Event Based Surveillance in Nigeria
Use of Tatafo for mining signals

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13th November, 2019
Nigeria Centre for Disease Control (NCDC)

**Mandate**

Prevent, detect, and control spread of communicable diseases

**Coordinate** surveillance systems to collect, analyse and interpret data on communicable diseases to guide action

**Support States** in responding to small outbreaks, and lead response to large disease outbreaks

Develop and maintain a network of public health laboratories

Conduct, collate, synthesise and disseminate public health research to inform policy

**Coordinate** the compliance with international health regulations
Areas of our work

INCLUDING EI0S, Tatafo, SITAware, Connect Centre, SORMAS

NCDC

Incident Coordination Centre
Digital Surveillance
External Communications
Laboratory Network
Networked State PHEOCs
### Event Based Surveillance Milestones

<table>
<thead>
<tr>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCDC EBS Unit established</td>
<td>EBS included in NCDC 2017-2021 Strategic Plan</td>
<td>Digital Surveillance Workshop with PHE</td>
<td>SITAware Updated</td>
</tr>
<tr>
<td>University of Maryland</td>
<td>‘Goal B2: Strengthen the early warning / horizon scanning alert system’</td>
<td>EBS evaluation</td>
<td>EBS training with CDC</td>
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<tr>
<td>Baltimore (UMB)</td>
<td>Draft national guidelines</td>
<td>SITAware Developed</td>
<td>EIOS training with WHO</td>
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<tr>
<td>Three receptors enabled</td>
<td>JEE Score = 39%</td>
<td>SOPs Developed</td>
<td>Updated Organogram + Team expansion</td>
</tr>
<tr>
<td>TATAFO software, Connect centre Moderated search</td>
<td></td>
<td>Updated reporting templates</td>
<td></td>
</tr>
</tbody>
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National Guidelines on Integrated Disease Surveillance and Response (IDSR) Strategy
Systems in use

**Bio-surveillance information systems**

- **Tatafo & EIOS**
  - Tracking twitter conversations

- **Twitter Deck**
  - Dashboard - tracking twitter conversations

**Hotline**

- Publicly available toll-free number

**SITAware**

- Platform for documenting and managing signals & events

**SMS & WhatsApp**

- Publicly available number dedicated to receiving messages

**Sugar CRM**

- Logging queries for inbound and outbound calls & messages
Standards in Place

- SOPs
- Draft National EBS guideline
- Template for daily reporting
- Template for logging signals/events
- Modified workflow
Tatafo
What was the need to be addressed?

• Early identification of public health threats

• One-stop-shop for media monitoring

• Identifying areas where there is need for intervention
Tatafo: System Description

• Initially rolled out in 2016 by UMB with funding from US CDC
• Tatafo means “Gossip” in one of the local languages
• A data mining tool, uses;
  • Text mining, analysis and natural language processing
• Retrieves hits from over 1,250 media sites
  • Categorized into online TV, radio, blogs, magazines and online health sites
  • Data filtered into the newsfeed, usually auto-update every 15 minutes
• Retrieves trending information via configured keywords used at site searches.
  • Key words coined from 41 notifiable diseases including street words that connote
diseases, deaths or health conditions/events
### Tatafo raw data: snapshot

**Tatafo**

[Bio surveillance information system](#)

