

OCTOBER 2022
CLIMATE
AND HEALTH
BULLETIN



MONTHLY DISEASE VIGILANCE FOR NIGERIA.

ISSUED: OCTOBER 1ST, 2022.

VALID UNTIL: OCTOBER 31ST, 2022.

CLIMATE OF OCTOBER

In October, the influx of moisture-laden southwesterly wind over most parts of the country is expected to persist.

The highlights of the Bulletin for October 2022 are as follows:

- The cumulative rainfall amount anticipated over Lagos, parts of Ogun Ondo, Edo and Delta state is above normal. Normal rainfall is predicted over the entire central and parts of the southern states while normal to below normal rainfall conditions are expected over the north and southeastern states.
- The predicted Minimum (night-time) and Maximum (daytime) temperature values over the country are predicted to be within the range of 16.0°C-28.0°C and 26.3°C-38.6°C, respectively.
- High vigilance for malaria is anticipated over the entire south including parts of the central states. Moderate vigilance is anticipated over a few states in the central region and low vigilance over the northern states.
- High vigilance for medicine instability is projected for the south to parts of the central states, while moderate vigilance is anticipated over most parts of the northern states as well as Plateau state.
- High vigilance is predicted for cholera over a few states in the south and the west while moderate vigilance is projected for Bayelsa, Delta, Lagos, and parts of Ogun states.
- High caution threshold of Heat Index is predicted over parts of Ogun, Anambra and Imo states and caution threshold is predicted in most parts of the country
- Floods could increase the risks of outbreaks of cholera and other water-borne diseases.
- It is necessary to note that during extreme weather events in October, vulnerable segments of populations like women, children, and the elderly may likely have an increased need for medical attention as they face a greater risk of poor health and even death. Therefore, the development of tailored approaches for supporting this at-risk population during extreme weather events is recommended.

1.0 GENERAL OUTLOOK FOR 1ST-31ST OCTOBER 2022.

In October 2022, the Inter-Tropical Discontinuity (ITD) is expected to oscillate around latitude 15°N (Figure 1). By implication, the moisture-laden south-westerly winds will infiltrate inland, transporting moisture over the entire country. Although the ITD position is anticipated to begin its southwards retreat, rainfall activities are expected to persist over the south, central and some parts of the northern cities. The predicted rainfall amounts across Nigeria for October 2022 show the prospect of above-normal rainfall over Lagos, Ogun, Delta and Bayelsa state, with a 45% probability. Normal to below normal rainfall is expected over the north, and parts of the south also with a probability of 45%. There is a 45% chance of the occurrence of normal rainfall over the inland of southwest and central region (Figure 2). The Probabilistic Multi-Model (PMM) Ensemble forecast from the World Meteorological Organization (WMO) lead centers corroborates the prediction for most parts of the country particularly for rainfall as depicted in Figure 3.

