

Appendix to letter of October 2, 2024 re: American physicians observations from the Gaza Strip since October 7, 2023

Today, the Gaza Strip is once again the most dangerous place in the world to be a child.
UNICEF Executive Director [Catherine Russell](#), December 1, 2023

Gaza is the most dangerous place in the world to be an aid worker, as well as the most dangerous place to be a civilian.

[International Rescue Committee](#), April 3, 2024

Tiny Gaza Is Home to Most of the World's Hungriest People.
Wall Street Journal [headline](#), January 22, 2024

[A]t least 116 journalists and media workers were among the more than 42,000 killed since the war began, making it the deadliest period for journalists since CPJ began gathering data in 1992.

[Committee to Protect Journalists](#), September 30, 2024

This appendix complements the letter sent to President Joseph R. Biden, Vice President Kamala D. Harris, and others on October 2, 2024 by 99 American healthcare workers who have served in the Gaza Strip since October 7, 2023. It is divided into four sections. The first explores the evidence bearing on the death toll from the conflict between Israel and the Palestinians in Gaza since October 7, 2023. The second focuses on the evidence of violence deliberately directed at children and the right to learn. The third focuses on the evidence of a direct and sustained Israeli attack on the healthcare system and healthcare workers in Gaza. And the last focuses on the evidence of a direct and sustained attack on civilian infrastructure in Gaza and widespread environmental devastation.

All sections are cited with links instead of footnotes for ease of reading. Please contact Dr. Feroze Sidhwa (DoctorsInGaza@gmail.com) for with any questions or clarifications. This appendix can be accessed electronically at GazaHealthcareLetters.org.

The likely death toll since October 7, 2023

“[Conflict](#) obviously causes deaths and injuries on the battlefield, but also health consequences from the displacement of populations, the breakdown of health and social services, and the heightened risk of disease transmission.” Deaths from military violence are usually the smaller share, and indeed [civilian excess mortality](#) in wars can be 25 times higher than deaths from violence. These so-called “indirect” deaths are driven by respiratory infections, gastrointestinal infections, and maternal and neonatal deaths. The more severe and prolonged the societal disruption the higher these deaths rise. Children under five years of age and adults over 69 years of age experience the greatest increase in mortality, and these effects often persist for two years after the fighting ends.

***The Lancet*, the most prestigious medical and public health journal in the world, recently published [estimates](#) from American, British, and Canadian experts on the likely toll this conflict has taken: “it is not implausible to estimate that up to 186,000 or even more deaths could be attributable to the current conflict in Gaza.”** Below we summarize the available public information on deaths from military violence, malnutrition, infectious diseases, chronic diseases, and cancers. As noted above, there is probative evidence that the death toll in Gaza is many times higher than the publicly reported figure of violent deaths. We include the publicly available information from the October 7 attack by Palestinian armed groups on Israel both for completeness and comparison.

Deaths from violence

On October 7, 2023 Palestinian armed groups and individuals carried out a [major attack](#) on southern Israel, killing at least 1,123 Israelis. Of these, 809 were civilians (72%), including at least 40 minors, as well as 314 Israeli military and security personnel (28%). Since then, as of September 19, 2024 an additional 346 Israeli military personnel have been [reported](#) killed in Gaza, bringing the total to at least 1,469 Israelis killed, 45% military and security personnel and 55% civilians.

As of September 25, 2024, since October 7 [Israel has killed](#) at least 41,495 Palestinians through military violence in Gaza. As of August 31, 2024, 34,344 of those killed have been fully identified by the Gaza Health Ministry: 33% of fully identified casualties are children, 18% are women, and 7% are elderly people. By May 2 an additional 10,000 bodies were [estimated](#) to be buried under the rubble of destroyed buildings. The Gaza Health Ministry’s numbers, cited above, are widely considered *a reliable minimum*. For example:

- On November 8 Assistant Secretary of State for Near Eastern Affairs Barbara Leaf [stated](#) at a hearing before the House Foreign Affairs Committee that the true numbers of dead are “very high, frankly, and it could be that they’re even higher than are being cited.”
- On February 29, Secretary of Defense Lloyd Austin [cited](#) these numbers without qualification in testimony before the House Armed Services Committee.
- The State Department [cited](#) Gaza Ministry of Health data without qualification prior to the October 7 attacks.
- Israeli intelligence [reportedly](#) uses these numbers in internal decision-making and analysis.
- Both the [Washington Post](#) and the Israeli newspaper [Haaretz](#) report that these numbers are generally reliable.
- Public health experts at the [Columbia Mailman School of Public Health](#), the [Johns Hopkins Bloomberg School of Public Health](#), and the [London School of Hygiene and Tropical Medicine](#) all report that the Gaza Ministry of Health is a reliable source establishing a minimum number of dead from violence.