<table>
<thead>
<tr>
<th>Published</th>
<th>Topic</th>
<th>Text</th>
<th>Source</th>
<th>Score</th>
<th>Rating</th>
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<tbody>
<tr>
<td>2019-11-01</td>
<td>vaccine</td>
<td>I wish I didn’t have to go anywhere today. I feel so sick enaww! Now I’m gonna get my vaccine shots today again, i...</td>
<td>twitter: @lamisno1</td>
<td>38</td>
<td></td>
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<tr>
<td>2019-11-01</td>
<td>tuberculosis</td>
<td>Oxidative stress biomarkers in pulmonary tuberculosis patients in Gombe, North-eastern Nigeria. <a href="https://co">https://co</a>...</td>
<td>twitter: @eun732003</td>
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<tr>
<td>2019-10-31</td>
<td>sexual</td>
<td>sexual transmitted disease</td>
<td>twitter: @DrZobo</td>
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<td></td>
<td>transmitted</td>
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<td></td>
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<tr>
<td></td>
<td>disease</td>
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<td>2019-10-31</td>
<td>polio</td>
<td>our peoples need awareness Pakistan is one of the remaining polio endemic countries in the world, along with A...</td>
<td>twitter: @ak_652</td>
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<tr>
<td>2019-10-31</td>
<td>plague</td>
<td>@ogaldeogunmg: That overhead bridge is the biggest scam sold to Ogun State people. That man raised public fun...</td>
<td>twitter: @TomiOdobaran</td>
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<tr>
<td>2019-10-31</td>
<td>vaccine</td>
<td>Examining the effect of Vaccine Direct Delivery (VDD) on Vaccine stockouts and vaccination cases prevalent in...</td>
<td>twitter: @immeconomics</td>
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<td></td>
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<tr>
<td>2019-10-31</td>
<td>snake bite</td>
<td>@villagecomment: The things we go thru in this country is unthinkable. The school couldn’t provide light...</td>
<td>twitter: @Joshua17707</td>
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<td></td>
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<tr>
<td>2019-10-31</td>
<td>vaccine</td>
<td>How is measles disease prevented? Vaccination with measles vaccine is the only preventive method, it is safe an...</td>
<td>twitter: @MAsamuelUmar</td>
<td>289</td>
<td></td>
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<tr>
<td>2019-10-31</td>
<td>outbreak</td>
<td>#Nigeria, suspected yellowfever outbreak killed at least 24 people (CNES). <a href="https://t.co/6KV1Kg9">https://t.co/6KV1Kg9</a></td>
<td>twitter: @igorenhopper</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>
Tatafo: System Description

- Articles/tweets are ranked based on:
  - Relevance to disease of public health interest
  - Ranked in 4 categories;

- Data can be exported from particular time/date to another to compare information and for analysis

- Overtime, a time graph can be plotted to display trend of conditions on daily, weekly, monthly and yearly basis

- Data is displayed graphically and geo-located on maps
Tatafo output: snapshot

Key uses

- Document events of interest
- Contribute to Epidemiologic summary reports
- Escalation of signals for verification
How has the tool contributed to disease surveillance and guided public health action?

Captured over 80,000 signals since deployment in Nov 2016.

- 570 identified related signals for follow up
- 220 verified true

- 41 priority diseases and events are captured by tatafo and this includes Lassa fever, Monkey pox, Meningitis, Yellow fever, Polio, Cholera, HIV/AIDS and Ebola

- Country-wide coverage of data mining processes.
  - Top locations for most hits-Borno, Lagos, Edo, Zamfara, Abuja, Benue, Rivers and Sokoto
Achievements

• **Institutional Support:**
  - Dedicated EBS Unit, Increased number of staff
  - New staff trained on EBS principles & practices
  - SOPs developed

• **Strong Partner support**
  - Functional relationship with WHO, CDC and PHE

• **Introduction of new tools**
  - Introduction to EIOS
  - Nigeria 1st country in Africa to roll out EIOS at country level

• **Integration with existing systems**
  - Integrated into the IDSR reporting system as information from the community
Broad EBS Challenges

• Significant noise from the system

• Some staff/activities heavily dependent on partner funding

• Delays in signal verification

• Sub optimal adherence to SoPs
Way forward

• Improving the specificity of our EBS tools

• Decentralisation/roll out to sub national level

• Implement learnings from recent EBS trainings (from US CDC & WHO EIROS)

• Opportunities for regional collaboration
  • Information sharing & Capacity building e.g. Africa CDC, WAHO, ECDC
Acknowledgement

• State officials

• Partners
  • Public Health England
  • WHO (all 3 levels)
  • US CDC
  • University of Maryland Baltimore (UMB)
  • George town University
Thank you

Nigeria Centre for Disease Control

A healthier and safer Nigeria through the prevention and control of diseases of public health importance