



# Nigeria Centre for Disease Control

Protecting the health of Nigerians

## Event Based Surveillance in Nigeria

### Use of Tatafo for mining signals

---

**Dr Muntari Hassan**

Lead- Event Based Surveillance Unit of NCDC

13<sup>th</sup> 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 EIOS,  
Tatafo, SITAware,  
Connect Centre,  
SORMAS



Incident  
Coordination  
Centre

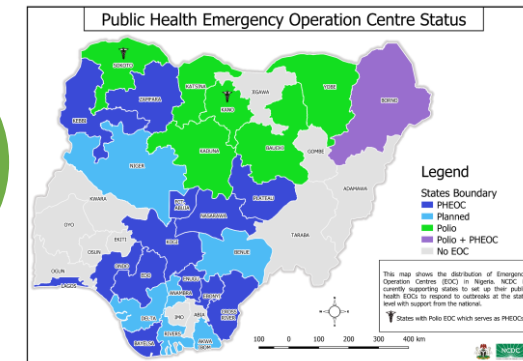
Digital  
Surveillance

Networked  
State  
PHEOCs

NCDC

External  
Communicatio  
ns

Laboratory  
Network



# Event Based Surveillance Milestones



2016

- **NCDC EBS Unit established** mainly in partnership with University of Maryland Baltimore(UMB)
- **Three receptors enabled**  
TATAFO software,  
Connect centre  
Moderated search

2017

- EBS included in NCDC 2017-2021 Strategic Plan
- 'Goal B2: Strengthen the early warning / horizon scanning alert system'
- Draft national guidelines
- JEE Score =39%

2018

- Digital Surveillance Workshop with PHE
- EBS evaluation
- SITAware Developed
- SOPs Developed
- Updated reporting templates

2019

- SITAware Updated
- EBS training with CDC
- EIOS training with WHO
- Updated Organogram + Team expansion

National Guidelines on Integrated Disease Surveillance and Response (IDSR) Strategy



# Systems in use



NIGERIA CENTRE FOR DISEASE CONTROL

## Tatafo & EIOS

Bio-surveillance information systems

Ta-fo

Dashboard

Map

Raw Data

Ranked Data

Export Data

Top Sources

Config

Published Topic Text Source Score Rating

2018-03-15	lassa	Here is how WHO and partners are fighting #LassaFever in #Nigeria	twitter	872,007	+2
17:04:21	fever	77 https://t.co/guZuCuVd https://t.co/0HqGCaJyB	@WHO		
2018-03-15	lassa	@WorldBank confirms #Nigeria's Lassa fever outbreak qualifies as 'eligible event' under pandemic emergency financing. https://t.co/KV5K5aYm	@EpiAlert	11,744	+2
07:15:27	fever	"We are preparing for the worst." Long overlooked, #Lassa is starting to get global attention amid Nigeria outbreak. https://t.co/0HqGCaJyB	@DavidBelt	7,109	+1
2018-03-15	lassa	Deadly Lassa fever outbreak tests Nigeria's revamped health agency - https://t.co/0HqGCaJyB	twitter	4,771	+1
17:32:53	fever	Deadly Lassa fever outbreak tests Nigeria's revamped health agency - https://t.co/0HqGCaJyB	@HealthyWld	3,069	+1
2018-03-15	lassa	Deadly Lassa fever outbreak tests Nigeria's revamped health agency - https://t.co/0HqGCaJyB	@Healthy_Wld	864	+1
17:37:19	lassa	The federal government has stated that there are no charges for Lassa fever drugs and treatment agents Nigeria - https://t.co/0HqGCaJyB	@ewangpham	830	+1
2018-03-15	lassa	"We must carefully consider how we transition many of the polio workers and the polio infrastructure to help with m. https://t.co/0HqGCaJyB	twitter	652	+1
08:05:32	fever	Deadly Lassa fever outbreak tests Nigeria's revamped health agency - https://t.co/0HqGCaJyB	@BermanInstitute	602	+1
2018-03-15	lassa	Deadly Lassa fever outbreak tests Nigeria's revamped health agency - https://t.co/0HqGCaJyB	@WordNature	452	+1
2018-03-15	lassa	Climate change and urbanisation are making the latest outbreak of Lassa in Nigeria the worst yet https://t.co/0HqGCaJyB	@CEPvacines	423	
2018-03-15	lassa	#Kenya: Nigeria tries to contain deadly Lassa Fever outbreak https://t.co/0HqGCaJyB	twitter	411	+1
09:05:26	fever	Deadly Lassa fever outbreak tests Nigeria's revamped health agency - Deadly Lassa fever outbreak - https://t.co/0HqGCaJyB	@Health_News_UJ	280	
17:46:55	lassa	Lassa Fever: Everything You Need To Know Right Now - #LassaFever	@LJNigeria	219	
2018-03-15	lassa	https://t.co/0HqGCaJyB Federal Govt of Nigeria has ensured that Ribavirin, the major drug used for the treatment o. https://t.co/0HqGCaJyB	@EpiAlert	159	+1
08:37:26	fever	WHO deploys personnel to contain Lassa fever outbreak in Nigeria - The Eagle Online	@EagleOnline		
2018-03-15	lassa	https://t.co/0HqGCaJyB			
22:21:47	fever	https://t.co/0HqGCaJyB			