In the 100 days from October 7, 2023 to January 14, 2024 Israeli forces killed more than 1% of Gaza’s population according to the Ministry of Health data. A UN ESCWA report [noted](#) that “No other armed conflict in the twenty-first century” has had “such a devastating impact on a population in such a short timeframe. To find a 100-day period

with greater bloodshed, it is necessary to go back to the 1994 genocide against the Tutsi in Rwanda.”

Deaths from malnutrition

The Gaza Health Ministry only reports deaths caused directly by violence that arrive at a hospital morgue. As noted above, these are typically the smallest number of deaths in a large-scale protracted conflict.

Hunger in Gaza is not being caused by the unavoidable societal disruption that accompanies war. Israel is deliberately starving the Palestinians of Gaza:

- According to [Human Rights Watch](#) the “Israeli government is using starvation of civilians as a method of warfare in the occupied Gaza Strip.... [H]igh-ranking Israeli officials, including Defense Minister Yoav Gallant, National Security Minister Itamar Ben-Gvir, and Energy Minister Israel Katz have made public statements expressing their aim to deprive civilians in Gaza of food, water and fuel – statements reflecting a policy being carried out by Israeli forces.”
- On February 12 Senator Van Hollen [declared](#) on the Senate floor that “Kids in Gaza are now dying from the deliberate withholding of food.”
- On April 5, former Special Envoy for Middle East Humanitarian Issues Ambassador David Satterfield [reportedly](#) told the American Jewish Committee “there is an imminent risk of famine for the majority, if not all, the 2.2 million population of Gaza. This is not a point in debate. It is an established fact, which the United States, its experts, the international community, its experts assess and believe is real.”
- On April 10, USAID Administrator Samantha Power [reported](#) to the House Foreign Affairs Committee that “USAID teams have been working day and night to address the catastrophic humanitarian crisis in Gaza, where nearly the entire population is living under the threat of famine.” She [answered](#) “yes” when asked if northern Gaza was already in famine.
- On May 5, World Food Programme Executive Director Cindy McCain [stated](#) in a televised interview that “there is famine, full blown famine in the north, and its moving its way south” in Gaza.
- Both the U.S.-funded [Integrated Food Security Phase Classification](#) (IPC) and the U.S. [Famine Early Warning System](#) (FEWS) warned in March that Gaza was likely in famine.
- On May 28, Stacy Gilbert, a 20-year career State Department senior advisor in the Bureau of Population, Refugees, and Migration, [resigned](#) after the input of her team to NSM-20 was overruled. “I was shocked,” she said of the report, “that it...went on to say: it is our assessment that Israel is not blocking humanitarian assistance. That is not – that is *not* – the view of subject matter experts at the State Department, at USAID, nor among the humanitarian community. And that was known, that was absolutely known to the administration for a very long time... The reason we’ve come to this point is because of Israel’s obstruction.”
- On May 31 the FEWS [reported](#) that food delivery in May 2024 was cut in half compared to April. Because “significant amounts of food remain in storage or staging areas within Gaza” which are controlled by the IDF the “amount of food entering Gaza does not equate to the amount on markets or being consumed.” In June, data [limitations](#) prevented the FEWS from distinguishing between IPC Phase 4 and Phase 5 (Famine) conditions in northern Gaza. In

southern Gaza Phase 4 conditions were well established. “In a scenario in which large-scale assistance is delivered, Emergency (IPC Phase 4) outcomes are likely. In a scenario in which large-scale assistance is disrupted for multiple weeks or more, Famine (IPC Phase 5) is likely. Regular, safe, and unhindered humanitarian access to deliver lifesaving interventions must be guaranteed to confidently conclude that Famine (IPC Phase 5) will be averted.”

