

# Bracing for El Niño

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**T**he World Meteorological Organization (WMO) recently warned that “the development of an El Niño will most likely lead to a new spike in global heating and increase the chance of breaking temperature records”. To better understand how this weather event is likely to affect the communities served by MSF, and therefore our operations, we asked Leo Tremblay, advisor to MSF Canada’s Humanitarian Action on Climate and Environment initiative (HACE), and Alan Gonzalez, OCG deputy Director of Operations:

## What is El Niño?

**Leo:** El Niño is a climate pattern that describes the unusual warming of surface waters in the eastern tropical Pacific Ocean. El Niño is the “warm phase” of a larger phenomenon called the El Niño-Southern Oscillation (ENSO). La Niña, the “cool phase” of ENSO, is a pattern that describes the unusual cooling of the region’s surface waters. El Niño has an impact on ocean temperatures, strength of ocean currents, the health of coastal fisheries, and local weather from the Americas

to Africa and beyond. The impact of El Niño on rainfall patterns across the globe in turn impacts the health of vegetation, agriculture, fisheries and climate-sensitive disease dynamics amongst other things.

## In which ENSO phase are we at the moment?

**Leo:** After almost 3 years of La Niña conditions, El Niño conditions have started in May 2023. The odds of the current El Niño becoming a strong event at its peak, at 56%, are pretty

good. Humanitarian actors should consider the potential impacts of an El Niño event later this year in key regions.

## What meteorological impacts can we expect?

**Leo:** No two El Niño events are the same, and other climate drivers will play a role. However, based on conditions associated with previous events, the following shifts in rainfall and temperature patterns, are expected if El Niño occurs:

## Expected shifts in rainfall and temperature in El Niño event<sup>1</sup>

| Région          | Changements dans les précipitations et les températures  |
|-----------------|--|
| Sahel           | Below-normal rainfall in southern areas during the height of the July-September rainy season.<br>→ Increased risk of droughts.   |
| Horn of Africa  | Above-normal rainfall in southern areas from September to January, including during the short rains season.<br>→ Increased risk of floods.   |
| Southern Africa | Below-normal rainfall during the southern hemisphere summer rainy season.<br>→ Increased risk of droughts.   |
| South Asia      | Below-normal rainfall in large parts of the region during the May-September monsoon season. Warmer than average, particularly in India.<br>→ Increased risk of droughts and extreme heat.  |
| Southeast Asia  | Drier and warmer than average in large parts of the region.<br>→ Increased risk of droughts and extreme heat.  |
| Caribbean       | Below-normal rainfall and hurricane activity during the Atlantic hurricane season, but above-normal rainfall from November to April, particularly in the central, northern and western Caribbean.<br>→ August to October: Reduced risk of hurricanes, increased risk of drought.<br>November to April: increased risk of flooding.   |
| Latin America   | Drier and warmer than average in Central America and north-east South America, including during the peak of the Central America rainy season from June-October.<br>→ Increased risk of drought, especially in the dry corridor.<br><br>Above average precipitation in parts of southern South America including southern Brazil, Uruguay and Argentina.<br>→ Increased risk of flooding. |

For areas already experiencing extreme rainfall deficits (e.g. the ongoing drought in the Horn of Africa), recovery will take a long time, even in the event of above-normal rainfall later in the year. Plants can be irreversibly damaged during drought stress, they can lose part of their water transport systems, and this damage can take years to recover. Droughts can also bring on more severe impacts on vegetation, like disease and fire, amplifiers that can last past the drought. For these reasons, recovery from drought is often longer than the drought itself<sup>2</sup>.

