

War and Health: the devastating impact of conflict on Wellbeing and Humanitarian Crises

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Summary

Health is a precious asset, essential for both individuals and communities. The wars that have affected various parts of the world in recent years have had a detrimental impact on health, leading to malnutrition and an increased vulnerability to epidemic diseases among the population, especially the poorest.

Hospitals and healthcare facilities themselves have become primary strategic targets in many war zones. The destruction of infrastructure and hospitals, along with challenges in obtaining clean

water and access to medicines, has contributed to the resurgence of epidemic diseases in countries where they had been eradicated. Additionally, the difficulty in ensuring vaccination programs for children raises the risk of these diseases spreading to areas typically free from them.

The authors reflect on the consequences of wars on the health of populations and the close link between health and peace, presenting the latest data on ongoing epidemics in countries affected by war.

The diseases caused by the conflicts that have been raging in many parts of the world in recent years demonstrate once again the close link between health and peace.

Health is a precious asset, one that is fundamental for both the individual and the community. Unfortunately, however, war has a deleterious effect on health, causing malnutrition and a predisposition to epidemic diseases in the population, especially among its poorest members [1]. Even hospitals and health facilities have become major strategic targets in many theatres of war [2], despite the fact that the Geneva Conventions clearly state that in no case can healthcare facilities and personnel be targeted by military operations [3].

People’s health is constantly endangered by wars, as well as by the famines and infectious diseases that follow. For instance, in 2022, cholera broke out again in Syria [4], a country that has been the scene of a bloody war for almost 15 years, and was further devastated by a destructive earthquake in February 2023.

Massive displacements of people have undermined sanitation and waste management systems. Compounding this issue are the significant reductions in functioning health facilities, which are becoming increasingly overcrowded, a shortage of medical supplies and a lack of healthcare personnel. Water resources are increasingly scarce and the population is very often forced to drink unsafe water [5].

A similar situation has emerged in Sudan, although this country remains almost entirely absent from global news and debate, partly because the U.S. and European

nations are preoccupied with the conflicts in Ukraine and Gaza, which are consuming their political and military resources. As a result, in Sudan there has been little international assistance, and healthcare facilities, around 70% of which are not operating at full capacity, are severely under-resourced [6].

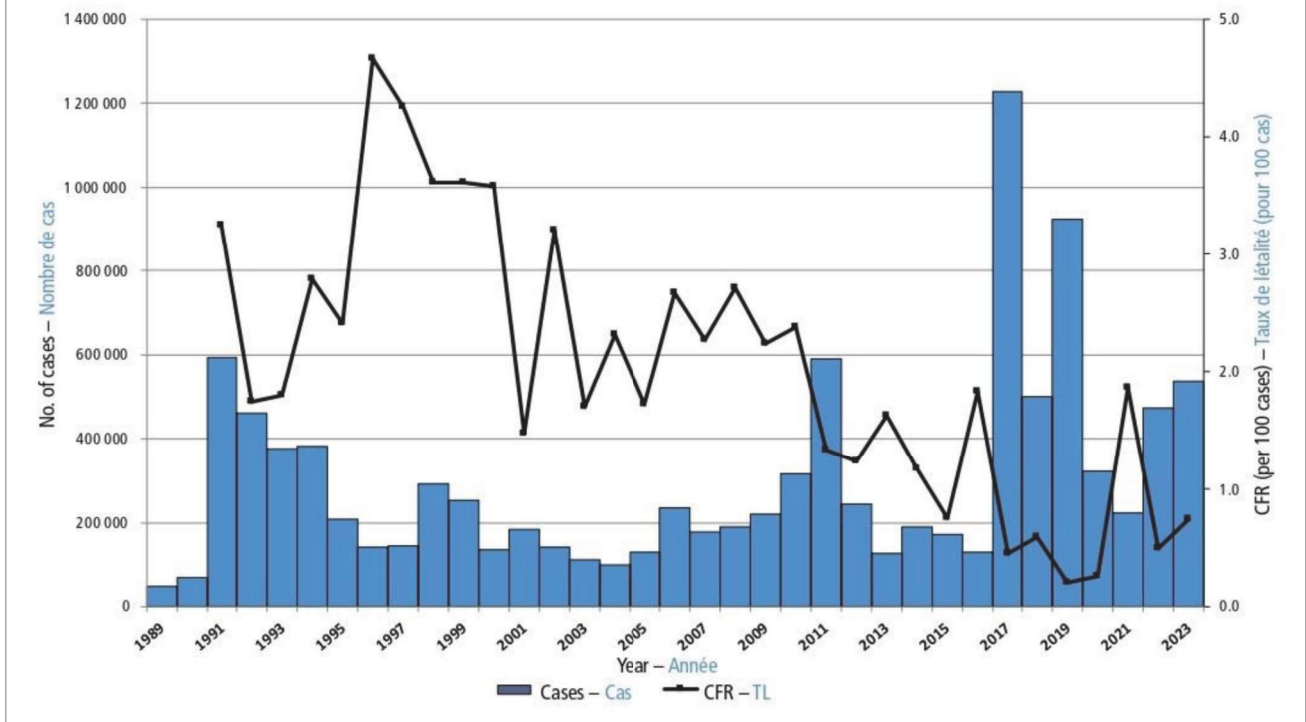
Due to the civil war that broke out in April 2023, 14 million children in Sudan have been left to fend for themselves. As the war rages on, famine and disease are on the rise [7].