## Hotline

Publicly available toll-free number



## SITAware

Platform for documenting and managing signals & events

SITAware

Incident and Outbreak Logging

NCDC

home Dashboard Reports Admin

Suspected Disease: Cholera Affected State: Any State Incidents which started from: 08/05/2018

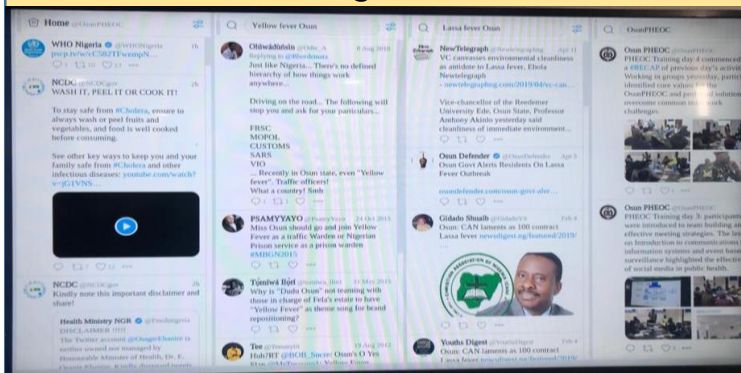
Search

Open Cholera Incidents (onset between 08/05/2018 and 08/11/2018)

First Reported State	Disease	Start Date	Incidents	Population in LGA	Suspected	Labs confirmed	Total Cases	Deaths	First Onset	Last Onset
Borno	Cholera	08/05/2018	50208	69920	0	0	0	0	08/05/2018	N/A
Abia	Cholera	22/09/2018	50207	19	40	0	47	0	22/09/2018	N/A
Cross River	Cholera	18/04/2018	50203	212971	232	1	233	0	18/04/2018	N/A
Bauchi	Cholera	29/04/2018	50201	0	60	0	60	0	29/04/2018	N/A
Niger	Cholera	03/05/2018	50208	703452	134	2	136	0	03/05/2018	N/A
Ogun	Cholera	03/05/2018	50208	0	438	10	448	0	03/05/2018	N/A
Oyo	Cholera	08/05/2018	50202	179443	250	2	252	0	08/05/2018	N/A
Sokoto	Cholera	06/05/2018	50203	111729	70	0	70	0	06/05/2018	N/A
Wyo	Cholera	13/05/2018	50204	20523	296	0	296	0	13/05/2018	N/A
Grand Total			8	4688154	1484	25	1509	154		

