical and surgical care** for traumatic injury, burns and life threatening surgical conditions. Ensure appropriate wound management including tetanus prophylaxis.
- **Ensure the continuation of treatment of chronic conditions** for those on medications including TB, hypertension, diabetes and kidney disease. Where feasible, decentralization of care will increase treatment coverage given the restrictions on movement.
- **Provide support for mental health and psychosocial disorders.**
 - Include specific psychological and social considerations in provision of general health care;
 - provide psychological first aid to people with severe, acute anxiety;
 - ensure continued access to care for people with severe mental disorders.
- **Provide sufficient safe water**, sanitation and reinforced hygiene measures for infection control.
- **Establish and maintain an effective mechanism for communicable disease surveillance and response** to detect and respond to outbreaks, with particular focus on diarrhoeal diseases.

5. Information Sources

WHO headquarters and WHO Regional Office for the Eastern Mediterranean/EMRO

Communicable Disease Surveillance and Response, WHO/EMRO

<http://www.emro.who.int/csr/>

Disease control in humanitarian emergencies (DCE), WHO/HQ

http://www.who.int/diseasecontrol_emergencies/en/

Health Action in Crises (HAC), WHO/HQ

<http://www.who.int/hac/en/>

Avian and Pandemic Influenza

Avian influenza

http://www.who.int/topics/avian_influenza/en/

Pandemic influenza preparedness and mitigation in refugee and displaced populations. Second edition
May 2008. (pdf -550 kb)

http://www.who.int/diseasecontrol_emergencies/WHO_HSE_EPR_DCE_2008_3web.pdf

Child health in emergencies

Emergencies documents

http://www.who.int/child_adolescent_health/documents/emergencies/en/index.html

Pocket book of hospital care for children

http://www.who.int/child_adolescent_health/documents/9241546700/en/index.html

Acute respiratory tract infections in children

http://www.who.int/fch/depts/cah/resp_infections/en/

IMCI Chart Booklet (WHO; UNICEF, 2006)

http://www.who.int/child_adolescent_health/documents/IMCI_chartbooklet/en/index.html

Diarrhoeal diseases

Acute diarrhoeal diseases in complex emergencies: critical steps.

http://www.who.int/cholera/publications/critical_steps/

Cholera outbreak: assessing the outbreak response and improving preparedness

http://www.who.int/cholera/publications/cholera_outbreak/

First steps for managing an outbreak of acute diarrhoea.

http://www.who.int/cholera/publications/first_steps/

Guidelines for the control of shigellosis, including epidemics due to Shigella dysenteriae type 1

<http://www.who.int/topics/cholera/publications/shigellosis/>

Oral cholera vaccine use in complex emergencies: What next? Report of a WHO meeting. Cairo, Egypt,
14–16 December 2005. [pdf-3200kb]

http://www.who.int/topics/cholera/publications/cholera_vaccines_emergencies_2005.pdf

Background document: the diagnosis, treatment, and prevention of typhoid fever (WHO, 2003) [pdf-230kb]

http://whqlibdoc.who.int/hq/2003/WHO_V&B_03.07.pdf

Drug donations

Guidelines for Drug Donations (WHO, revised 1999) [pdf-270kb]

http://whqlibdoc.who.int/hq/1999/WHO_EDM_PAR_99.4.pdf

Environmental health in emergencies

Guidelines for drinking-water quality, third edition, incorporating first addendum

http://www.who.int/water_sanitation_health/dwq/gdwq3rev/en/index.html

Environmental health in emergencies and disasters: a practical guide

http://www.who.int/water_sanitation_health/emergencies/emergencies2002/en/index.html

WHO Technical notes for emergencies

http://www.who.int/water_sanitation_health/hygiene/envsan/technotes/en/index.html

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WHO Regional Office for the Eastern Mediterranean (EMRO), WHO Office for West Bank and Gaza.

Frequently asked questions in case of emergencies

http://www.who.int/water_sanitation_health/emergencies/qa/en/index.html

Four steps for the sound management of health-care waste in emergencies

<http://www.healthcarewaste.org/en/documents.html?id=184&suivant=25>

Food safety

Ensuring food safety in the aftermath of natural disasters

http://www.who.int/foodsafety/foodborne_disease/emergency/en/

Prevention of foodborne disease: Five keys to safer food

<http://www.who.int/foodsafety/consumer/5keys/en/index.html>

Guideline for the safe preparation, storage and handling of powdered infant formula (WHO, 2007)

<http://www.who.int/foodsafety/publications/micro/pif2007/en/index.html>

Gender & gender-based violence

IASC Guidelines for Gender-based Violence Interventions in Humanitarian Settings (2005) [pdf-1900kb]

