African Centre of Meteorological Application for Development
Centre Africain pour les Applications de la Météorologie au Développement

CLIMATE AND HEALTH BULLETIN

N°06, June 2021



HIGHLIGHT: *Based on the above climatic conditions, high vigilance for malaria incidences is expected for the next month over the Gambia, Sierra Leone, the northern part of Gulf of Guinea countries and South Sudan, southern parts of Senegal, Niger, Chad, North Sudan, Ghana, most of Burkina Faso and Ghana as well as western Ethiopia.*

Moderate vigilance for malaria will prevail over most parts of West and Central Africa and parts of Tanzania and Mozambique.

Over 100 homes were destroyed and a cemetery submerged by flooding from a heavy downpour in Gashua town, Bade LGA, Yobe State, Nigeria, raising concerns of disease outbreak

According to the World Health Organization (WHO), 384,000 malaria deaths in the WHO African Region was recorded in 2020 (2021 data yet to be released).

According to OCHA, available data for the first quarter of the year shows that West and Central Africa has recorded fewer cholera cases and deaths in 2021 than in the last 3 years. The most affected country in the region remains the Democratic Republic of Congo with 808 cases and 35 deaths, representing respectively 87% of cases and 88% of deaths notified in the region.

1. CLIMATIC AND ENVIRONMENTAL CONDITIONS OVER AFRICA

1.1 Inter-Tropical Discontinuity (ITD)

The ITD is the demarcation line between north/north-eastern winds from the Sahara (hot, dry and dusty) and south/south-western winds and the Atlantic Ocean (cool and moist) as seen in Figure 1.

In the month of June, the ITD position was approximately 15.4^{0}N, as seen in Fig 1. When comparing the ITD position to that of May, which was around 12.9^{0}N, it indicates that the ITD was shifted northward by about 2.5^{0}N. Moisture-laden south westerly winds dominated south of the ITD. Due Ample moisture coupled with high temperatures, rainfall activities increased, making the environment favorable for breeding vectors responsible for cholera and malaria.

Figure 1: The mean position of ITD, CAB and ITCZ for the month of June 2021

1.2 Relative Humidity

The mean surface relative humidity map (Figure 2) shows that June observed high surface relative humidity above 80% over the GOG countries, Central African countries and some parts of East African countries such as the southern part of North Sudan and the western part of South Sudan.

Humidity of about 70% was observed over parts of East Africa, Mozambique and Malawi. Moderate humidity of about 60% was observed at the northern fringes of Nigeria and Burkina Fasso. It was also observed over southern Chad and parts of Central and East Africa.

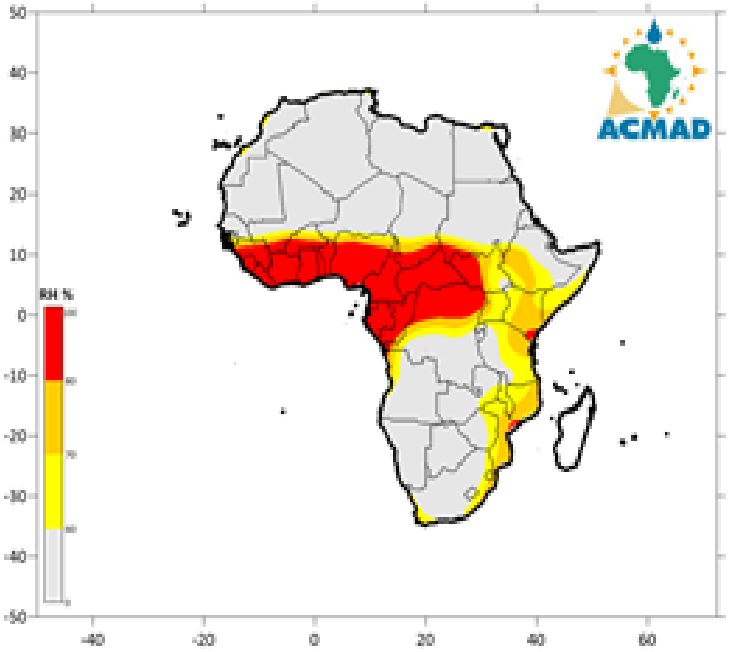


Figure 2: Surface relative humidity, June 2021
Source: NOAA/NCEP-NCAR

1.3 Air Temperature

The temperature map (Figure 3) shows that most African countries except for parts of Kenya and southern African countries experienced mean temperatures in the range of 18°C to 32°C. The exceptions observed temperatures below 18^{0}C. However, most of Mauritania, Algeria, Mali, North Sudan, parts of Niger, Chad, Senegal, Tunisia, Libya and Egypt observed temperatures greater than 32^{0}C.