- On June 25 the IPC [warned](#) that even if the technical definition of famine is not met or cannot be proven due to incomplete data “the situation in Gaza is catastrophic and there is a high and sustained risk of Famine across the whole Gaza Strip.” They [continued](#): “About 96 percent of the population in the Gaza Strip (2.15M people) face high levels of acute food insecurity through September 2024. While the whole territory is classified in Emergency (IPC Phase 4), over 495,000 people (22 percent of the population) are still facing catastrophic levels of acute food insecurity (IPC Phase 5). In this phase, households experience an extreme lack of food, starvation, and exhaustion of coping capacities. Another 745,000 people (33 percent) are classified in Emergency (IPC Phase 4).... The latest data show that, to be able to buy food, more than half of the households had to exchange their clothes for money and one third resorted to picking up trash to sell. More than half also reported that, often, they do not have any food to eat in the house, and over 20 percent go entire days and nights without eating. The humanitarian space in the Gaza Strip continues to shrink and the ability to safely deliver assistance to populations is dwindling. The recent trajectory is negative and highly unstable. Should this continue, the improvements seen in April could be rapidly reversed.” Compared to pre-October 7, the price of wheat flour has increased 979%, sugar 668%, salt 1233%, tomatoes 697%, potatoes 496%, onions 600%, and chicken eggs 587%.” In June the percentage of households receiving any kind of food parcel decreased by nearly half. “According to the Nutrition Vulnerability Analysis, over 90 percent of children aged 6-23 months and pregnant and breastfeeding women are eating two or fewer food groups each day, often those of the lowest nutritional value. Almost 90 percent of children under five have had at least one infectious disease, with 52 percent having had diarrhoea in the preceding two weeks. Water and sanitation access was also dire, with the NVA highlighting that around 80 percent of households listed “water” as a priority need. This situation is particularly worrying for formula-fed babies, and constitutes a proven risk for a rise in infectious diseases, including diarrheal illness and hepatitis A. With minor gains in humanitarian access, a modest improvement was reflected in food security indicators in April. However, such improvement is dependent on regular and continuous access to and availability of food and health services. In April, access and scale up of basic services certainly allowed for a stabilization of the nutrition situation in the South. However, the displacement of more than 1 million people in the south, and ground military operations in the north, reduced the minor gains achieved in April through the closure, disruption of services and displacement of nutrition sites located in shelters, health services, and hospitals.”
- On August 26 the World Food Programme reported that because of “intensifying conflict” the “WFP has had to reduce the contents of food parcels in Gaza as inflows of aid dipped and supplies dwindled. With two, or occasionally three, border crossings open, roughly half of the required food assistance entered Gaza in July. August is set to end with a similar result.... In two months, when rain and flooding is expected, most roads will become unusable.... In the last two months, WFP has managed to bring in only half of the 24,000 MT of food aid required for operations serving 1.1 million people.”

- On August 28 the World Food Programme temporarily suspended any staff movement in Gaza after a “clearly marked” WFP vehicle which was targeted by the IDF despite “receiving multiple clearances by Israeli authorities to approach...”
- The USAID Famine Early Warning System August 2024 Gaza Strip Targeted Analysis states that while Famine is currently averted in Gaza, “hunger and malnourishment remain dire, and hunger-related mortality is likely still occurring. Assistance is only partially mitigating the severity of acute food insecurity, resulting in Emergency! (IPC Phase 4!) outcomes across both the north and the south. Pockets of the population still face Catastrophe (IPC Phase 5). Emergency! (IPC Phase 4!) outcomes, with pockets of households in Catastrophe (IPC Phase 5), are expected to persist across Gaza from September to December. Palestinians will continue to endure large to extreme food consumption deficits, malnourishment, and hunger related mortality until government decision-makers take urgent and more meaningful action to ensure safe, consistent humanitarian access that facilitates both an increase in the quantity of aid and effective targeting and distribution of aid to 1.5-2.0 million people in need.... Nutrition services must also continue to be substantially scaled up to not only mitigate the risk of death from severe malnourishment, but reduce and prevent acute malnutrition, especially among children...”

The fact that Palestinians in Gaza are so hungry that many have died, or that this is the result of deliberate Israeli policy, is not in dispute. However, the scale of this starvation is not widely appreciated.

The IPC released reports on Gaza in [January](#), [March](#), and [July](#) 2024. Death from starvation of course takes time, and it is not clear how many people in Gaza have died from starvation and its complications or how many will die in the future. Still, according to the [IPC technical manual](#): in the catastrophe phase of food insecurity the crude death rate rises to *at least* 2 deaths per 10,000 people per day, and in the emergency phase the crude death rate rises to 1-2 deaths per 10,000 people per day. The IPC data is summarized in the table below:

| Date | #people in IPC phase 4 or 5 | Days covered by analysis | Expected dead |
|----------------------|-----------------------------|--------------------------|----------------------|
| Nov 24-Dec 7 | Catastrophe: 377,000 | 13 | 980 |
| | Emergency: 939,000 | 13 | 1221 |
| Dec 8-Feb 14 | Catastrophe: 576,000 | 68 | 7,834 |
| | Emergency: 1,170,000 | 68 | 7,956 |
| Feb 15-March 15 | Catastrophe: 677,000 | 28 | 3,791 |
| | Emergency: 876,000 | 28 | 2,453 |
| March 16-July 15 | Catastrophe: 1,107,000 | 45 | 9,963 |
| | Emergency: 854,000 | 45 | 3,843 |
| May 1-June 15 | Catastrophe: 343,000 | 45 | 3,087 |
| | Emergency: 643,000 | 45 | 2,894 |
| June 16-September 30 | Catastrophe: 495,000 | 106 | 10,494 |
| | Emergency: 745,000 | 106 | 7,897 |
| | | | Total: 62,413 |

In total it is likely that 62,413 people have died of starvation and its complications in Gaza from October 7, 2023 to September 30, 2024. Most of these will have been young children.