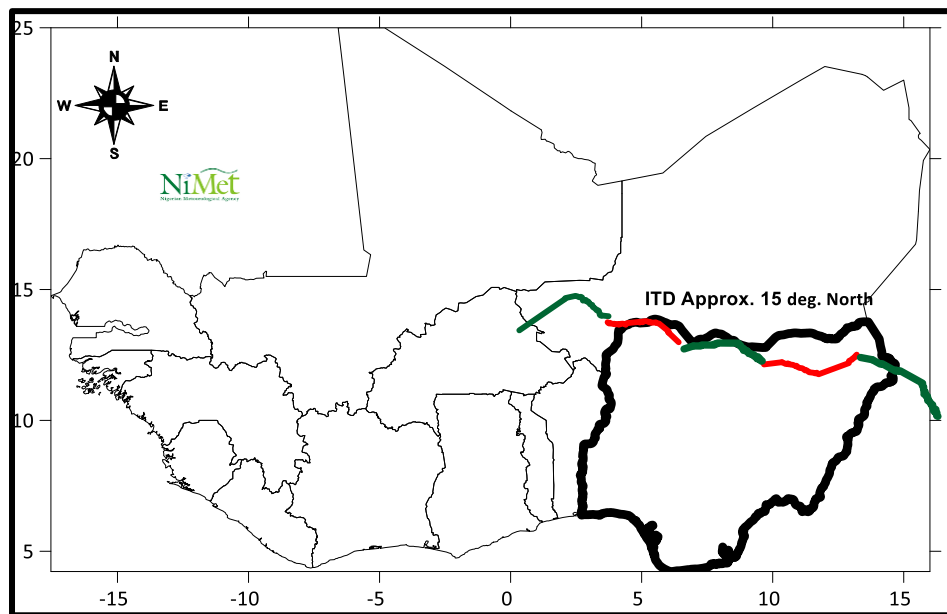


Figure1: Projected ITD position for October 2022

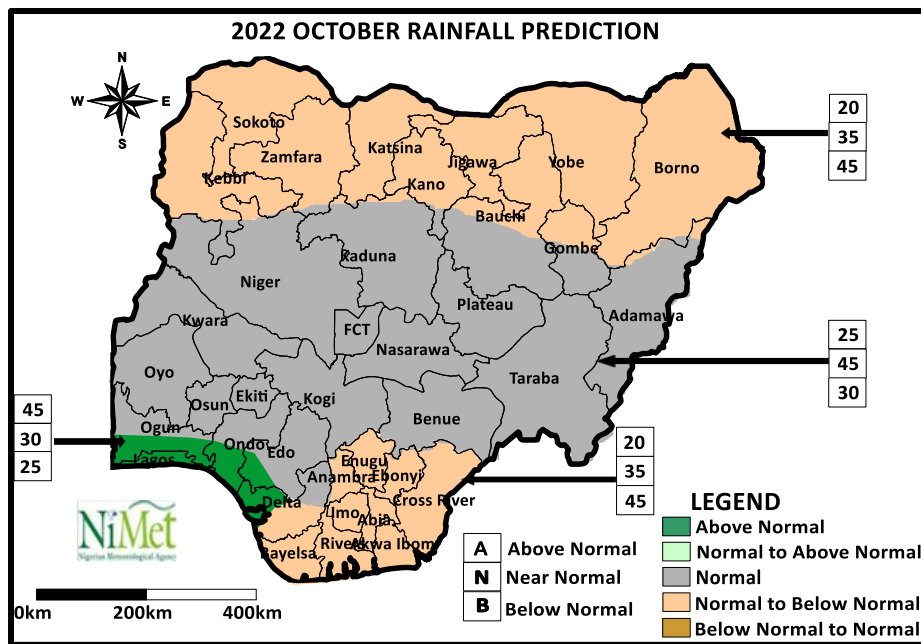


Figure 2: NiMet rainfall forecast for October 2022

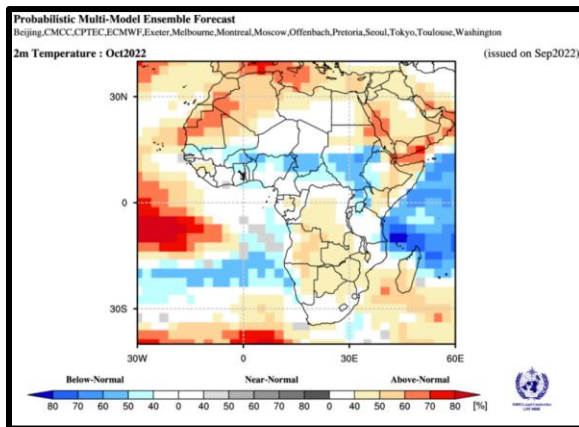


Figure 3: October Temperature Ensemble Forecast
Source: WMO Lead Centers

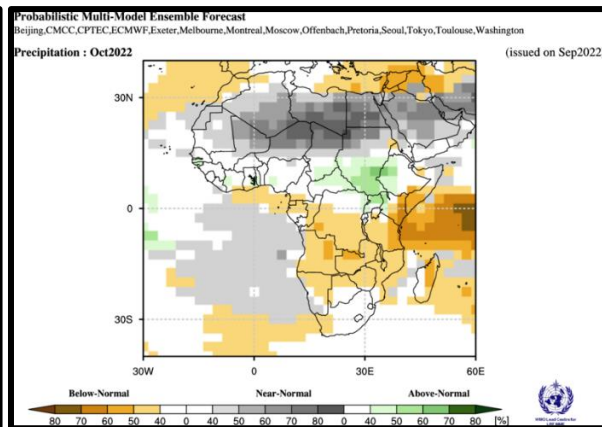


Figure 4: October Rainfall Ensemble Forecast
Source: WMO Lead Centers

2.0 FORECAST OF ATMOSPHERIC CONDITIONS FOR OCTOBER 2022

2.1 Rainfall: The cumulative rainfall amounts for October 2022 is predicted to vary across Nigeria from about 80.0 mm to 400.0 mm. Rainfall amounts of about 400mm are expected in the coastal states of Bayelsa and Delta. Amounts between 160mm and 320mm are expected over parts of the inland and central states, like Imo, Anambra, Enugu, Kwara, Abuja, Kogi and Abia. The northern and some parts of the central states are expected to record a cumulative rainfall amount of less than 80 mm. (See Figure 5)

2.2 Relative Humidity (RH): Relative humidity values across the country in October 2022 are expected to be between 40.0% and 98%. RH of over 90% is expected in some of the country’s coastal states (See Figure 6).