The World Health Organization has reported that yet another cholera epidemic was officially declared by the Federal Ministry of Health (FMoH) on 12 August 2024, following a new wave of cholera cases was documented on 22 July 2024. The previous epidemic had technically ended in June 2024. Between 22 July and 1 September, a total of 2,895 cholera cases were reported, resulting in 112 associated deaths and a case fatality rate (CFR) of 3.9% [8].

Unfortunately, cholera cases in the world have been significantly increasing over the past three years, with conflicts and the destruction of infrastructure contributing to this rise, as shown by data from the Weekly epidemiological record, published on September 6, 2024 [9] (Fig. 1).

Similarly, in the spotlight of the international media, the lives of the Ukrainian people are at risk not only due to attacks by the Russian armed forces, but also because of the destruction of many infrastructures and hospitals, as well as the difficulty of obtaining medicines and vaccinating children. In this scenario, the population

Fig. 1. Annual cholera cases and case fatality rate (CFR) reported by year, 1989-2023 (Data World Health Organization. Weekly epidemiological record n. 36/2024).



is in constant danger of the spread of epidemic diseases such as measles [10], poliomyelitis [11] and tuberculosis [12].

Another country to consider is Yemen. After a decade of conflict, it is in economic collapse, with poverty, mass population displacement and a destroyed healthcare and social system.

In Yemen, measles and rubella are the main causes of child mortality and congenital disabilities, yet both diseases can be prevented and avoided through vaccines.

A huge number of children are unvaccinated; Save the Children data published in June 2024 shows that the percentage of children who have never had a routine vaccination - defined as “zero-dose” children - is three times higher in conflict zones (22.7%) than elsewhere around the world (7.1%) [13].

In countries such as Sudan, Yemen and Syria there are almost 87% of the total “zero dose” children.

At the end of November 2023, according to the World Health Organization (WHO) 50,795 suspected cases of measles and rubella were reported in Yemen, associated with more than 560 deaths: a strong increase compared to the 27,000 suspected cases and 220 deaths recorded in 2022 [14].

According to WHO and UNICEF data, the number of children worldwide who received three doses of diphtheria, tetanus, and pertussis (DTP) vaccine in 2023 – a key indicator for global immunization coverage – amounted at 84% (108 million).

At the same time, the number of children who did not receive a single dose of vaccine increased from 13.9

million in 2022 to 14.5 million in 2023 [15]. The latest trends show that many countries don't vaccinate the children because several parents have doubts about the effectiveness and safety of vaccines so many children not vaccinated can transmit vaccine-preventable diseases at schools and in the community.

This is hands down a dangerous situation for the children; we also point out that half of the unvaccinated children in the world live in 31 countries affected by conflict, and in those geographical areas they are at risk of contracting some preventable diseases due to the lack of food and health services for the population [16].

Among the numerous ongoing conflicts, the disastrous situation in the Gaza and the West Bank must warrants attention. The Israeli-Palestinian conflict has been marked by repeated violations of international human rights. An investigation by The Guardian newspaper, Amnesty International and the Human Rights Watch documented as early as 2009 the exploitation of Gaza's civilian population as human shields and the use of white phosphorus in military operations [17].

As of today, 1.9 million people in Gaza, out of a total population of 2 million, are displaced. They live in makeshift shelters and overcrowded refugee camps, which they are often forced to abandon to avoid being targeted by Israeli bombings. In the Gaza Strip, 31 out of 36 hospitals have been damaged or destroyed due to Israeli attacks. The region's infrastructure has been completely devastated, with the waste and sewage disposal network demolished, and access to drinking water is critically limited.

Fig. 2. Polio cases detected worldwide as of August 2024 (data "Global Wild Poliovirus 2017 - 2024". Global Polio Eradication Initiative GPEI, 24 August 2024).