As long as aid agencies and public health experts are denied entry to Gaza the true numbers cannot be known. However, if these estimates are accurate they will approximately match the projected [estimates](#) of 85,750 total (direct and indirect) excess deaths in Gaza by August 2024 under the epidemics and military escalation scenarios published by a joint project from Johns Hopkins Center for Humanitarian Health and the London School of Hygiene and Tropical Medicine. This is the population-adjusted equivalent of 13.3 million deaths and 26.6 million injuries in the United States.

In its [June report](#), the IPC noted that Israel's invasion of Rafah led to a major disruption of feeding programs that had helped stave off famine in April and May, and notes that "the number of Outpatient Therapeutic Feeding Program (OTPs) shrunk between April (102) and May (66), and many nutrition partners lost access to warehouses and supplies..." They also note that "Due to the lack of humanitarian access and insecurity, no population surveys have been conducted to measure the prevalence of malnutrition", truly shocking given the dire situation. Despite the major data limitations, the IPC [estimates](#) that 495,000 (22.5%) Palestinians in Gaza remain in catastrophic food insecurity and another 745,000 (33.9%) in emergency food insecurity.

In its May 31 update to its reports on Gaza, FEWS [reported](#) that the death rate of 4/10,000/day in children under 5 had likely been surpassed in northern Gaza in April, and stated that "it is reasonable to infer from the inadequacy of health and nutrition interventions – including the complete absence of such services from Gaza governorate through April – that additional deaths [from malnutrition] have been unreported." On July 9, eleven international experts [declared](#) that famine had likely spread from northern to central Gaza.

And in its August update, FEWS noted that **"While the volume of humanitarian food assistance delivery to Gaza is significant on average over time, August was nevertheless the fourth consecutive month in which substantial reductions in caloric availability from food aid occurred across Gaza"** and noted that this is a "sharp decline of 40-45 percent compared to... humanitarian food assistance estimated in July, and a staggering 90-95 percent decline since April, the peak of food assistance delivery by truck in southern Gaza since October 2023." They continued: **"In August, humanitarian access significantly deteriorated, especially in Khan Younis and Deir al-Balah.** According to OCHA, the number of humanitarian missions denied access by COGAT has nearly doubled in the south (from 53 in July to 99 in August) and more than doubled in the north (from 30 in July to 68 in August) on a monthly basis. Amid the 14 evacuation orders in August, extremely damaged or impassable roads, and inconsistent fuel supply, humanitarians faced severely impeded access to Kerem Shalom crossing to receive new supplies of food. According to COGAT, humanitarian food trucks were inspected and approved for entry in the 21 days between August 7 and 28; however, UNRWA only recorded receiving humanitarian trucks carrying food on three separate days during that period. Furthermore, in late August, a WFP convoy returning from the KS/KAS border crossing carrying humanitarian cargo came under fire at an IDF checkpoint, resulting in a temporary suspension of all WFP operations and movement in Gaza." (all emphasis in original)

Alex de Waal, a leading historian of famine and executive director of the World Peace Foundation at Tufts University, [compared](#) the situation to “the worst famine on the IPC record books” in 2011 in Somalia. “At its nadir, 490,000 people were in ‘catastrophe’ conditions with a larger number in ‘emergency’ conditions. An estimated 258,000 people perished over 18 months.” Somalia’s population is eight times the size of Gaza’s, yet as many Palestinians in Gaza are thought to be in the catastrophe phase of food insecurity today as Somalians were at the worst moment of the 2011 famine.

All told, it is highly likely that the death toll from starvation-related causes exceeds the death toll from violence in Gaza. We hope and pray that starvation is not causing widespread death in Gaza, but this is wishful and dangerous thinking. Only time and careful investigation will reveal the truth. As physicians we fully agree with [de Waal](#): “Famine is unfolding in Gaza today. We should not have to wait until we count the graves of children to speak its name.”