2.3 Mean Temperature: The distribution of mean temperature across Nigeria for October 2022 is shown in Figure 7. The greater portion of the country is predicted to record mean temperatures between 21.0°C and 31.0°C, while the lowest value of 21.6°C is expected over Plateau.

2.4 Maximum Temperature: As depicted in Figure 8, maximum temperatures across the country for October 2022 are expected to range from 27.0°C to 38.0°C, with the lower range anticipated over Jos in Plateau states and the upper range over Nguru in Yobe state respectively.

2.5 Minimum Temperature: The predicted minimum (nighttime) temperature distribution over Nigeria for October 2022 is shown in Figure 9 and is expected to range from 16.0°C to 28.0°C. The lowest value of about 16.0°C is anticipated over Plateau state, while the highest minimum temperature of about 28.0°C is anticipated over parts of Lagos and Ogun state.

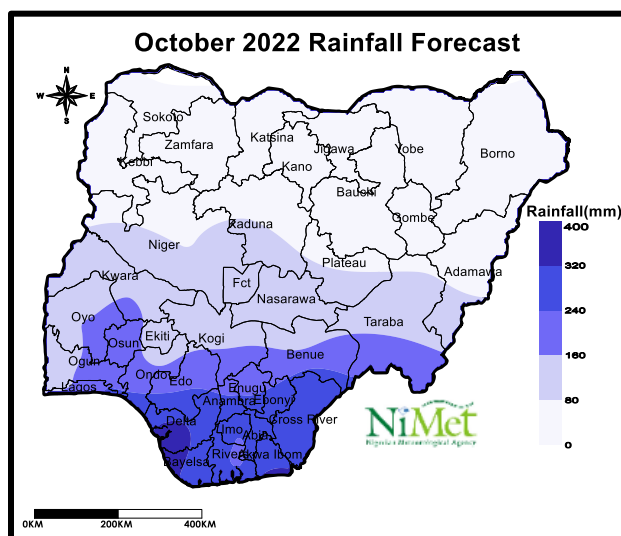


Figure 5: October rainfall amount forecast

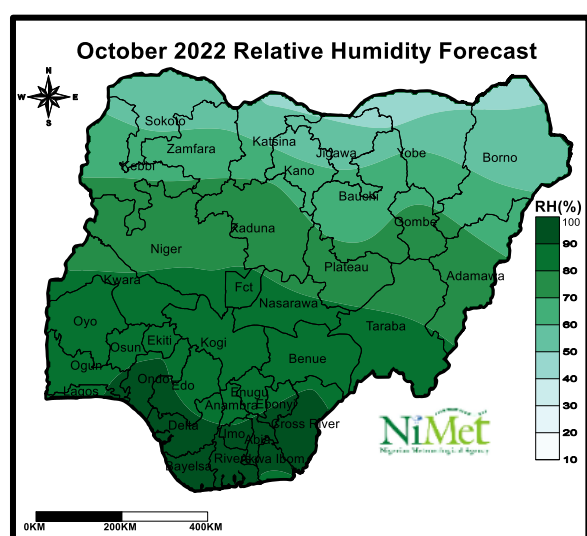


Figure 6: October relative humidity forecast

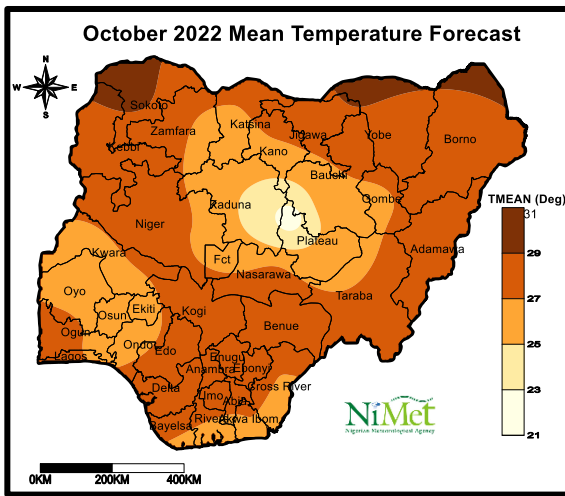


Figure 7: October mean temperature forecast

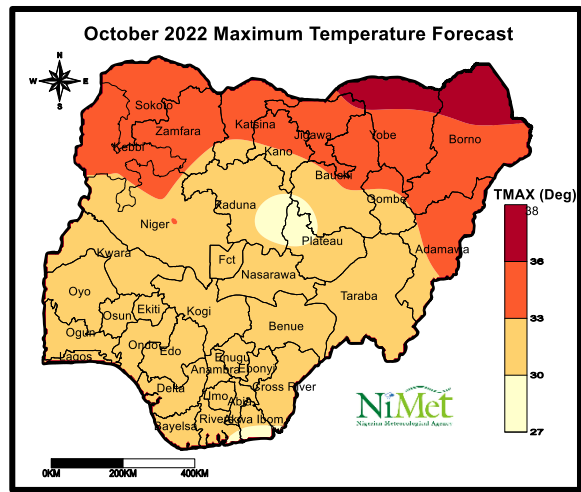


Figure 8: October maximum temperature forecast

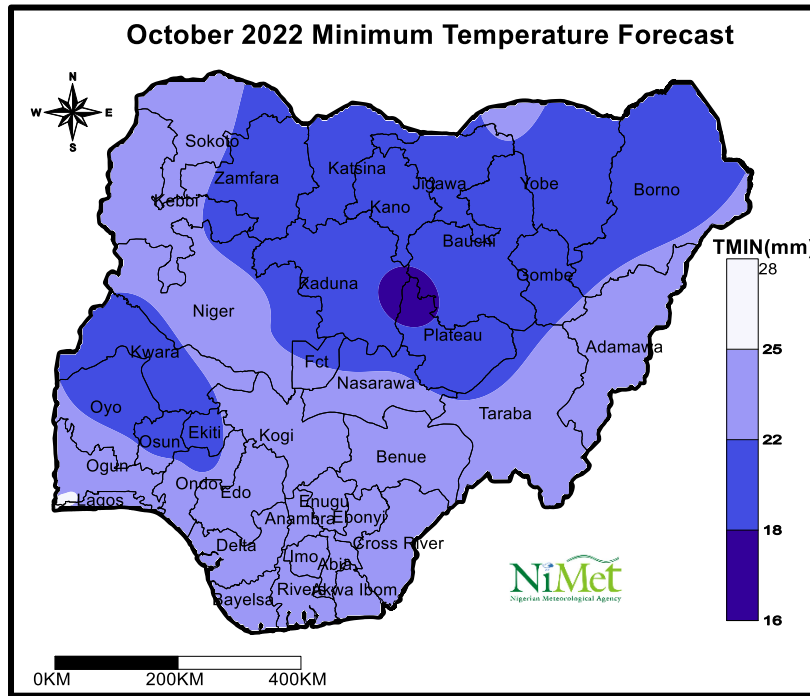


Figure 9: October 2022 minimum temperature forecast

3.0 CRITERIA FOR DETERMINING THE DEGREE OF VIGILANCE OF DISEASES AND OTHER WEATHER-RELATED PHENOMENA

According to the International Research Institute for Climate and Society, (IRI), *Seasonal Climatic Suitability* for malaria transmission is defined as the chance of precipitation accumulation greater than 80 mm, average temperature between 18°C and 32°C, and relative humidity greater than 60%. The combined values of these climate variables at a

given location or region are an indication of the lower limit for potential malaria transmission in the area. This implies that once these conditions are met, malaria cases are probable.

