

# Famine and Risk of Mortality in Gaza

Bashar Alzghoul, MD FCCP<sup>1</sup>

**KEYWORDS** - Gaza, Blockade, Humanitarian Crisis, Food insecurity, Famine, Malnutrition

This correspondence intends to highlight the critical situation confronting the Palestinian population residing in Gaza, particularly in the northern governorates, characterized by acute shortages of food and water.

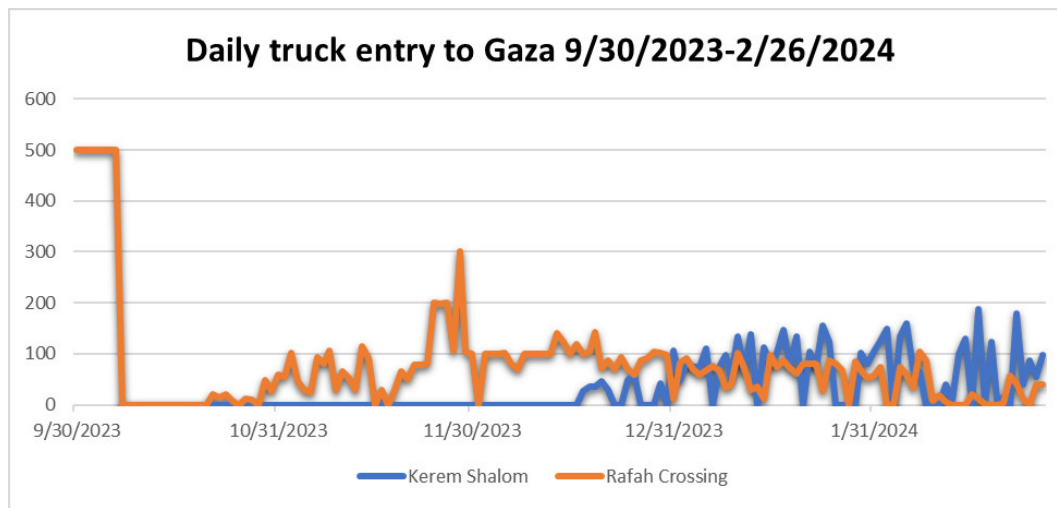
Since the initiation of the comprehensive siege on Gaza's populace on October 7th, 2023, a substantial portion of the community has been displaced from their residences [1]. This all-encompassing blockade has led to the halt of crucial services, including electricity, food, water, and fuel, worsening the already dire circumstances the population faces. To provide context, before October 7th, nearly 500 trucks would enter Gaza daily, delivering essential commodities such as food, water, animal fodder, medical supplies, and fuel for the 2.3 million inhabitants [2]. After October 7th, the number dropped by two-thirds, averaging 146 daily (Figure 1). On January 26th, 2024, the International Court of Justice (ICJ) ordered "immediate and effective measures" to protect Palestinians in the occupied Gaza Strip from the risk of genocide by ensuring sufficient humanitarian assistance and enabling essential services [3]. After that, the truck supply dropped another third, averaging 105 trucks per day [2]. This drop has compounded the suffering of Palestinians living in Gaza. The two routes through which supply trucks enter Gaza are the Rafah crossing between Egypt and the Gaza Strip and the Kerem Shalom crossing between Israel and the Gaza Strip. However, Israeli protesters have recently disrupted the supply through the Kerem Shalom crossing, stopping the trucks from entering and causing the crossing to be closed several times, including from Feb 8-10 and again from Feb 15-17 [4]. Similarly, the number of trucks entering through Rafah crossing has significantly dropped [4]. According to UNRWA's estimate, as of February 25th, 2024, only 12,706 trucks had entered Gaza since October 7th, averaging 88 trucks per day, less than one-fifth of the usual daily supply to Gaza before October 7th (figure 1). [5].

<sup>1</sup> Department of Medicine, Division of Pulmonary and Critical Care Medicine, University of Florida, Gainesville, FL 32610

Conflict of interest: No conflict of interest.

Email: bashar.alzghoul@medicine.ufl.edu

**Figure 1.** Trucks entry records to Gaza through Rafah crossing and Karem Shalom crossing from September 2023 until February 2024