Deaths from infectious diseases

Malnutrition and disease conspire together to kill children, especially those under the age of 5. Beyond the huge death toll from violence and famine, the destruction wrought on Gaza’s water, sanitation, and hygiene (WASH) infrastructure and the incredible overcrowding caused by the forced displacement of the overwhelming majority of the population, combined with widespread malnutrition, is extremely dangerous. UNOSAT satellite imagery analysis [found](#) that 87% of critical water and sanitation facilities in the Gaza Governorate had been destroyed or severely damaged by January 25. Oxfam’s Middle East director Sally Abi Khalil [noted](#) on May 13, that with “the infrastructure already beyond [the] breaking point, little or no healthcare available, and widespread malnutrition this could quickly escalate into a major epidemic.” Research in the *International Journal of Public Health* [reported](#) that Gaza has endured an 80% decrease in access to water since October 7. “In consequence, there is far too little water for drinking and washing—in some areas only 10% of the 15 Litres per person per day required in emergencies.”

In a report entitled [Water War Crimes](#), Oxfam concludes that “Israel has systematically weaponized water against the Palestinians in its latest assault on Gaza...” Indeed, “the Government of Israel has used water deprivation to dehumanize and ultimately threaten Palestinian lives since the 1993 Oslo Accords. This culminates, in a brutal fashion, in the current military operation in Gaza.” Gaza is likely the thirstiest place in the world: “Since the Israeli offensive began...people in Gaza have had only 4.74 litres of water per person per day for all uses...a dramatic 94% reduction in the amount of water available before. This is significantly below the internationally accepted minimum standard of 15 litres of water per person per day for basic survival in emergencies.” Five WASH “infrastructures had been taken out of service every three days” by Israeli attacks, amounting to a 1% loss of WASH capacity for Gaza every three days since October 7. By June 26 Gaza City had lost “nearly all of its water production capacity”, the “Israeli military had destroyed 100% of all water and sanitation warehouses in Gaza City and Khan Younis” and “70% of all sewage pumps and...100% of all wastewater treatment plants in Gaza” had been destroyed. If Israel’s plan to force one million or more Palestinians into the “Mawasi safe zone” the area “could become the most densely populated in the world with the potential to provide a mere 2.48 litres [of water] per person per day.”

The World Health Organization (WHO) [reported](#) on January 22 that the “burden of acute respiratory infections, diarrhea and skin infections has been particularly high, with a steady week-on-week high incidence of reported cases...” In other words, every week had higher numbers than the previous week. “The number of diarrheal illnesses reported among children under 5 years in the last three months of 2023 was about 25 times higher compared with the corresponding period in 2022.” Compounding the situation, “no meaningful public health measures for disease prevention and control could be implemented due to access constraints and lack of supplies coming into the Gaza Strip. The absence of such measures will result in unmitigated transmission of bacterial, viral, fungal and parasitic pathogens.... Surgical cases are managed suboptimally, resulting in higher levels of disability and death, including the need to prioritize life-saving amputations rather than limb reconstruction, premature discharge from hospital due [to] lack of bed availability and a high proportion of wound infections compounded with limited access to antibiotics.” As of June 30, the WHO [reported](#) 974,253 cases of acute respiratory infections, 562,753 cases of acute watery diarrhea 122,338 of which were in children under five years of age (there are an estimated 330,000 children in Gaza under that age), and 104,766 cases of acute jaundice in Gaza since October 7. As of July 7 12,000 cases of bloody diarrhea had been [reported](#). These numbers represent only confirmed cases and are surely a dramatic undercount.

When researchers at the Johns Hopkins Center for Humanitarian Health and the London School of Hygiene and Tropical Medicine [included](#) the outbreak of epidemics and military escalation (as is ongoing in Gaza) in their models they predicted 85,750 excess deaths in Gaza by August 2024. If this scenario is realized it will mean that Israel will have killed 3.9% of Gaza’s population, and perhaps wounded another 8%. We are unaware of a similar proportion of any population being killed and maimed in 10 months of conflict since World War II.

“On May 6th,” the IPC [notes](#) in its June report, “the IDF instructed residents of southern Rafah to leave their homes and announced the expansion of the Israeli-designated ‘humanitarian zone’”. Examination of the dimensions of the expanded zone revealed it to be approximately 62 km² in area...it is estimated that the population density within the zone could exceed 28,000 person/km². This would constitute the most densely populated area on earth...it would not be possible to provide adequate food and other essential supplies to the population within this zone...” Furthermore, “Given the projected concentration of people in the ‘humanitarian zone’, a failure to provide adequate humanitarian access or basic services could lead to a rapid deterioration and a catastrophe of unprecedented magnitude compared to the suffering already witnessed in Gaza since October.” Unsurprisingly, a “serious level of civil unrest in such a context is extremely likely. The ability to support displaced and resident people within the zone has already been degraded by high levels of destruction of WASH facilities, housing, and health facilities.” Oxfam [estimates](#) that in the Israeli-declared “humanitarian zone” of Mawasi there is one toilet for every 4,132 people (the [Sphere Handbook](#), which sets standards of quality for humanitarian emergencies, recommends 20-50 people per toilet at maximum).