<http://www.humanitarianinfo.org/iascweb2/downloaddoc.aspx?docID=4435&type=pdf>

IASC Gender Handbook in Humanitarian Action Women, Girls, Boys and Men Different Needs – Equal Opportunities (2006) [pdf-3200kb]

<http://www.humanitarianinfo.org/iascweb2/downloaddoc.aspx?docID=4496&type=pdf>

Clinical management of rape survivors: Developing protocols for use with refugees and internally displaced persons. 2004 - Revised edition (WHO/UNHCR)

http://www.who.int/reproductive-health/publications/clinical_mngt_rapesurvivors/

Hepatitis

Hepatitis A

<http://www.who.int/csr/disease/hepatitis/whocdscsre2007/en/>

<http://www.who.int/immunization/documents/positionpapers/en/index.html>

Hepatitis E

<http://www.who.int/csr/disease/hepatitis/whocdscsre200112/en/>

<http://www.who.int/mediacentre/factsheets/fs280/en/>

HIV/AIDS

Guidelines for HIV/AIDS interventions in emergency settings: Interagency Standing Committee guidelines

www.who.int/3by5/publications/documents/iasc/en/

Laboratory specimen collection

Guidelines for the collection of clinical specimens during field investigation of outbreaks (WHO, 2000)

http://www.who.int/csr/resources/publications/surveillance/WHO_CDS_CSR_EDC_2000_4/en/

Leishmaniasis

<http://www.who.int/leishmaniasis/en/>

Leptospirosis

http://www.who.int/water_sanitation_health/diseases/leptospirosis/en/

Malnutrition

Nutrition in emergencies publications

http://www.who.int/nutrition/publications/nut_emergencies/en/

Communicable diseases and severe food shortage situations (WHO, 2005) [pdf-250kb]

http://www.who.int/diseasecontrol_emergencies/guidelines/Severe_food_shortages.pdf

The management of nutrition in major emergencies. (WHO, 2000) [pdf-12 800kb]

<http://whqlibdoc.who.int/publications/2000/9241545208.pdf>

Infant feeding in emergencies - guidance for relief workers in Myanmar and China

http://www.who.int/child_adolescent_health/news/2008/13_05/en/index.html

Guidelines for the inpatient treatment of severely malnourished children (WHO, 2003) [pdf-400kb]

<http://www.who.int/nutrition/publications/severemalnutrition/9241546093/en/index.html>

Community-based management of severe malnutrition

<http://www.who.int/nutrition/publications/severemalnutrition/978-92-806-4147-9/en/index.html>

Management of the child with a serious infection or severe malnutrition: guidelines at first referral level in developing countries (WHO, 2000)

http://www.who.int/child_adolescent_health/documents/fch_cah_00_1/en/index.html

Guiding principles for feeding infants and young children during emergencies (WHO, 2004) [pdf-1800kb]

http://www.who.int/nutrition/publications/guiding_principles_feedchildren_emergencies.pdf

Infant and young child feeding in emergencies. Operational guidance for emergency relief staff and programme managers (IFE, 2007) [pdf-870kb] (in English and Arabic)

<http://www.enonline.net/pool/files/ife/ops-guidance-2-1-english-010307.pdf>

<http://www.enonline.net/pool/files/ife/ops-g-arabic-v2-1.pdf>

Gaza Alert - Media Guide on Infant and Young Child Feeding in Emergencies (in English and Arabic)

[http://www.enonline.net/pool/files/ife/ife-media-flyer-final\(1\).pdf](http://www.enonline.net/pool/files/ife/ife-media-flyer-final(1).pdf)

<http://www.enonline.net/pool/files/ife/media-guide-on-ife-arabic.pdf>

Management of dead bodies

Management of dead bodies after disasters: a field manual for first responders (2006) [pdf-1100kb]

<http://www.paho.org/english/dd/ped/DeadBodiesFieldManual.pdf>

Management of dead bodies in disaster situations (WHO, 2004) [pdf-780kb]

<http://www.paho.org/english/DD/PED/DeadBodiesBook.pdf>

Measles

WHO/UNICEF Joint Statement on reducing measles mortality in emergencies (WHO/UNICEF, 2004)

http://whqlibdoc.who.int/hq/2004/WHO_V&B_04.03.pdf

WHO measles information

<http://www.who.int/immunization/topics/measles/en/index.html>

Measles fact sheet

<http://www.who.int/mediacentre/factsheets/fs286/en/>

Medical waste in emergencies

Medical wastes in emergencies

http://www.who.int/water_sanitation_health/medicalwaste/emergmedwaste/en/

Guidelines for Safe Disposal of Unwanted Pharmaceuticals in and after Emergencies (WHO, 1999)