To force the migration of people from North Gaza to South Gaza, Israel has nearly wholly blocked the food supply to North Gaza, where close to 500,000 people still reside [6, 7]. The United Nations rights expert Michael Fakhri reported that Israel is deliberately starving Palestinians [8]. On February 25th, 2024, Philippe Lazzarini from the UN said, “The last time UNRWA was able to deliver food aid to northern Gaza was on 23 January. Since then, together with other UN agencies, we have warned against looming famine. Appealed for regular humanitarian access. Famine can be averted if more food...” [9]. As of February 23, 2023, the United Nations Office for the Coordination of Humanitarian Affairs reported that close to 100% of people in Gaza (2.2 million) are facing a crisis of food insecurity, 50% (1.17 million) are facing emergency levels of food insecurity and 25% (0.5 million) facing catastrophe levels of food insecurity, also known as Integrated Food Security Phase Classification (IPC) number 5, famine [10]. Famine is the highest phase of the IPC Acute Food Insecurity scale and is defined as a state where extreme deprivation of food, starvation, death, destitution, and extremely critical levels of acute malnutrition are or will likely be evident [11]. The number of people in famine has increased rapidly by 50%, from 377 thousand to 567 thousand, between December 8th and February 6th, per the IPC. In the last decade, the world has witnessed two famines, in Somalia in 2011 and in South Sudan in 2017, that resulted in widespread acute malnutrition and the deaths of 350 thousand deaths of people combined [12] [13]. Similar to the famines in Somalia and South Sudan, Gaza is experiencing extreme food crises in which large populations

lack adequate access to food, driven by ongoing siege. This will ultimately result in thousands of acute mortalities.

During a famine, children and the elderly are the most vulnerable. Shockingly, one in six children under the age of 2 are already malnourished [14]. In the past few days, there has been a rise in infant deaths. [15] If this siege continues, the initial few deaths will be followed by an exponential increase in mortality over the next few weeks. [16] and the death toll can easily surpass military casualties [17]. In living beings, including humans, starvation-induced mortality increases exponentially and not linearly [13, 18].

According to the IPC classification, there are close to 600,000 people suffering from famine. If this situation continues, almost 1,200 people could die every day over the next few weeks. If the famine is not addressed, between 30,000 and 60,000 people could die in the next 30 days, which is more than the current 30,000 military casualties. This number could increase to 100,000 to 200,000 deaths in the next 60 days if no action is undertaken.

Another predictive model shows that in total starvation, mortality can reach 30% within 60 days, and in partial starvation, mortality can reach 30% in 100 days. [19]. In addition to the immediate risk of death, famine also has severe implications for long-term health, such as increasing the risk of cancer, growth retardation, cognitive dysfunction, diabetes, and immune deficiency [20-25].