Israel is concentrating a sick and malnourished population, constituted mainly of children, onto little more than a beach with no running water or even toilets available to it. In these conditions epidemics are virtually guaranteed and will be absolutely devastating, resulting

in tens of thousands more dead, most of them young children. There is absolutely no reason for the world to let this happen.

Disruption of care for chronic diseases and cancers

Cancer care has been entirely unavailable in Gaza since October 7. The previous mechanisms for referring patients outside of Gaza have broken down. Between October 7 and May 7 nearly five thousand Palestinians were evacuated from Gaza through the Rafah Crossing. Most of these evacuations were for traumatic injuries requiring complex reconstructive operations. Since Israel's capture and closure of the Rafah Crossing on May 7 [only 19 patients](#) in need of advanced medical care have been evacuated. On July 24 Israel did [reportedly](#) agree to evacuate 250 Palestinians from Gaza to the UAE. As described in the attached physicians letter, the few functional emergency departments in Gaza are continuously overwhelmed by people seeking care for chronic diseases, ranging from type 1 diabetes to seizures to hypertension.

The WHO [reported](#) on January 22 that "About 350,000 people live with chronic diseases in the Gaza Strip. Shortages of essential medications and closures of health care facilities are increasingly impeding access for the 52,000 individuals with diabetes, 45,000 with asthma, 45,000 with cardiovascular disease and 225,000 with hypertension. Of the 178 haemodialysis machines, 63% are situated north of Wadi Gaza, severely limiting access to dialysis for the 1,100 patients who need this service to survive."

It is unknown how many patients with chronic medical conditions have died as a result of the massive disruption of Palestinian society and Israel's sustained direct attacks on Gaza's healthcare system. We dare not venture a guess, but we can say with absolute certainty that it is no small number.

It is impossible to accurately estimate how many Palestinians in Gaza have died since October 7. As the above evidence makes abundantly clear the number is far, far higher than the 41,495 who are confirmed killed by military violence as of September 25, 2024. **With the known violent deaths, the estimated ten thousand people buried under the rubble and certainly dead, a conservative estimate of 62,413 deaths from malnutrition and disease, and a conservative estimate of 5,000 deaths in patients with chronic diseases, we estimate that the current death toll is at least 118,908, approximately agreeing with the projected estimates cited above. This represents a shocking 5.4% of all people in the Gaza Strip. These are the most conservative estimates of the death toll that can be made with the given available data as of September 30, 2024. It is highly likely that the real number of deaths in Gaza from this conflict is far higher than this most conservative estimate. Without an immediate ceasefire the death toll will only continue to mount, especially among young children.**

Evidence of Direct Attacks on Children and the Right to Learn

[Forty](#) minors, [including](#) five children age five or younger, were killed by Palestinian armed groups and individuals in the October 7 attacks. We struggle to find words for such an atrocity as the deliberate killing of forty innocent minors.

As of August 31, 2024 11,355 *fully identified* children are [known](#) to have been killed by Israeli military violence in Gaza. Indeed, **710 fully identified newborns and 1,400 toddlers (children under 2 years of age) have been killed in Gaza since October 7. Far more newborns and toddlers have been killed in Gaza since October 7 than all Israeli civilian deaths in the [First Intifada](#), [Second Intifada](#), and the October 7 attacks combined.**

This shocks us to our core, and even so we must acknowledge that this is a dramatic undercount. The true number is certainly more than double. An unknown number of children are buried under the rubble of Gaza. As of February, Save the Children [reported](#) at least 17,000 Palestinian children had been separated from their families or orphaned, and the “number is likely much higher now, with our team in Gaza finding more unaccompanied children every day.” We met many of these children in the hospitals where we served. They were referred to in the medical record by an acronym that should not exist: “WCNSF”, or “wounded child, no surviving family”.

These numbers are so large that they require some reference to be meaningful. Many of us have worked in the horrors of the war in Ukraine, and we believe it provides a useful measure of scale. In the United Nations Secretary General’s 2023 report [Children and armed conflict](#) the war in Ukraine was the deadliest armed conflict in the world for children.