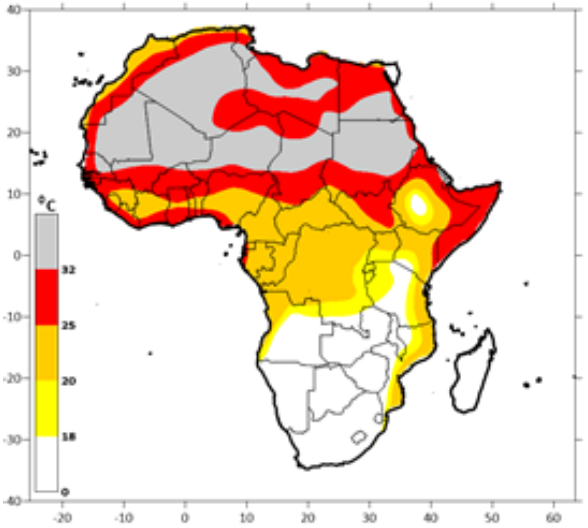


Figure 3: Mean temperature, June 2021
Source : NOAA/NCEP-NCAR

1.4 Monthly cumulative rainfall

Figure 4 shows that during June 2021, rainfall above 100mm was observed over the GOG countries, most of the central African countries, western Ethiopia, southern North Sudan and South Sudan. Rainfall less than 100mm was recorded over the southern Sahel, northern Nigeria, most of Mali and Mozambique, parts of central and east Africa, Tanzania, Malawi and South Africa. The remaining part of the continent did not record any rainfall.

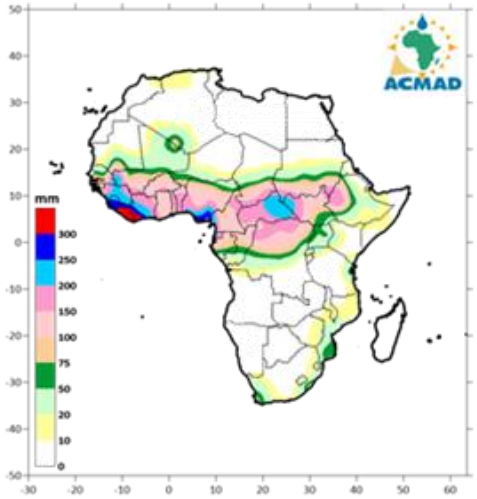


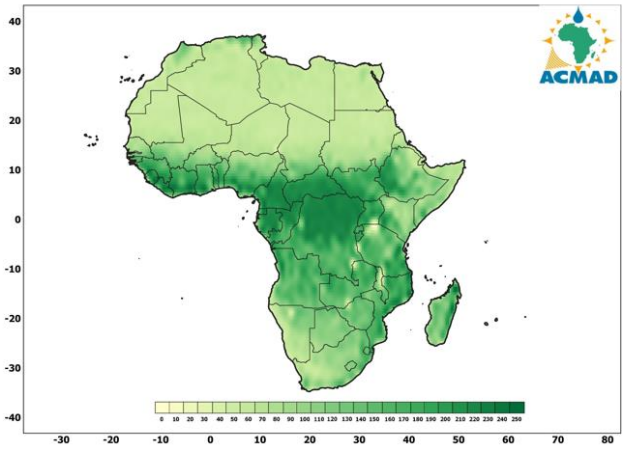
Figure 4: Monthly cumulative rainfall for June 2021
Source: NOAA/NCEP/CPC RFEv2.

5 Vegetation Index

The NDVI-MODIS images from 1 to 30 June 2021 (Figure 5) displays high vegetation cover over most parts of the southern parts of GOG countries, Central Africa, some parts of East Africa and South African countries, and Madagascar. Less vegetation cover was observed over the Sahel, North Africa, North Sudan, eastern Ethiopia, Somalia, and Djibouti, southern Namibia, South Africa and Botswana.

The breeding of mosquitoes was high in areas with thick vegetation cover, favourable for mosquito parasites and malaria as shown in the regional images below.

NDVI images: 1 to 30 June 2021



CLIMATE-RELATED DISEASES

Flooding in Chad has affected thousands of people across the regions of Tandjilé, Mandoul, Ennedi-Ouest, N'Djamena and Batha over the last few weeks. Flooding struck in south-western Tandjilé Region in late June 2021, where 5 people died and 231 were injured. Furthermore, around 4,413 houses were destroyed and over 30 educational and health buildings were severely damaged or destroyed.