3.1 Malaria: The predicted conditions of rainfall, temperature, and relative humidity are used in determining the degree of vigilance for malaria. When rainfall is above 80 mm, the temperature is between 25°C and 32°C, and relative humidity is greater than 80%, the region is at high risk for malaria and is placed under *high vigilance*. When the temperature is between 20°C and 25°C, relative humidity is between 70% and 80%, and rainfall is above 80 mm, then *moderate vigilance* is advised. *Low vigilance* for malaria is issued when the temperature is in the range of 18°C-20°C, relative humidity is between 60% and 70%, and rainfall is above 80 mm. *No vigilance* is required when the temperature is less than 18°C or higher than 32°C, relative humidity is less than 60%, and rainfall amount is below 80 mm.

3.2 Cholera: In Nigeria, the outbreak and spread of cholera are usually more rampant during the rainy season. This could be attributed to the strong correlation between increased rainfall and flooding. High-intensity or long-duration of rains often result in flooding; especially in flood-prone areas or areas with poor drainages. In those parts of the country for which normal to above-normal rainfall has been predicted, there is a higher probability of flooding in October and consequently a greater risk of the cholera outbreak. This is because the bacteria that cause cholera are mostly found in the faeces of infected persons. Consequently, in places where open defecation is practiced, the faeces are easily transported by flood and deposited into water bodies that are used by people in the community for cooking and drinking. Even where latrines are available, increased rainfall may result in a surge in groundwater level, and sewer swell, producing polluted runoff that easily contaminates water basins.

3.3 Medication Stability: Medication or drug stability is defined as the ability of pharmaceutical dosage form to maintain the physical, chemical, therapeutic, and microbial properties during the time of storage and usage by the patient.¹ The composition of medicines is affected by weather conditions such as air temperature and relative humidity. When the maximum temperature is above 30°C and relative humidity

¹ Afifi N.A. (2016). Drug stability. Faculty of Vet. Med. Cairo University

exceeds 75%, the conditions are considered unsafe and unfavourable for the storage of medicines.

