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**Relevance**

Influenza, commonly known as «the flu», is an infectious disease caused by an influenza virus [1]. Three of the four types of influenza viruses affect people, Type A, Type B, and Type C. Type D has not been known to infect people, but has the potential to. Usually, the virus is spread through the air from coughs or sneezes. This is believed to occur mostly over relatively short distances. It can also be spread by touching surfaces contaminated by the virus and then touching the mouth or eyes. Yearly vaccinations against influenza are recommended by the World Health Organization for those at high risk. [1] A vaccine made for one year may not be useful in the following year, since the virus evolves rapidly. Influenza spreads around the world in a yearly outbreak, resulting in about three to five million cases of severe illness and about 250,000 to 500,000 deaths. About 20 % of unvaccinated children and 10 % of unvaccinated adults are infected each year. In the Northern and Southern parts of the world, outbreaks occur mainly in winter while in areas around the equator outbreaks may occur at any time of the year [2]. However, seasonal changes in infection rates also occur in tropical regions, and in some countries these peaks of infection are seen mainly during the rainy season. Seasonal changes in contact rates from school terms, which are a major factor in other childhood diseases such as measles and pertussis, may also play a role in the flu. The weather in Africa is diverse; in the northern hemisphere, weather is generally determined according to four seasons: spring, summer, fall and winter. In many African countries, however, there are only two distinct seasons: the rainy season and the dry season (with the heat in dry season sometimes exceeding 40 degrees [2]).

Africa has five main regions; North Africa (6 countries): Egypt, Libya, Tunisia, Algeria, Morocco and Western Sahara. West Africa (18 countries): Benin, Burkina Faso, Cameroon, Cape Verde, Chad, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, and Togo. Central Africa (6 countries): Central African Republic, Congo, Democratic Republic of Congo, Equatorial Guinea, Gabon, and São Tomé and Príncipe. East Africa (14 countries): made up by the countries in the Horn (Eritrea, Ethiopia, Somalia, Djibouti), plus Sudan, Uganda, Kenya, Tanzania, Rwanda, Burundi and plus the islands (The Comoros, Mauritius, the Seychelles and Madagascar). Southern Africa (10 countries): Angola, Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Zambia and Zimbabwe [4].

**Purpose of the study**

The purpose of this study is to review and determine the epidemiology of influenza in Africa and also highlight ways to prevent or manage peak during outbreaks.

**Materials and research methods**

Reviews, analysis, data processing of domestic and foreign literature on influenza virus outbreaks and the extent of their occurrence.

**Results and discussion**

In a systematic review done by Gessner BD, et al in 2011 [6] on the epidemiology seasonal influenza in sub-Saharan Africa, there is a moderate amount of data on influenza seasonality, particularly in southern Africa where winter seasonality is similar to that in North America and Europe. In Zambia, South Africa, and to a large extent, Madagascar, seasonal influenza occurrence corresponded with the drier, cooler winter months of June to August. Of the few countries nearer the equator with published data, influenza seasonality was less pronounced. For example, there was influenza activity during all seasons in Senegal; while average monthly temperatures in Senegal are relatively consistent at 27–32 °C, rainfall varies substantially from an average monthly peak of 250 mm

between July and September to about 0 mm during November to May. If seasonality is minimal or absent in some areas of Africa, identification of influenza burden is difficult, because one method of establishing the overall burden in temperate climates is to model changes in clinical outcomes (such as mortality or admission to hospital for pneumonia) by changes in influenza virus identification rates. Additionally, identification of seasonality in the many climatic zones extending across Africa will be essential to planning the timing of public health interventions, such as vaccination.

An analysis of WHO FluNet influenza surveillance data between 2011–2016 [3] showed that in the African Region (AFR), 22 (47 %) of 47 countries reported influenza surveillance data to WHO FluNet between 2011 and 2016. The average influenza peak was usually about 6 months long. This region was the only region with countries characterized as having all three types of influenza patterns: year-round influenza activity in four countries (18 %), one influenza peak in 13 countries (59 %), and two influenza peaks in five countries (23 %). Influenza activity in the northern African Region countries was generally similar to temperate northern hemisphere patterns, while activity in the southern AFR countries exhibited influenza patterns more indicative of southern hemisphere activity. Influenza activity varied in tropical countries. For instance, Senegal had one influenza peak between August and November; Mali had two influenza peaks in February through April and in September through October; and Nigeria had year-round influenza activity. In eastern Africa, Kenya had year-round influenza activity, and Tanzania had two influenza peaks in November through January and April through June. Influenza seasonality was well defined in South Africa, which reported activity from May through September, similar to other temperate southern hemisphere countries.

In another study, «Epidemiology of influenza in West Africa after the 2009 influenza A(H1N1) pandemic, 2010–2012», [5] based on the result gotten from the study in about 8 countries (Nigeria, Togo, Cote d'Ivoire, Niger, Mali, Sierre Leone, Mauritania and Burkina Faso), influenza appeared to circulate year round in West Africa with its most occurrence during dry season also known as harmattan (January-March) and during rainy season (August-November). The result of the study also showed the various strains of influenza dominant in some of these countries; influenza A(H1N1) actively circulated in Cote d'Ivoire, Niger, Togo and Nigeria while strains A(1N1) and influenza B viruses were predominant in Cote d'Ivoire and Burkina Faso. The major strains of influenza viruses in these 8 countries were A(H1N1), A(H3N2) and influenza B.

An overview on influenza virus infections in Kenya by Duncan Mwangangi, et al 2013 [7] showed that several trends were observed: influenza circulates throughout the year with two peaks; the major one from September to November and a minor one from March to June. The predominant strains of influenza varied over the years: Seasonal Influenza A(H3N2) virus was predominant from 2008 to 2009 and from 2012 to 2014; Influenza A(H1N1) was dominant in 2010; and Influenza B virus was dominant in 2011. The times the influenza cases were more generally coincided with times of higher humidity, lower temperature, and higher rainfall. Influenza circulated throughout the year in Uganda with two major peaks of outbreaks with similar strains circulating elsewhere in the region. Data on the circulating strains of influenza and its patterns of occurrence provided critical insights to informing the design and timing of influenza vaccines for influenza prevention in tropical regions of sub-Saharan Africa.

### **Conclusion**

Influenza is a major cause of sickness and death worldwide. One of the reasons why it is usually difficult to prevent or manage outbreaks is because influenza vaccines and antiviral drugs are usually not available in some countries. Some other countries, especially the ones in North Africa do not have any data concerning management of influenza and so it is very difficult to prevent and manage any outbreak. The African Network for Influenza Surveillance and Epidemiology (ANISE) founded in 2009 has been working on improving the detection, case management, control and prevention of influenza and other respiratory viruses in Africa.

### **BIBLIOGRAPHY.**

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