## REFERENCES

- 1 BBC. Gaza Strip in maps: How life has changed in two months. 2023 12/21/2023; Available from: <https://www.bbc.com/news/world-middle-east-20415675>.
- 2 Amnesty International. Israel Defying ICJ Ruling to Prevent Genocide by Failing to Allow Adequate Humanitarian Aid to Reach Gaza 2024 02/26/2024 02/27/2024; Available from: <https://www.amnestyusa.org/press-releases/israel-defying-icj-ruling-to-prevent-genocide-by-failing-to-allow-adequate-humanitarian-aid-to-reach-gaza/#:~:text=Before%20October%207%2C%20on,fodder%2C%20medical%20supplies%20and%20fuel>.
- 3 INTERNATIONAL COURT OF JUSTICE. Summary of the Order of 26 January 2024. 2024 01/26/2024 02/27/2024; Available from: <https://www.icj-cij.org/node/203454>.
- 4 Kaufman, E., G. Davies, and C. Bentson. Decrease in aid trucks entering Gaza as access to food dwindles, agencies say. 2024 02/21/2024 02/27/2024; Available from: <https://abcnews.go.com/International/decrease-aid-trucks-entering-gaza-access-food-dwindles/story?id=107392870>.
- 5 UNRWA. Gaza Supplies and Dispatch Tracking-Dashboard. 2024 02/25/2024 02/27/2024; Available from: <https://app.powerbi.com/view?r=eyJrIjoiTUVkYmEwNmMtZWYxNy00ODhlLWl2ZjctNjlzZmZQ5OGQxNzY5IiwidCI6IjI2MmY2YTQxLTlwZktNDE0MC04ZDNiLWZkZjVIZWNiNDE1NyIsImMiOiI9&pageName=ReportSection-3306863add46319dc574>.
- 6 Aljazeera. Palestinians flee starvation in north Gaza. 2024 02/26/2024 02/27/2024; Available from: <https://www.aljazeera.com/program/newsfeed/2024/2/26/palestinians-flee-starvation-in-north-gaza>.
- 7 Integrated Food Security. IPC Global Initiative - Special Brief - Gaza Strip. 2024 01/2024 02/27/2024; Available from: [https://www.ipcinfo.org/fileadmin/user\\_upload/ipcinfo/docs/IPC\\_Gaza\\_Acute\\_Food\\_Insecurity\\_Dec2023Feb2024.pdf](https://www.ipcinfo.org/fileadmin/user_upload/ipcinfo/docs/IPC_Gaza_Acute_Food_Insecurity_Dec2023Feb2024.pdf).
- 8 Reed, B. Israel is deliberately starving Palestinians, UN rights expert says. 2024 02/27/2024; Available from: <https://www.theguardian.com/world/2024/feb/27/un-israel-food-starvation-palestinians-war-crime-genocide>.
- 9 Aljazeera. UN agency warns of 'looming famine' in Gaza amid Israel war. 2024 02/26/2024 02/27/2024; Available from: <https://www.aljazeera.com/news/2024/2/26/no-aid-delivery-in-northern-gaza-since-more-than-a-month-unrwa>.
- 10 United Nations Office for the Coordination of Humanitarian Affairs. Hostilities in the Gaza Strip and Israel - reported impact I Day 140. 2024 02/23/2024 02/27/2024; Available from: <https://www.ochaopt.org/content/hostilities-gaza-strip-and-israel-reported-impact-day-140>.
- 11 Integrated Food Security. FACT SHEET THE IPC FAMINE. 2024 02/27/2024; Available from: [https://www.ipcinfo.org/fileadmin/user\\_upload/ipcinfo/docs/IPC\\_Famine\\_Fact-sheet\\_2022.pdf](https://www.ipcinfo.org/fileadmin/user_upload/ipcinfo/docs/IPC_Famine_Fact-sheet_2022.pdf).
- 12 Integrated Food Security Phase. WHAT IS FAMINE? 02/27/2024; Available from: <https://www.ipcinfo.org/famine-facts/en/>.
- 13 World Peace Foundation. FAMINE TRENDS DATASET, TABLES AND GRAPHS. 02/27/2024; Available from: <https://sites.tufts.edu/wpf/famine/>.
- 14 WHO. Children's lives threatened by rising malnutrition in the Gaza Strip. 2024 02/19/2024 02/27/2024; Available from: <https://www.who.int/news/item/19-02-2024-childrens-lives-threatened-by-rising-malnutrition-in-the-gaza-strip>.
- 15 Aljazeera. Two-month-old Palestinian boy dies of hunger amid Israel's war on Gaza. 2024 02/25/2024; Available from: <https://www.aljazeera.com/news/2024/2/25/two-month-old-palestinian-boy-dies-of-hunger-amid-israels-war-on-gaza>.
- 16 Aljazeera. Israel's war on Gaza live: Thousands could die in days as Israel blocks aid. 2024 02/27/2024 02/27/2024; Available from: <https://www.aljazeera.com/news/live-blog/2024/2/28/israels-war-on-gaza-live-thousands-could-die-in-days-as-israel-blocks-aid>.
- 17 Mercy Corps. Gaza Deaths from Hunger Could Surpass Casualties of Airstrikes in Coming Weeks. 2023 12/21/2023 02/27/2024; Available from: <https://www.mercycorps.org/press-room/releases/gaza-deaths-from-hunger>.
- 18 Biro, P.A. and D.J. Booth, Extreme boldness precedes starvation mortality in six-lined trumpeter (*Pelates sexlineatus*). *Hydrobiologia*, 2009. 635(1): p. 395-398.
- 19 Doberentz, E. and B. Madea, Starvation, Dehydration, Malnutrition, and Neglect, in *Geriatric Forensic Medicine and Pathology*, R.W. Byard and K.A. Collins, Editors. 2020, Cambridge University Press: Cambridge. p. 109-129.
- 20 de Zwarte, I.J.J., P. Ekamper, and L.H. Lumey, Infant and child mortality in the Netherlands 1935-47 and changes related to the Dutch famine of 1944-45: A population-based analysis. *Popul Stud (Camb)*, 2023: p. 1-19.
- 21 Li, C. and L.H. Lumey, Exposure to the Chinese famine of 1959-61 in early life and long-term health conditions: a systematic review and meta-analysis. *Int J Epidemiol*, 2017. 46(4): p. 1157-1170.
- 22 Lumey, L.H., et al., Long-term impact of pre-natal exposure to the Ukraine famine of 1932-1933 on adult type 2 diabetes mellitus. *medRxiv*, 2023.
- 23 Wang, J., et al., Exposure to the Chinese Famine in Childhood Increases Type 2 Diabetes Risk in Adults. *J Nutr*, 2016. 146(11): p. 2289-2295.
- 24 Wieggersma, A.M., et al., Exposure to the Dutch Famine in Early Gestation and Cognitive Function and Decline in Older Age. *Nutrients*, 2023. 15(2).
- 25 Yao, W.Y., et al., Exposure to Chinese famine in early life and height across 2 generations: a longitudinal study based on the China Health and Nutrition Survey. *Am J Clin Nutr*, 2024. 119(2): p. 433-443.