Country	Wild cases	Circulating vaccine-derived cases	Transmission status	Type
Afghanistan	18	0	endemic	WPV1
Pakistan	16	0	endemic	WPV1
Nigeria	0	49	cVDPV only	cVDPV2
Yemen	0	33	cVDPV only	cVDPV2
DRC	0	59	cVDPV only	cVDPV1 cVDPV2
Ethiopia	0	11	cVDPV only	cVDPV2
Niger	0	9	cVDPV only	cVDPV2
South Sudan	0	8	cVDPV only	cVDPV2
Chad	0	8	cVDPV only	cVDPV2
Indonesia	0	7	cVDPV only	cVDPV2
Angola	0	6	cVDPV only	cVDPV2
Guinea	0	5	cVDPV only	cVDPV2
Somalia	0	3	cVDPV only	cVDPV2
Liberia	0	1	cVDPV only	cVDPV2
Mali	0	1	cVDPV only	cVDPV2
Benin	0	1	cVDPV only	cVDPV2
Mozambique	0	1	cVDPV only	cVDPV1
Palestine	0	1	cVDPV only	cVDPV2
Total	34	158		

A similar scenario is now being seen in Lebanon, where approximately 346,000 people have been forced to leave their homes due to the ongoing violence stemming from Israeli strikes and attacks. Moreover, the government states that this number could grow to 1 million, with a significant portion of those displaced being women and children. Once again, the humanitarian situation is alarming, as displaced families struggle with inadequate access to basic needs such as food, water, and healthcare. Women and children, in particular, face heightened risks of exploitation and abuse in such chaotic environments [18].

In July 2024, the United Nations Children's Fund (UNICEF) and the World Health Organization (WHO) reported the high risk of the spread of polio in Gaza, following the detection of viral traces in six wastewater samples in the central part of Gaza in June. Moreover, on August 23, polio was confirmed in an 11-month-old boy, who was left paralyzed. In this situation, tens of thousands of children under five years old are now at risk of contracting polio; indeed, 50,000 children have been born in Gaza alone since October 2023, and thus are without vaccination coverage.

From the latest data provided in August 2024 by the Global Polio Eradication Initiative (GPEI), it is evident

that polio tends to recur constantly. In addition to the two countries where it remains endemic, Afghanistan and Pakistan, polio is also present in those countries that are characterized by conditions of extreme poverty due to environmental phenomena and wars (Fig. 2).

Despite these challenges, an agreement was reached that allowed for more than 640,000 children under the age of 10 to begin receiving the new oral polio vaccine type 2 (nOPV2), starting from the 1st of September. During the first round of an emergency vaccination campaign conducted in three phases from September 1 to 12, 2024, approximately 560,000 children under ten were vaccinated against polio in the Gaza Strip [19].

This urgent, temporary humanitarian response aimed at preventing the spread of polio, which has resurfaced in Gaza after 25 years with the circulating variant of poliovirus type 2 (cVDPV2). All parties are respecting this humanitarian pause, and there is hope from various stakeholders that this positive momentum will continue. This will not only facilitate the vaccination of children against polio but also to prevent or treat the many other infectious diseases that can spread at any moment in this devastated land.

However, for a polio vaccination campaign to be effective, it must be able to reach at least 95% of children, and it is clear that such a percentage is difficult to achieve in any country at war. Furthermore, it is evident that vaccines alone can only be part of the effort to stop the spread of the virus. To prevent future epidemics, whether in Gaza, Ukraine, Sudan or Lebanon peace and health equality must be restored.

Only by restoring peace can we guarantee access to healthcare, vaccines, and medicines for the entire population. Ensuring access to safe, clean and treated water, along with adequate hygiene facilities, is essential for preventing the spread of infectious diseases.

Any ceasefire or pause in hostilities will be crucial, such in the case of Gaza, is crucial for enabling full humanitarian access, not only to vaccines but also to the full range of assistance necessary to support the basic needs of civilians.

Moreover, to ensure safe and sustainable access to healthcare, advocating for peace and finding solutions to ongoing conflicts must remain an absolute priority. It is essential to allocate resources to healthcare aid and personnel. Only in this way can we effectively control epidemic outbreaks that could otherwise escalate severely at any moment.

Support for peace is therefore essential from a healthcare perspective to limit epidemics and save a significant number of lives. It is clear that peace is equally crucial in preventing these epidemics from spreading to countries—such as those in Europe—that seem secure. In these regions, outbreaks could have serious health consequences for the population, partly due to declining vaccination rates. Over the past 15 years, the great clinical success of vaccinations has, in a way, also created its paradoxical limitation. In

wealthy, developed Western countries like the United States and those of Western Europe, the disappearance or significant reduction of infectious diseases has diminished the perceived importance of vaccination. At the same time, the increased use of the internet and social media as sources of information has contributed to spreading news sometimes lacking any scientific basis. In addition to misinformation, there is the attitude of those who, in the face of the highly unlikely risk of an adverse vaccine reaction, overlook the clear benefits of immunization against disease, allowing doubts and suspicions to guide them. This fuels vaccine hesitancy, which, as history shows, has existed since Edward Jenner's discovery of the vaccine in the late 18th century [20]. Today, however, it is reaching levels that threaten herd immunity.

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Authors' contributions

DO: designed the study. MM e DO: conceived the manuscript. MM e DO: drafted the manuscript. LV, RP: preliminary revision of the manuscript. MM, DO, LV, EM: performed a search of the literature. LV, EM, RP: critically revised the manuscript. LV, EM, RP: conceptualization, and methodology. LV e EM: investigation and data curation. MM e DO: original draft preparation. LV e EM: editing. All authors have read and approved the latest version of the paper for publication.

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