3.4 Heat Index (HI) is a measure of how hot the weather feels to the human body when relative humidity is factored with the actual air temperature. It is also known as felt air temperature and its unit is degree Celsius (°C) or degrees Fahrenheit (°F). HI is calculated using air temperature and Relative Humidity. The levels of caution for heat index are classified as follows:

- (i) **No Caution** when the HI is $\leq 26^{\circ}\text{C}$
- (ii) **Caution** HI is (27°C to 32°C)
- (iii) **High Caution** HI is (33°C to 39°C)
- (iv) **Danger** HI is (40°C - 51°C) and
- (v) **Extreme Danger** HI is ($\geq 52^{\circ}\text{C}$)

4.0 DISEASE VIGILANCE

4.1 Malaria

Based on the predicted values of climatic indices, malaria parasites are expected to persevere across the country (but in varying intensities) in October 2022.

4.1.1 Effects of Malaria

Malaria is a leading cause of illness and death, particularly in areas with high transmission rates. It has both economic and social implications and can strain the economy. Malaria is particularly detrimental to the health of pregnant women because their unborn babies could also be affected. The effects include maternal anaemia which is a condition in which one lacks enough healthy red blood cells to carry adequate oxygen to all parts of the body.

4.1.2 Malaria vigilance

- High vigilance for malaria is anticipated for the entire southern region of the country extending to the southern parts of some central states like Kwara, Niger, FCT, Nasarawa, Plateau, Taraba and Adamawa as shown in Figure 10.
- Moderate vigilance is required over parts of some central and northern states like Adamawa, Taraba, Plateau, Kaduna, Nasarawa, FCT, Niger and Kwara.
- Low vigilance is recommended over most northern states and parts of Adamawa, Taraba, Plateau, Kaduna, and Niger.