## Twitter Deck

Dashboard -tracking twitter conversations



## SMS & WhatsApp

Publicly available number dedicated to receiving messages



## Sugar CRM

Logging queries for inbound and outbound calls & messages



# Standards in Place



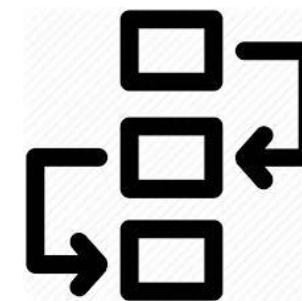
SOPs

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 15minutes
- 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

Ta-ta-fo

Bio-surveillance information system

Hi Guest 1,

[Log out](#)

Dashboard						
Map						
Raw Data						
Ranked Data						
Export Data						
Top Sources						

Published	Topic	Text	Source	Score	Rating	..
2019-11-01 08:44:45	vaccine	I wish I didn't have to go anywhere today. I feel so sick ewwww ! Now I'm gonna get my vaccine shots today again, i... <a href="https://t.co/DyccLGyi9l">https://t.co/DyccLGyi9l</a>	twitter <a href="#">@_iam_no1</a>	38	-	
2019-11-01 04:32:24	tuberculosis	Oxidative stress biomarkers in pulmonary tuberculosis patients in Gombe, North-eastern Nigeria- <a href="https://t.co/8PouSR2M8k">https://t.co/8PouSR2M8k</a>	twitter <a href="#">@arun732003</a>	17	-	
2019-10-31 18:33:52	sexual transmitted disease	@bigmoNaija @projectpinkblue @ACTFoundation_ @aproko_doctor @DrZSB @MedicaidCF @ekemma @renoomokri @9jafinestchic... <a href="https://t.co/98m1YgLizx">https://t.co/98m1YgLizx</a>	twitter <a href="#">@DrZobo</a>	2,754	-	
2019-10-31 15:25:19	polio	our peoples need awareness Pakistan is one of three remainingpolio-endemic countries in the world, along with Afgha... <a href="https://t.co/kTLrV7te6Z">https://t.co/kTLrV7te6Z</a>	twitter <a href="#">@ak_652</a>	1	-	
2019-10-31 13:52:36	plague	@oladapo_engr That overhead bridge is the biggest scam sold to Ogun State people. That man wasted public funds more... <a href="https://t.co/REmAM5wUbb">https://t.co/REmAM5wUbb</a>	twitter <a href="#">@TosinOdetoran</a>	9	-	
2019-10-31 10:30:20	vaccine	Examining the effect of Vaccine Direct Delivery (VDD) on #vaccine stockouts and #vaccination cases prevalent in... <a href="https://t.co/R00jhUNqS4">https://t.co/R00jhUNqS4</a>	twitter <a href="#">@immeconomics</a>	17	-	
2019-10-31 10:22:53	snake bite	@villagewomenija @UDUSOK The things we go tru in this country is unthinkable.... The school couldn't provide light... <a href="https://t.co/fHy29Up6Th">https://t.co/fHy29Up6Th</a>	twitter <a href="#">@Joshua17767</a>	30	-	
2019-10-31 09:53:26	vaccine	How is measles disease prevented? Vaccination with measles vaccine is the only preventive method , it is safe and e... <a href="https://t.co/Lwp34VLKo9">https://t.co/Lwp34VLKo9</a>	twitter <a href="#">@MsJameelaUmar</a>	289	-	
2019-10-31 08:49:28	outbreak	#Nigeria, suspected #Yellowfever #outbreak killed at least 24 people (CNEB) <a href="https://t.co/uKQi7i2MY8">https://t.co/uKQi7i2MY8</a>	twitter <a href="#">@ironorehopper</a>	6	-	