In all of 2022, in a country of 38 million people under relentless assault from a military superpower, 732 children were killed, a rate of 0.0053 children killed per 100,000 people per day. In Gaza, with an estimated 11,355 fully identified children killed in the eleven months, the rate is 1.5 children killed per 100,000 people per day. **In other words, the rate of killing of children in Gaza since October 7 is 293 times higher than in Ukraine in 2022. If we assume 33% of the unidentified fatalities are children, the differential is 353 times higher than in Ukraine. No other conflict in living memory has killed an absolute minimum of 1% of the children in any territory in eleven months through violence alone.** This is the population-adjusted equivalent of 743,700 children being killed in the United States, an atrocity that is simply unfathomable!

As detailed above, it is very likely that tens of thousands of Palestinians in Gaza have already died of starvation, and a [large proportion](#) of these deaths will have been in young children. There is an unusually large amount of recorded evidence of children being directly targeted by Israeli violence in Gaza (e.g. the [video recording](#) of 3-year-old Emad Abu al-Qura being shot while in the arms of his 20-year-old medical student cousin Hadeel, or the [killing](#) of 6-year-old Hind Rajab, 15-year-old Layan Hamada, and the medics sent to rescue Hind). As stated in the attached letter, every signatory who worked in emergency settings saw multiple children shot in the head and/or chest during their time in Gaza, usually on a daily basis. It “is notable”, concluded a [study](#) in *BMJ Global Health*, “that the proportion of women and children killed [in Gaza since October 7] would be indistinguishable if Israel were known to be indiscriminately bombing civilians.”

Beyond the killing of children lies the utter devastation of Gaza’s educational and learning systems. By January 20 Israel had [destroyed](#) every single university in Gaza, often [enthusiastically and publicly](#). Israel’s assault on institutions of learning is so widespread that it

was [termed](#) a “scholasticide” by 25 international experts and an “[educide](#)” by Israeli academic Neve Gordon. The Mezan Center for Human Rights [reports](#) that more than 500 schoolteachers and university professors have been killed in Gaza since October 7. 76 out of 288 (26%) UNRWA schools have been directly attacked by the Israeli military, 285 out of 448 (64%) public schools have been destroyed, and 80% of the buildings in Palestinian universities have been destroyed, effectively destroying every university in Gaza. No child in Gaza has attended school in nearly one year. Students with international scholarships have not been permitted to leave Gaza to study abroad.

Evidence of Direct Attacks on Healthcare Personnel and Facilities

Virtually all of Gaza’s acute care hospitals have been attacked and damaged. As of [September 25](#), 19 of Gaza’s 36 hospitals are completely out of service, while 17 remain partially functional. Nine field hospitals are functional, four partially and five fully. As of March 22, 81% of Gaza Health Ministry and UNRWA [primary care clinics](#) had ceased functioning. By January 22, 59% of the [hospital beds](#) in Gaza had been destroyed, while the remaining partially functioning hospitals operated at 35% of their actual bed capacity. 57 out of 132 (43%) primary health clinics are functional, while the rest are nonfunctional. As of April 1, nineteen [international emergency medical teams](#) with 120 international and 500 national staff, had performed 225,000 patient consultations, performed over 13,000 emergency operations, and assisted over 900 deliveries, providing desperately needed relief to our Palestinian healthcare colleagues and much needed medical and surgical care to Palestinians in Gaza. There is [significant probative evidence](#) from a statistical study by a team of American and German researchers that Israel made no distinction between hospitals and other targets in Gaza during the first month of the attack.

As discussed in the attached letter, our Palestinian healthcare colleagues are beleaguered, besieged, and demoralized. Investigative reporting has [confirmed](#) that mistreatment and truly sadistic torture – including shocking sexual violence – is in fact being widely used in Israeli detention centers against Palestinian detainees from Gaza, including healthcare personnel. Ambulance personnel [were particularly cynical](#) about their [chances of surviving the war](#), based largely on prior experience during Israeli invasions of Gaza.

According to the World Health Organization, from October 7 to September 25, Israel [carried out](#) 516 attacks on medical facilities and healthcare workers, killing 765 people and detaining dozens of health workers. Three physicians are known to have [died](#) in Israeli custody. According to a report released on September 17 by the Gaza Ministry of Health 986 fully identified healthcare workers have been killed in Gaza since October 7, including 260 nurses and 146 physicians. This represents a staggering 1 out of every 20 healthcare workers in Gaza. Indeed, when only 500 healthcare workers’ deaths were known, Medical Aid for Palestinians [reported](#) “More healthcare workers have been killed in Gaza since October than were reported killed in all conflicts globally in 2021 and 2022 combined.”