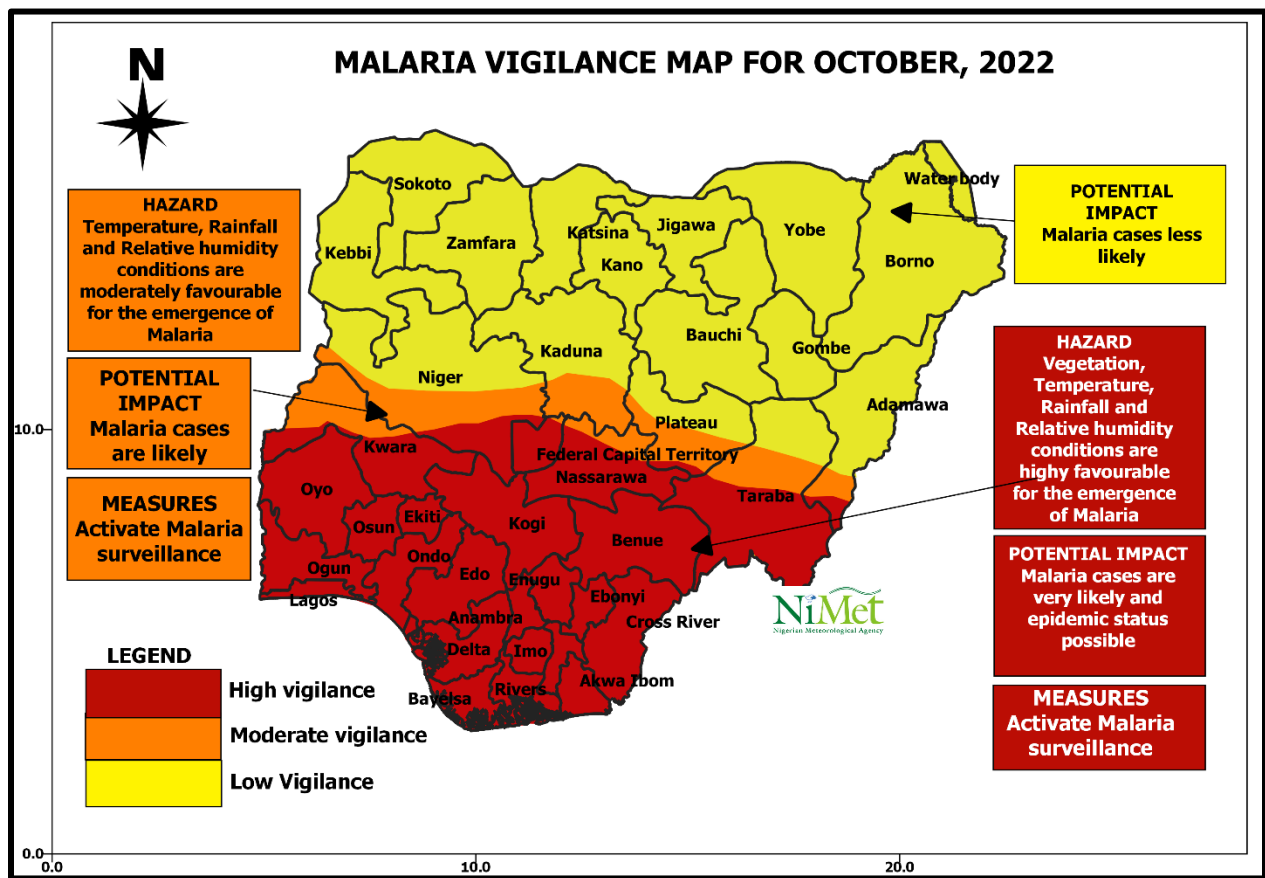


Figure 10: Malaria vigilance map for October 2022.

4.1.3 Advisories

- Avoid exposure to mosquitoes as much as possible
- Endeavor to see the doctor in the event of any illness and take medications as prescribed.
- Drainages should be cleared frequently, and the environment kept clean.
- Use insecticide-treated mosquito nets.
- Fumigate the environment frequently.
- Focus should be on early diagnosis and prompt treatment.
- Pregnant women are advised to take necessary measures to prevent being infected with malaria, such as sleeping under insecticide-treated mosquito nets and taking anti-malaria prophylaxis.

4.2 Cholera

There is a likelihood of the occurrence of cholera in some parts of the country. The projected levels of cholera vigilance across Nigeria in October 2022 are shown in Figure 11.

4.2.1 Effects of Cholera

This could lead to rapid loss of body fluids and by implication dehydration, shock, or even death.

4.2.2 Cholera vigilance

- High vigilance is required over a few states in the south such as Lagos, parts of Ogun, Ondo, Edo, Delta and Bayelsa states. (See Figure 11)
- Moderate vigilance is recommended for the north, the central region, inland parts of the south, and the coast of the southeast.