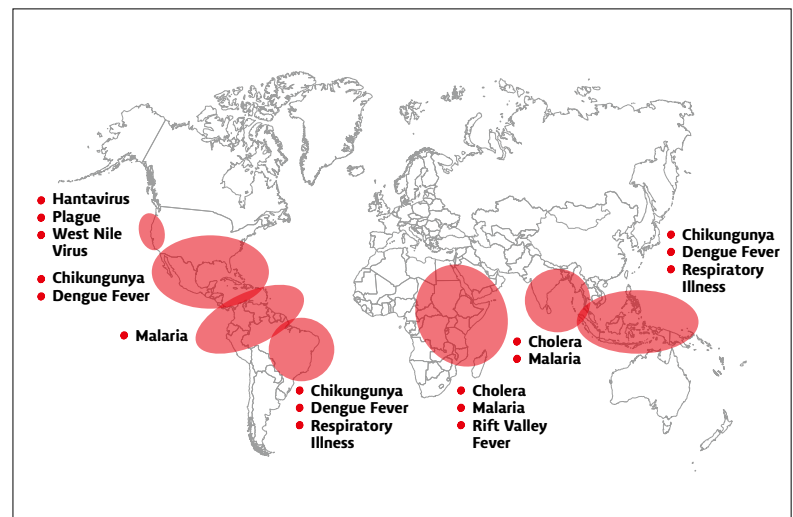
As considerable uncertainty remains around the El Niño event, its intensity, and the role of other climatic factors, seasonal forecasts from global, regional and national providers should continue to be monitored closely in the coming months.

### What is the relationship between El Niño and Climate Change

**Leo:** There is a belief among some scientists that El Niño events may be increasing in intensity and frequency due to climate change. However, the precise interaction between El Niño and climate change still remains uncertain.

This being said, the IPCC, the scientific body which evaluates and synthesises research on climate change, has determined that the impacts of El Niño and La Niña events are expected to be more severe as global temperatures rise. This is because warmer air has the capacity to hold more moisture, resulting in greater local rainfall during a comparable El Niño event. El Niño years typically see a rise of approximately 0.1 degrees Celsius in global surface temperatures, while La Niña years usually lead to a similar decrease. If El Niño occurs in 2023, global average temperatures could already exceed by 1.5-degree Celsius pre-industrial average temperatures.

### El Niño-associated enhanced disease transmission/burden in human populations<sup>3</sup>



### How are these expected meteorological events likely to impact infectious disease?

**Alan:** Shifts in rainfall, temperature and vegetation conditions which are characteristic of El Niño events, favor ecological conditions appropriate for some pathogens and their vectors to emerge and modulate disease transmission in certain regions. Based on previous El Niño events, most notably the strong 2015–2016 El Niño, various studies have sought to identify world regions and diseases which are particularly at risk of increased transmission during El Niño events. These have been compiled in a study, the key findings can be seen in the graph below. It is important to stress again that not two El Niño are alike and that many other factors are at play in driving the health situations we are responding to, including climate change, conflict, migration, as well as the resilience and adaptation capacity of affected communities.

### How are you using this climate data on El Niño?

**Alan:** Getting informed in advance on the changes in weather patterns is part of integrating a Planetary Health anal-

ysis in operations. It aims to strengthen our understanding of climate change and its related health and humanitarian consequences in order to prepare a better response in a changing environment. We are now in the process of discussing with operational teams to design plans to prepare for these consequences, keeping a macro level vision, acknowledging that missions have their role in the analysis at their level and adapt accordingly. But we can also see action which we can take at our level, like ensuring the availability of medical supplies (ringer lactate, NFI's, RUTE, etc.) close to the regions we know will be affected. Putting extra emphasis on training or learning-detachment in advance, or increasing regional surveillance are also examples of actions we are considering. ■

1 Adapted from the Inter-agency standing committee ENSO cell February 2023 update.

2 Schwalm, C., Anderegg, W., Michalak, A. et al. Global patterns of drought recovery. *Nature* 548, 202–205 (2017). <https://doi.org/10.1038/nature23021>

3 Adapted from Anyamba, A., Chretien, JP., Britch, S.C. et al. Global Disease Outbreaks Associated with the 2015–2016 El Niño Event. *Sci Rep* 9, 1930 (2019). <https://doi.org/10.1038/s41598-018-38034-z>