***Introduction:***

Access to safe water, sanitation, and hygiene (WASH) is a fundamental human right and a critical determinant of public health. However, the global burden of disease attributable to inadequate WASH services remains unacceptably high, with significant disparities across countries and regions. This report synthesizes findings from two recent studies - the WHO Global Health Observatory data on WASH deaths in 2019 [1] and a WHO report on the potential lives saved by improving WASH access [2] - to highlight the urgent need for action and investment in WASH services.

***The Problem: Global Inequality in WASH-Related Mortality***

The WHO's Global Health Observatory data reveals a stark imbalance in deaths attributable to unsafe water, sanitation, and hygiene across countries and regions [1]. In 2019, WASH-related mortality rates ranged from over 100 deaths per 100,000 population in countries like the Central African Republic and Chad to less than 1 death per 100,000 in high-income nations like Qatar and Finland. This glaring inequality in a fundamental determinant of health is unacceptable and requires immediate action.

***Key Insights***

- Low-income countries, particularly in Sub-Saharan Africa, bear a disproportionate WASH mortality burden [1].

- India and Nigeria account for over 55% of the 1.19 million global WASH deaths in 2019, reflecting the compounded risk of large populations and inadequate services [1].

- Significant gender inequality exists in WASH mortality within certain countries, with female death rates exceeding male rates by up to 68% [1].

- Outlier countries like Russia and Indonesia have substantially higher WASH mortality compared to development peers, indicating lagging infrastructure [1].

***Impacts on Health, Society, Environment, and Carbon***

Health:

WASH-related diseases, such as diarrhoea, cholera, and typhoid fever, are major contributors to morbidity and mortality in low-income countries [1]. Diarrhoeal disease alone accounted for over one million deaths and 55 million DALYs in 2019 [2]. Poor WASH access can lead to repeated infections, worsening malnutrition and stunting in children, and reducing overall life expectancy [1,2]. Addressing WASH inequalities can substantially improve public health outcomes and reduce healthcare costs in high-burden countries.

Society:

Inadequate WASH access disproportionately affects women and girls, who often bear the responsibility for water collection and household hygiene [1]. In countries with high WASH mortality rates, women may spend several hours daily fetching water, missing out on education and economic opportunities [1]. Investing in WASH can enhance gender equity and social development [1,2].

Environment:

Poor sanitation and wastewater management practices associated with high WASH mortality rates can have detrimental environmental impacts [1]. Open defecation and improper sewage disposal can contaminate water bodies, harming aquatic ecosystems and biodiversity [1]. Improving sanitation infrastructure and promoting safe waste management can mitigate these environmental risks and promote sustainable development [1,2].

Carbon Intensity:

WASH interventions have the potential to reduce carbon intensity in several ways [1]. Expanding access to safe water can reduce the need for energy-intensive water treatment processes and the use of bottled water, which has a high carbon footprint [1]. Proper wastewater treatment can capture methane, a potent greenhouse gas, and potentially use it as a renewable energy source [1]. However, it is essential to consider the carbon footprint of WASH infrastructure construction and operation, favouring low-carbon technologies where possible [1].

***Recommendations***

1) Radically accelerate action to make safe WASH a reality for all, focusing on the poorest and most disadvantaged populations [2].

2) Increase targeted aid and technical assistance to high WASH mortality countries, prioritizing sub-Saharan Africa and South Asia [1].

3) Provide incentives for water utilities to expand infrastructure to underserved rural areas in outlier middle-income nations [1].

4) Incorporate WASH targets into national climate plans, capturing methane reduction and resilience benefits, and unlock climate financing [1].

5) Strengthen data systems tracking WASH coverage and water quality to guide evidence-based policymaking and investments [1,2].

***Assumptions and Limitations***

- WASH mortality estimates rely on robust civil registration and disease surveillance systems, which may be incomplete in lower-capacity countries [1].

- Classifying deaths as WASH-related requires accurate cause-of-death data. Misclassification or underreporting of diarrheal and enteric deaths may underestimate WASH burden [1].

- The state of WASH infrastructure is inferred from mortality data as a proxy, but actual levels of safe water and sanitation access may vary [1].

- The true burden of disease attributable to unsafe WASH is likely to be much higher, as the estimates only considered four health outcomes for which data were available [2].

***Map Evaluation:***

The world map visualization illustrates the mortality rate attributed to unsafe water, sanitation, and lack of hygiene, also known as the WASH mortality rate, across different countries. The colour scale on the left indicates the range of mortality rates, with darker shades of red representing lower mortality rates, transitioning to light red, white/greyish, light blue, and finally, dark blue representing the highest mortality rates.

According to the scale, the countries with the lowest WASH mortality rates, shown in dark red, have approximately 15,000 deaths per year. The second lowest category, in a slightly lighter shade of red, represents countries with around 30,000 deaths annually. Countries in white/greyish have moderate mortality rates, falling between 30,000 and 84,000 deaths per year. The second highest category, in light blue, represents countries with around 84,000 to 498,000 deaths annually. The countries with the highest WASH mortality rates are shown in dark blue, indicating approximately 498,000 deaths per year.

The map reveals a stark global inequality in WASH-related mortality. India stands out with the darkest shade of blue, indicating the highest number of WASH-related deaths worldwide, likely due to its large population combined with inadequate WASH services. Several countries in Sub-Saharan Africa, particularly in Central and West Africa, also have blue, white and greyish indicating high mortality rates.

In contrast, most countries in Europe, North America, and Australia have the darkest shades of red, indicating the lowest WASH mortality rates. This disparity highlights the urgent need for targeted interventions and investments in WASH infrastructure in high-burden regions to close the global gap in access to safe water and sanitation.

The report's findings align with the patterns shown in the map. For example, the report states that India and Nigeria alone account for over 55% of the 1.19 million global WASH deaths in 2019, which is evident from their dark blue shading on the map. The report also mentions that 9 out of the 10 countries with the highest WASH mortality rates are in Sub-Saharan Africa, which is clearly visible in the concentration of dark and lighter colours in that region.

By presenting the data in a visually striking manner, the map effectively communicates the global inequalities in WASH-related mortality and reinforces the need for urgent action to address this critical public health issue. The colour scale, ranging from dark red (lowest mortality rates) to dark blue (highest mortality rates), accurately reflects the data presented in the report and highlights the region’s most severely affected by inadequate WASH services.

A map of the world

Description automatically generated

***Conclusion***:

The global burden of disease attributable to inadequate WASH services is unacceptably high, with over 1.4 million preventable deaths and 74 million DALYs in 2019 [1,2]. The stark inequalities in WASH access and mortality across countries and regions underscore the urgent need for targeted interventions and investments in WASH infrastructure, particularly in low-income countries and marginalized communities. Improving WASH services can yield substantial health, social, environmental, and economic benefits, contributing to the achievement of the Sustainable Development Goals and a healthier, more equitable world for all.

References:

[1] WHO Global Health Observatory data on WASH deaths in 2019

<https://apps.who.int/gho/data/node.main.INADEQUATEWSH?lang=en>

[2] Estimating the cost of interventions to improve water, sanitation and hygiene in healthcare facilities across India.

(21st December 2020)

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7754631/>