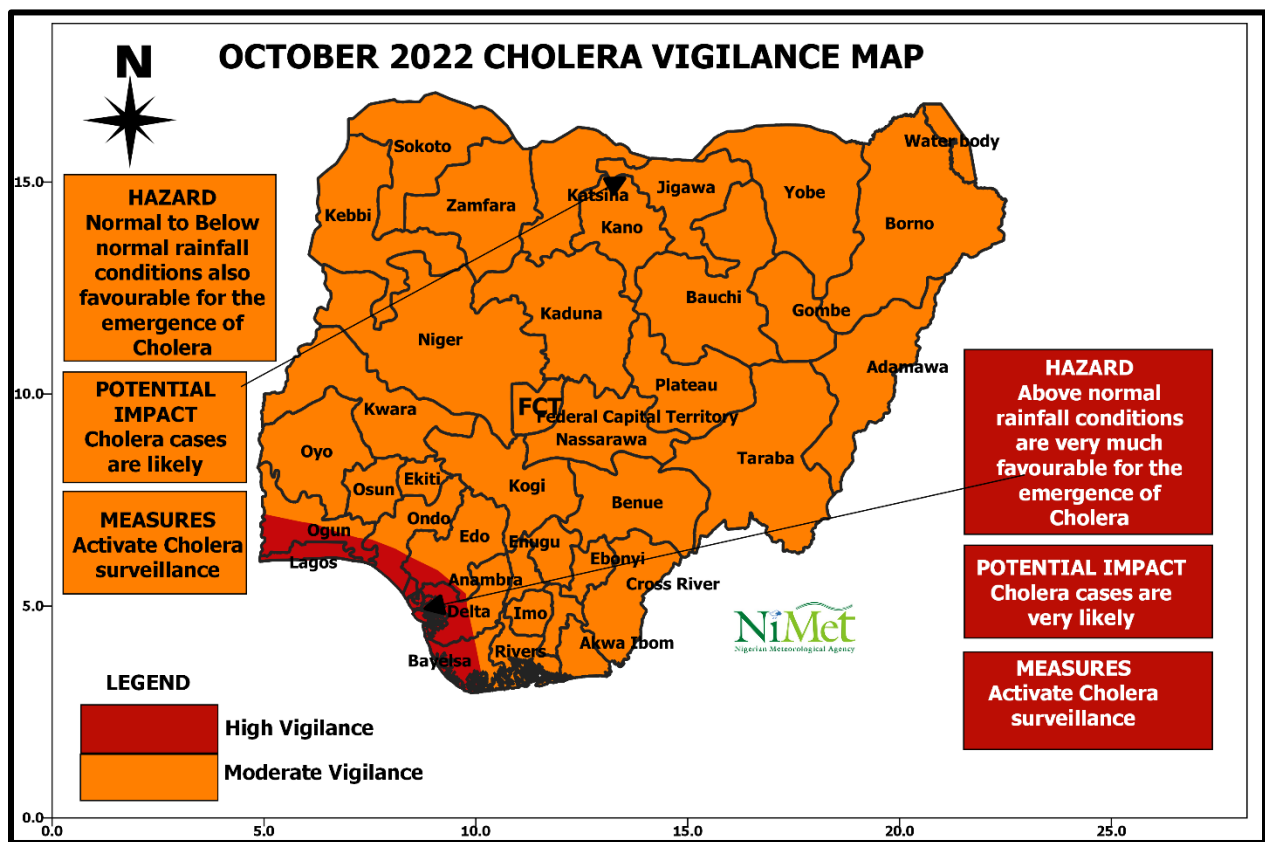


Figure 11: Cholera vigilance map for October 2022.

4.2.3 Advisories

The following precautions against cholera are advised:

- Frequent hand washing with soap.
- Ensure proper environmental sanitation.
- Ensure that food and water are not contaminated.
- Infected patients are advised to drink a lot of water and visit the hospital as soon as possible.

5.0 MEDICATION INSTABILITY

The predicted temperature and relative humidity values across the country for October 2022 satisfy the conditions for medication instability. Degradation of the composition of medicines is anticipated across the country. (See Figure 12).

5.1 Effects of Medication Instability

The conditions for medication instability outlined in Section 3.3 accelerate the degradation of medicines when they are stored under such conditions. Exposing medicines to these weather conditions increases the risk of reduced shelf life, compromise in shelf life could reduce the potency of medicines generally and for instance it could also predispose bacteria in humans to Anti-Microbial Resistance (AMR) to Antibiotic.

5.2 Medication Instability Vigilance

- High vigilance for medicine instability is required over the entire eastern, western, and southern states as well as most parts of the central states and some states in the north such as Niger, Kaduna, Bauchi, and Kebbi. See Figure 12.
- Moderate vigilance is recommended for most parts of the northern states including parts of Plateau state in the central region.

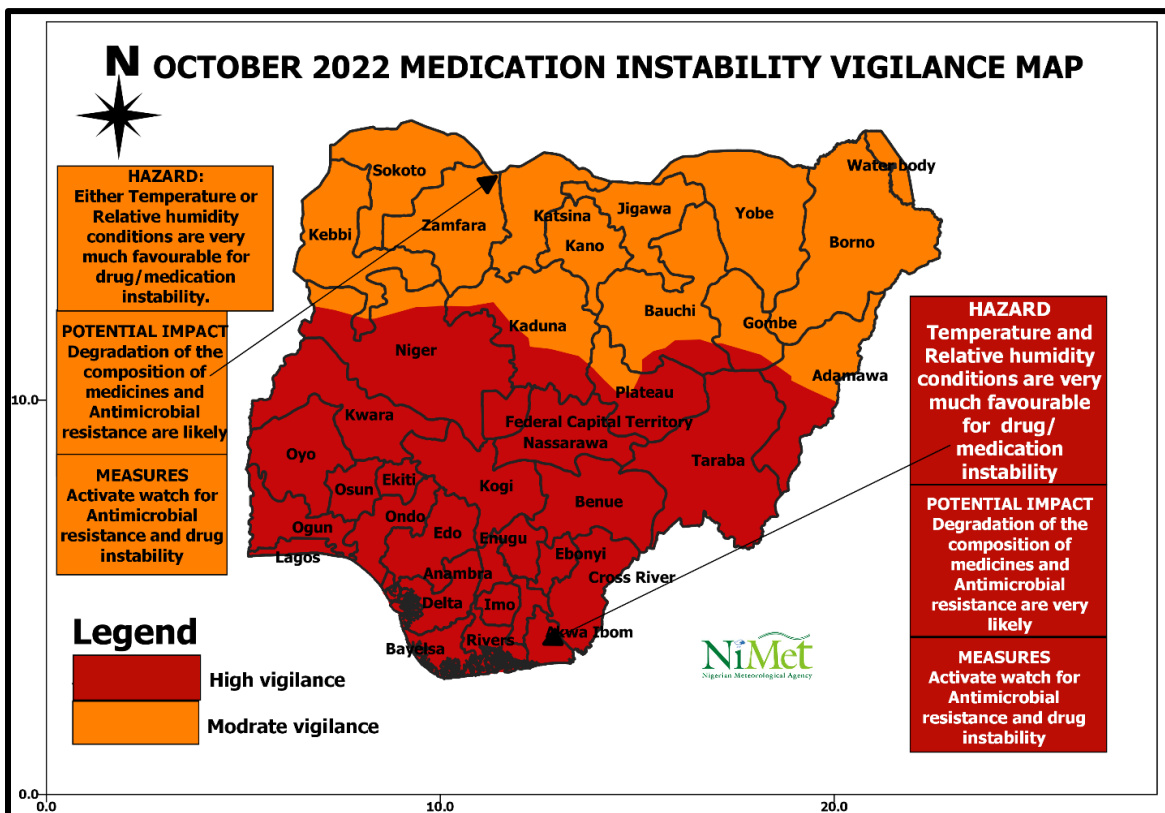


Figure 12: Medication Vigilance Map

5.3 Advisories

There is a need for more caution while transporting and storing medicines in those parts of the country with high vigilance thresholds. Therefore, temperature and humidity control and monitoring systems for transport and storage are necessary. In addition, medical personnel should counsel patients on proper drug storage measures.

