**Epidemic Thresholds**

Thresholds are calculated using Moving Epidemic Methods (MEM), a sequential analysis using R language available from: http://CRAN.R-project.org/web/package=mem) designed to calculate the duration, start and end of the annual influenza epidemic. MEM uses the 40th, 90th and 97.5th percentile established from available years of historical data to calculate threshold activities. Threshold activity for influenza is categorized as follows: below epidemic threshold, low, moderate, high and very high. Transmissibility of influenza can be inferred from ILI data while SARI data gives an indication of severity.

**Comments**

The 2019 season started in between weeks 4-18 (4th - 1st week of January/May), when the rates of Influenza-Like Illness (ILI) and Severe Acute Respiratory Infection (SARI) attributable to influenza virus infection was within the low seasonal threshold. The epidemic threshold rose from low to within moderate transmissibility in week 13 -14 and maintained the low severity until week 18 (1th week of May). There appear to be experiencing the first cycle of activity which is currently in the below the threshold in week 21.
ILI Surveillance:
30th June 2019, week 25. Specimens from 430 outpatients were received from two ILI surveillance sites. 416 (97%) were adequately sampled and tested. Influenza virus was detected in 37 of these samples; 27 were identified as Influenza B, 3 Influenza A H3N2, 3 Influenza A H1N1 and 4 as Influenza A Unsubtypable.

SARI Surveillance:
During this same period, specimens were received from 820 patients admitted to four SARI surveillance sites. 572 (70%) were adequately sampled and tested. Influenza was detected in 23 specimens; 18 of which were identified as Influenza B, 1 as Influenza A H3N2, 1 as Influenza A H1N1 and 3 as Influenza A Unsubtypable.

30th June 2019: Influenza Transmissibility
Fig 1: Out-Patient Clinic Visit Surveillance1 - (ILI Surveillance) for Influenza Detection and Epidemic Thresholds

From May - June 30th 2019, ILI outpatient visits attributable to influenza virus infection from weeks 23-26 fell below epidemic levels of transmissibility throughout the month. As a result, we are currently experiencing low confirmed influenza detection.
30th June 2019: Influenza Severity (Impact)

Fig 2: Hospital Admission Surveillance1 - (SARI Surveillance) for Influenza Detection and Epidemic Thresholds *

May – June 30th 2019, SARI admissions attributable to influenza virus infection from weeks 23 -26, fell below epidemic threshold for high severity.

1SARI Case / Total Admission Sampled *100
*Threshold based on 2013 - 2018
Fig 3: Positives samples* by influenza types and detection rate by weeks in 2019.

*Specimens from patients with influenza-like illness at two (2) sentinel sites and three (3) sentinel sites for admitted patients from week 1 - 25. The 2019 influenza season is currently characterized by a high spread of seasonal influenza and random detection of flu A, A H1N1 and subtypes A H3N2 in weeks, 1 - 17. A high number of seasonal influenza was detected between weeks 7-18 from all sentinel sites.

A high number of seasonal and pandemic A influenza detections was in the age group between 1 - 4 years.
**Cumulative Number of Identified Influenza Types and Subtypes and Total Number of Samples Collected by Case and Hospital/Clinic**

<table>
<thead>
<tr>
<th>Case</th>
<th>B</th>
<th>A (Not typed)</th>
<th>AH1N1 (Seasonal)</th>
<th>AH1N1 (Pandemic)</th>
<th>A H3N2</th>
<th>A H5N1</th>
<th>Total Samples Tested</th>
</tr>
</thead>
<tbody>
<tr>
<td>ILI</td>
<td>26</td>
<td>4</td>
<td>0</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>416</td>
</tr>
<tr>
<td>SAR</td>
<td>18</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>572</td>
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<tr>
<td>Unknown</td>
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<td>2</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>212</td>
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<tr>
<td><strong>Total</strong></td>
<td>61</td>
<td>9</td>
<td>0</td>
<td>8</td>
<td>4</td>
<td>0</td>
<td><strong>1200</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>District</th>
<th>Hospital/Clinic</th>
<th>B</th>
<th>A (Not typed)</th>
<th>AH1N1 (Seasonal)</th>
<th>AH1N1 (Pandemic)</th>
<th>A H3N2</th>
<th>A H5N1</th>
<th>Total Samples Tested</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lusaka</td>
<td>UTH Fihar</td>
<td>4</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>223</td>
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<tr>
<td></td>
<td>UTH Pedistro</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>159</td>
</tr>
<tr>
<td></td>
<td>Chicaula Clinic</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>176</td>
</tr>
<tr>
<td>Ndola</td>
<td>Ndo a Contra</td>
<td>12</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>242</td>
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<tr>
<td></td>
<td>Arthur Davidson</td>
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<td>2</td>
<td>0</td>
<td>5</td>
<td>1</td>
<td>0</td>
<td>146</td>
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<td>Nov Masaala</td>
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<td>0</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>254</td>
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<tr>
<td><strong>Others</strong></td>
<td>Other Hospital/Clinic</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>61</td>
<td>9</td>
<td>0</td>
<td>8</td>
<td>4</td>
<td>0</td>
<td><strong>1200</strong></td>
</tr>
</tbody>
</table>

The total samples collected as at 30th June 2019, are 1301; 1196 (92%) have been tested. 82 (7%) are positive for influenza virus and 1114 (93%) negatives. Two (4) samples were rejected.