3. OUTLOOK

In July, the ITD will most likely continue to move northward since the influx of more moisture is expected which will invariably lead to an increase in relative humidity. Malaria parasites and several water-borne diseases including cholera and diarrhea are likely to thrive as a result of these circumstances.

3.1 Malaria

a) Favorable conditions for the development of Malaria

The incidences of malaria and other diseases will be higher in areas with high temperatures especially in the range of 18°C to 32°C associated with high relative humidity (above 60%)/precipitation and thick vegetation cover providing conducive environmental conditions for the survival of the vector and development of the mosquitoes parasites responsible for spreading of malaria.

b) Different vigilance threshold for Malaria

T [25 - 32] °C & U [> 80%]	High vigilance
T [20 - 25] °C & U 70 - 80%]	Moderate vigilance
T [18 - 20] °C & U [60 - 70%]	Low vigilance
T <18°C & U< 60 %	No vigilance

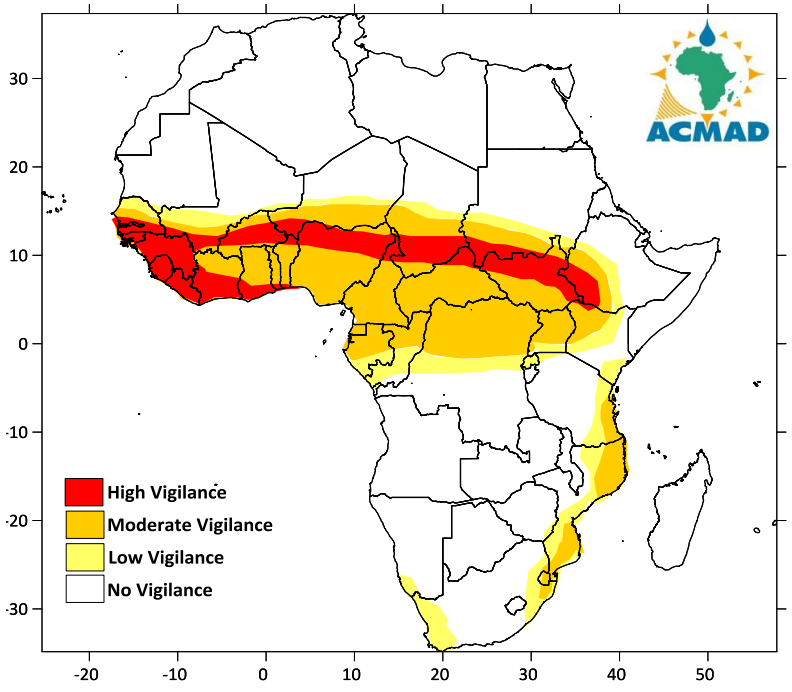


Figure 7: African Malaria Epidemic Risk Zones

Based on the above climatic conditions as shown in fig. 7, high vigilance for malaria incidences is expected for the next month over Gambia, Sierra Leone, the northern part of Gulf of Guinea countries and South Sudan, southern parts of Senegal, Niger, Chad, North Sudan, Ghana, most of Burkina Faso and Ghana as well as western Ethiopia. Moderate vigilance for malaria will prevail over most parts of West and Central Africa and parts of Tanzania and Mozambique. However, low vigilance for malaria is expected over southern Gabon, Congo, Mali, central Chad, Niger, and parts of Mozambique, Tanzania and South Africa.

3.2 Cholera

The climatic and environmental conditions of countries that observed precipitations above normal shown in figure 7 of the monthly climatic bulletin of June 2021 should undergo efficient surveillance to guard against the spreading of cholera outbreaks and other water-borne diseases. The rise of rivers due to heavy rains will expose several people to the epidemic risk.

In 2021, a cumulative total of 2761 suspected cholera cases, with 24 deaths (a case fatality ratio (CFR) of 0.9%) was reported. All suspected cholera cases were recorded in 22 districts in the Hirshabelle, South West, and Banadir regions. A total attack rate of 79 persons per 100 000 persons was observed in 2021. Adale (554 per 100,000 people), Danyile (519 per 100,000 people), and Madina had the highest attack rates (233 per 100 000 population). Banadir has recorded the majority of the deaths.

The cholera outbreak began in December 2017 as a result of floods that hit regions in the Jubba and Shabelle river basins. It was contained in five of the six regions, while active transmission from Banadir was still being recorded. Every year, heavy Gu rains generate recurrent flash floods in early summer, contaminating water supplies and resulting in a rise in the number of cholera cases.