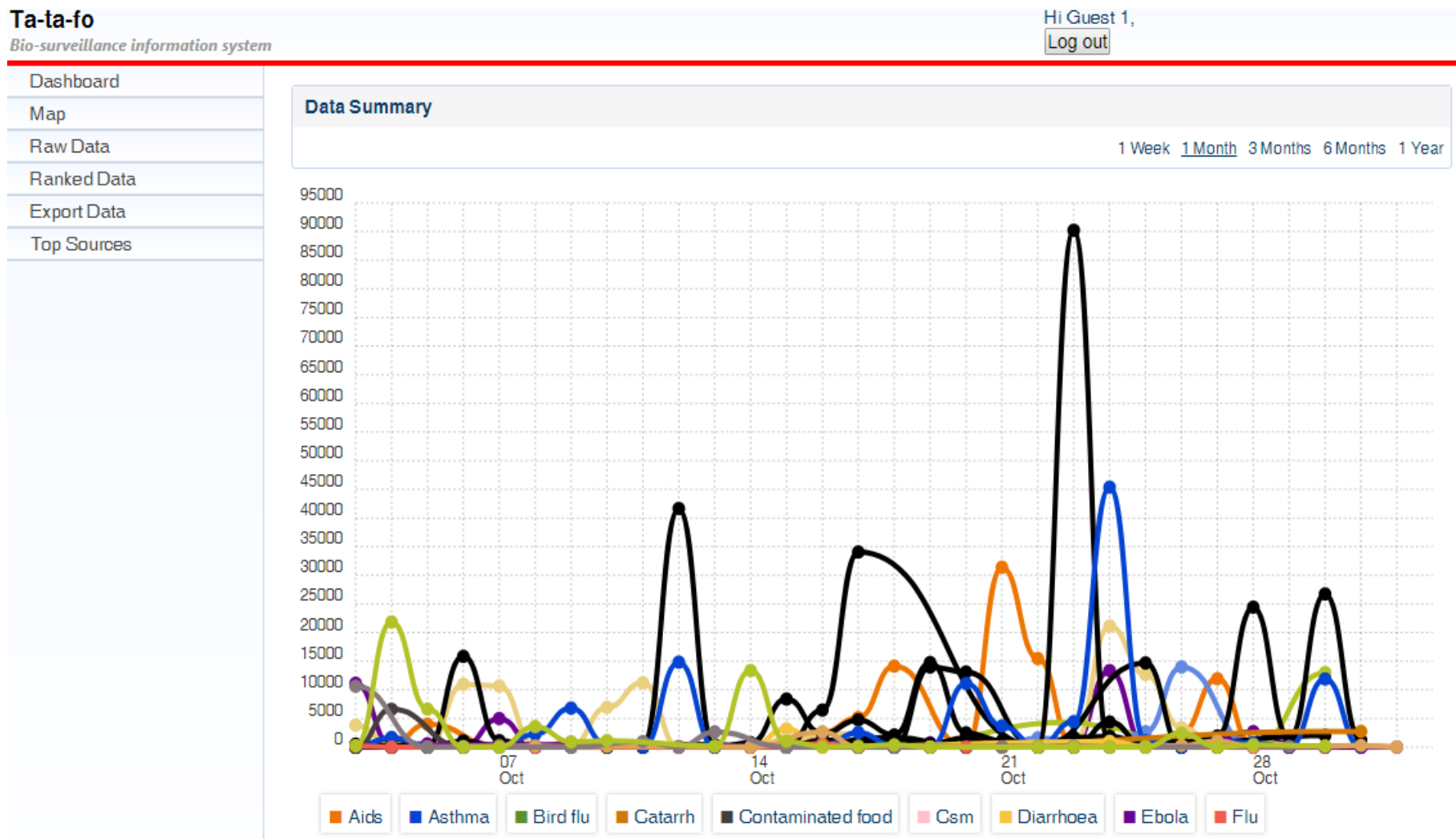


# Tatafo: System Description

- 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 1<sup>st</sup> 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 EIOS)
- 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**