



Appendix to letter of July 25, 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 108 journalists and media workers were among the more than 39,000 killed since the war began, making it the deadliest period for journalists since CPJ began gathering data in 1992.*  
[Committee to Protect Journalists](#), July 24, 2024

This appendix complements the letter sent to President Joseph R. Biden and others on July 25, 2024 by American physicians who have served in the Gaza Strip. It is divided into four sections. The first explores the evidence of the likely 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.

### **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. At least 809 were civilians (72%), including at least 40 minors, as well as 314 Israeli military and security personnel (28%). Since then, as of July 3 an additional 332 Israeli military personnel have been [reported](#) killed in Gaza, bringing the total to at least 1,455 people killed, 44.4% military and security personnel and 55.6% civilians.

As of July 24, since October 7 [Israel has killed](#) at least 39,145 Palestinians through military violence in Gaza. As of April 30, 24,686 of these bodies have been fully identified by the Gaza Health Ministry: 32% of fully identified casualties are children, 20% are women, and 8% are elderly people. An additional 10,000 bodies were [estimated](#) to be buried under the rubble of destroyed buildings on May 2. 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 confidently [cited](#) these numbers in testimony before the House Armed Services Committee.
- The State Department [cited](#) the Gaza Ministry of Health data 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. 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 any major and protracted conflict.

Hunger in Gaza is not being caused by the unavoidable societal disruption that accompanies war. Israel is deliberately starving Gaza, as is widely acknowledged. For example:

- According to [Human Rights Watch](#), since October 7 the “Israeli government is using starvation of civilians as a method of warfare in the Gaza Strip.”
- 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.
- World Food Programme Executive Director Cindy McCain [stated](#) on May 5 “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” 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.”
- In June 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.”

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

According to the IPC, [in December](#) 377,000 Palestinians in Gaza were in the catastrophe phase of food insecurity and 939,000 were in the emergency phase. 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. At these rates, the most conservative estimate that can be made is that 30,000 people have died in Gaza from starvation since December. Utilizing the far worse IPC report from March adds an additional conservatively estimated 7,786 deaths from starvation in Gaza. **In total it is likely that 37,786 people have died of starvation and its complications in Gaza since October 7.**

**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 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.

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 matches or even exceeds the death toll from violence in Gaza. We hope and pray that starvation is not already 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 16, the ReliefWeb Unified Health Dashboard [reported](#) 923,000 cases of acute respiratory infections, 527,000 cases of acute watery diarrhea and 11,000 cases of bloody diarrhea, and 92,000 cases of acute jaundice in Gaza since October 7. 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 the 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 km<sup>2</sup> in area....it is estimated that the population density within the zone could exceed 28,000 person/km<sup>2</sup>. 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.**

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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 39,145 who are confirmed killed by military violence as of July 24, 2024. **With the known violent deaths, the estimated ten thousand people buried under the rubble and certainly dead, a conservative estimate of 38,000 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 likely upwards of 92,000, agreeing quite closely with the projected estimates cited above. This represents a shocking 4.2% 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 July 24, 2024. *It is highly likely that the real number of deaths in Gaza from this conflict is far higher, and without an immediate ceasefire the death toll will only continue to mount.***

#### **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 April 30, 7,797 *fully identified* children are [known](#) to have been killed by Israeli violence in Gaza. (April 30 is the last time the Gaza Ministry of Health was able to issue new categorizations for fully identified corpses in Gaza's morgues.) **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, as [reported](#) on May 1 at least 14,500 children had been killed in the span of seven months. 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 14,500 children killed in the seven months from October 7 to May 1, the rate is 3.1 children killed per 100,000 people per day. **The rate of killing of children in Gaza since October 7 is 584 times higher than in Ukraine in 2022. Even if we only consider the 7,797 fully identified children who have been killed the rate of killing of children is still 314 times higher in Gaza than in Ukraine. No other conflict in living memory has killed 1.6% of the children in any territory in seven months through violence alone.** This is the population-adjusted equivalent of 1.2 million 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 [recorded](#) execution by sniper of 3-year-old Emad Abu al-Qura 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 saw multiple children shot in the head and/or chest during their time in Gaza, usually on a daily basis. It “is notable”, found 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. As of April 18, Israel had killed at least 261 teachers and 95 university professors in Gaza. No child in Gaza has attended school in more than nine months. 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 July 24, 20 of Gaza’s 36 [hospitals](#) are completely out of service, while 16 remain partially functional. 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 359% of their actual bed capacity. 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.

From October 7 to April 20, Israel [carried out](#) 435 attacks on medical facilities and healthcare workers, killing 723 people and detaining 118 health workers. Of the 160 Palestine Red Crescent Society [ambulances](#) in the Gaza Strip, 25 have been destroyed and 29 damaged, while 17 PRCS staff and volunteers have been killed, 35 seriously injured, and five taken by Israel. Gaza Ministry of Health ambulances have [fared](#) even worse than those of the PRCS, with 126 damaged or destroyed by April 3. **As of June 26, the British charity Medical Aid for Palestinians [reported](#) that 500 healthcare workers had been killed in Gaza. “This equates to an average of two healthcare workers killed every day, with one in every 40 healthcare workers, or 2.5% of Gaza’s healthcare workforce, now dead. More healthcare workers have been killed in Gaza since October than were reported killed in all conflicts globally in 2021 and 2022 combined.”**

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 1.11 in Gaza and 0.059 in Ukraine. Thus, the rate of attacks on healthcare facilities and personnel in Gaza is 19 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 90,000 of whom have been [injured](#) by military weaponry in the past ten 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. 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.”

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.