6.0 HEAT INDEX

When Heat Index is high, humans and animals strive to lose excess body heat through perspiration. The situation is exacerbated if humidity is high or there is no breeze (i.e., the air is still). This condition could lead to heat stress. Revealing signs of heat stress include panting, increased respiration rate, persistent thirst, loss of appetite, and fatigue.

6.1 Effects of Heat Index

When the atmospheric moisture content is high, the rate of evaporation from the body decreases. The human body, therefore, feels warmer in humid conditions.

6.2 Heat Index vigilance

- High caution threshold of Heat Index is required over parts of Ogun, Anambra, and Imo state.
- Caution threshold is required in most parts of the country.
- No caution is recommended for Heat Index over parts of Kaduna, Bauchi, Plateau, and Kano states as shown in Figure 13.

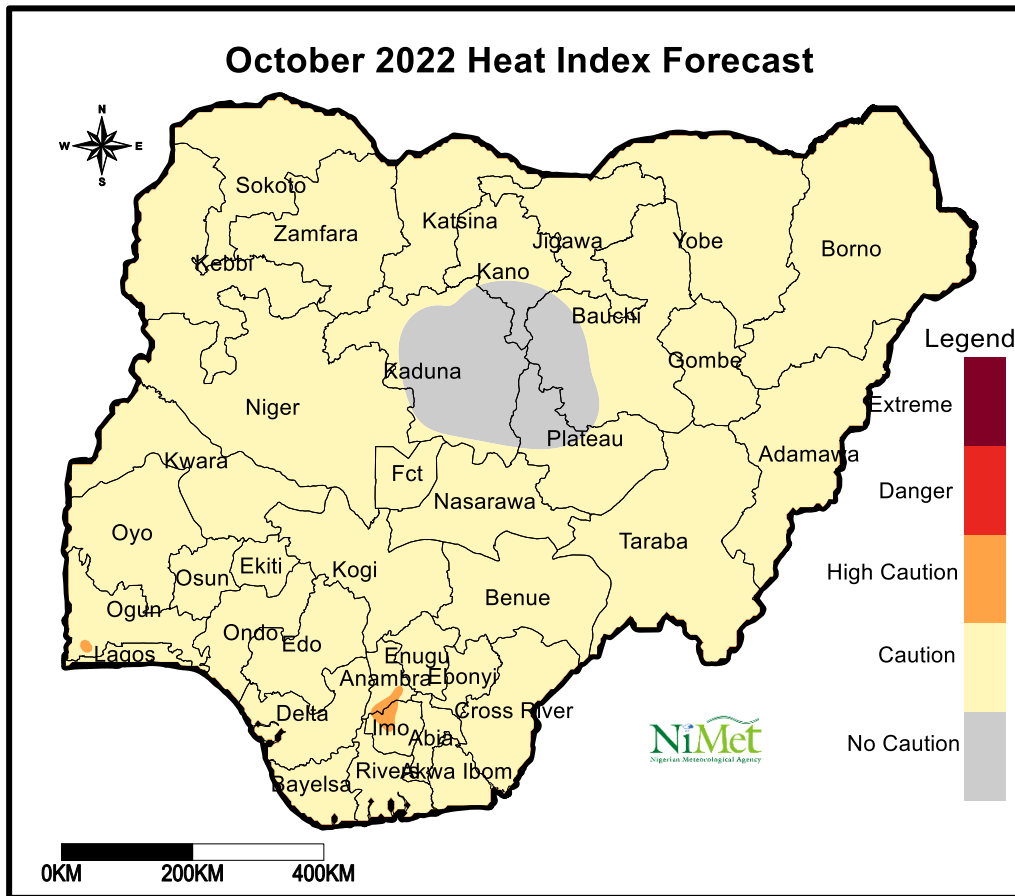


Figure 13: Heat Index vigilance map for October 2022.

6.3 Advisories

- Use shade for outdoor work sites and other activities.
- Schedule work earlier or later in the day when the weather is usually lower.
- Limit strenuous work during hot weather.
- Drink enough water or other healthy fluids frequently to keep the body hydrated.
- Wear clothing that is appropriate for hot weather.

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