Of the 160 Palestine Red Crescent Society [ambulances](#) in the Gaza Strip, 27 have been destroyed, while 19 PRCS staff and volunteers have been killed while on duty and another 15 killed off duty, 34 seriously injured, and three are currently in Israeli detention. Gaza Ministry of

Health ambulances have [fared](#) even worse than those of the PRCS, with 126 damaged or destroyed by April 3.

Save the Children [reports](#) that the “rate of attacks per month on healthcare in Gaza since the beginning of the war has been higher than in any other recent conflict globally, standing at an average of 73 attacks each month,” and compares this to the next worst case: 67 attacks per month in Ukraine, a difference of 8%. These unadjusted numbers fail to capture the incredible scale of direct Israeli attacks on healthcare personnel and infrastructure in Gaza.

The rate of attacks on healthcare per day per 1,000,000 people is 0.66 in Gaza and 0.059 in Ukraine. Thus, the rate of attacks on healthcare facilities and personnel in Gaza is 12 times higher than in the next worst conflict of the world. Furthermore, a Ukrainian who flees the battlegrounds of the war will find a functional healthcare system and relative safety elsewhere in Ukraine (many of us have worked in Ukraine, thus we must stress: [relative](#) safety), while “[there is no safe place in Gaza](#)”. There were 3,412 acute care [hospital beds](#) in Gaza at the beginning of the war. This is 1.5 beds per 1,000 people, compared to 7.3 beds per 1,000 people in [Ukraine](#). After the widespread destruction of hospitals there are now approximately 1,400 acute care [hospital beds](#) in Gaza, 0.6 beds per 1,000 people ([fewer](#) than in Yemen or Sudan), more than 96,000 of whom have been [injured](#) by military weaponry in the past twelve months. Treating just these injured patients would fully utilize all of Gaza’s current healthcare resources for decades.

Medical ethicist Dr. Arianne Shahvisi [asked](#) in the *BMJ Journal of Medical Ethics*: “What happens when the walls of the hospital are blown away? When neonatal incubators lose power, and premature babies must be kept warm on sheets of aluminum foil? What should medical ethicists do when extreme scarcity [of healthcare resources] arises because the entire health infrastructure of a place is being deliberately destroyed?”

Evidence of Widespread Environmental and Infrastructural Devastation

In January, UN Under-Secretary General for Humanitarian Affairs Martin Griffiths [stated](#) that “Gaza has simply become uninhabitable.” The present and future harm to Palestinians in Gaza from the widespread environmental contamination caused by the unprecedented destruction of buildings and infrastructure in Gaza is incalculable.

Those of us who were able to move around the Gaza Strip universally agreed that the level of devastation is simply beyond description. This massive destruction would have been impossible without the repeated provision of purely offensive American weaponry to Israel, particularly the [emergency provision](#) of thousands of MK84 and MK82 munitions that were dropped on civilian homes and civilian infrastructure from US-supplied aircraft utilizing US-supplied jet fuel. According to the [United Nations Environment Programme](#) this destruction has already created an estimated 39 million tons of debris contaminated with unexploded ordinance, environmental pollutants, and human remains. **The same report notes that the extent of destruction is so vast that it is “unprecedented... For each square metre in the Gaza Strip, there is now over 107 kg of debris...”** According to the United Nations Special Rapporteur on adequate housing, [Balakrishnan Rajagopal](#): “All that makes housing ‘adequate’ – access to services, jobs, culture, schools, religious places, universities, hospitals – have all been levelled.” He went

on to say that “the scale and intensity of destruction in Gaza is ‘far worse’ than in Aleppo, Mariupol or even Dresden and Rotterdam during the Second World War.”

After reviewing the available information a group of 40 international public health scientists concluded that “we must call attention to the devastating consequences for public health and the lives of future generations resulting from Israeli military action and its impact on the Gazan environment.” They noted extensive damage or destruction to half of Gaza’s buildings, 60% of its housing stock, the razing of 45% of Gaza’s farmland, destruction of 70% of Gaza’s fishing boats, the killing or premature slaughter of 60-70% of Gaza’s meat and dairy livestock, and “an untold amount of damage to animal habitats and ecosystems.” Today “much solar equipment lies in ruin amidst the thousands of buildings destroyed, alongside pulverized building materials containing hazardous materials such as asbestos and other debris.” And, as UNEP noted, an enormous amount of unexploded ordinance and human remains.

As of April 2, the World Bank estimated the physical damage to Gaza “at around \$18.5 billion”, which they note “is equivalent to 97% of the combined GDP of the West Bank and Gaza in 2022.” The UN Commission on Trade and Development estimated Gaza’s 2022 GDP at \$2.72 billion. In other words, since October 7 Israel has caused physical damage to Gaza equivalent to 6.8 times Gaza’s annual GDP.