<http://www.healthcarewaste.org/en/documents.html?id=15&suiwant=16>

Four steps for the sound management of health-care waste in emergencies (WHO, 2005)

<http://www.healthcarewaste.org/en/documents.html?id=184&suiwant=8>

Mental health in emergencies

Mental health in emergencies

http://www.who.int/mental_health/resources/emergencies/en/index.html

http://www.who.int/mental_health/resources/emergencies/en/index.html

IASC Guidelines on Mental Health and Psychosocial support in Emergency settings (2008)

English [pdf-800kb]

http://www.who.int/mental_health/emergencies/guidelines_iasc_mental_health_psychosocial_april_2008.pdf

Arabic [pdf-1.1 Mb]

http://www.who.int/mental_health/emergencies/iasc_guidelines_arabic.pdf

IASC Guidelines on Mental Health and Psychosocial support in Emergency settings: Checklist for field use (2008) [pdf-4 MB]

http://www.who.int/mental_health/emergencies/IASC_guidelines.pdf

Meningitis

Control of epidemic meningococcal disease. WHO practical guideline, 2nd edition (WHO, 1998)

<http://www.who.int/csr/resources/publications/meningitis/WHO EMC BAC 98 3 EN/en/>

Outbreak Communications

WHO Outbreak communication guidelines

http://www.who.int/csr/resources/publications/WHO_CDS_2005_28/en/index.html

Polio

WHO-recommended surveillance standard of poliomyelitis

http://www.who.int/immunization_monitoring/diseases/poliomyelitis_surveillance/en/index.html

Surgery - emergency surgical care

Integrated Management for Emergency and Essential Surgical Care (IMEESC) tool kit

<http://www.who.int/surgery/publications/imeesc/en/index.html>

Tetanus

Maternal and Neonatal Tetanus. M Roper et al. Lancet 2007; 370: 1947-59.

http://www.who.int/hpvcentre/Maternal_and_neonatal_tetanus_Seminar.pdf

Tetanus Immunization: Maternal and Neonatal Tetanus (MNT) elimination

http://www.who.int/immunization_monitoring/diseases/MNTE_initiative/en/index.html

Surgical Care at the District Hospital (2003)

<http://www.who.int/surgery/publications/en/SCDH.pdf>

Travel advice

Guide on Safe Food for Travellers

<http://www.who.int/foodsafety/publications/consumer/travellers/en/index.html>

International Travel and Health (2008)

<http://www.who.int/ith/en/>

Tuberculosis

Tuberculosis care and control in refugee and displaced populations. An interagency field manual (2007). [pdf-960kb]

http://whqlibdoc.who.int/publications/2007/9789241595421_eng.pdf

Vaccines and biologicals

<http://www.who.int/immunization/en/>

Vector control

Integrated vector management

<http://www.who.int/malaria/integratedvectormangement.html>

Pesticides and their application for the control of vectors and pests of public health importance (WHO,2006)

http://whqlibdoc.who.int/hq/2006/WHO_CDS_NTD_WHOPEP_GCDPP_2006.1_eng.pdf

Wounds, injuries and trauma care

Prevention and management of wound infection [pdf-40kb]

<http://www.who.int/hac/techguidance/tools/Prevention%20and%20management%20of%20wound%20infection.pdf>

Guidelines for essential trauma care (2004) [pdf-764kb]

<http://whqlibdoc.who.int/publications/2004/9241546409.pdf>

Prehospital trauma care systems (2005) [pdf-566kb]

http://www.who.int/violence_injury_prevention/publications/services/39162_oms_new.pdf

Integrated Management for Emergency and Essential and Surgical Care (IMEESC) tool kit

<http://www.who.int/surgery/publications/imeesc/en/index.html>

Best Practice Guidelines on Emergency Surgical Care in Disaster Situations [pdf-2254kb]

<http://www.who.int/surgery/publications/BestPracticeGuidelinesonESCinDisasters.pdf>

White Phosphorous: Systemic Agent

http://www.cdc.gov/NIOSH/ersbdb/EmergencyResponseCard_29750025.html

Surgical Care at the District Hospital (2003)

<http://www.who.int/surgery/publications/en/SCDH.pdf>

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WHO generic essential emergency equipment list [pdf-111kb]

<http://www.who.int/surgery/publications/EEEGenericListFormatted%2006.pdf>

Zoonotic diseases

<http://www.who.int/zoonoses/resources/en/>