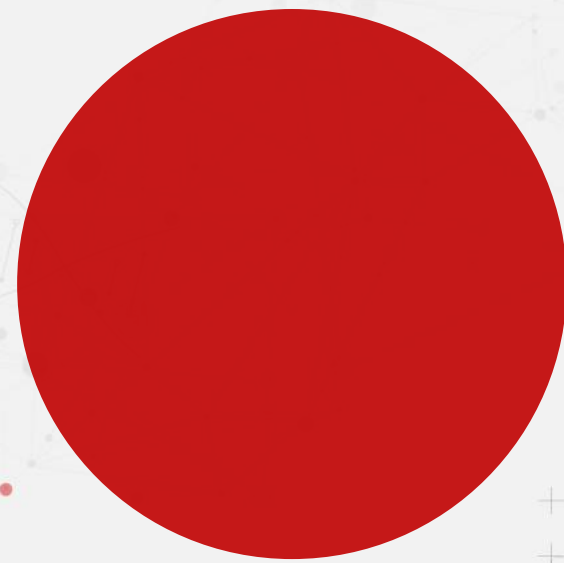


birlasoft

Generative AI

**Protecting Life and Livelihood
through Biosurveillance**

May 30, 2024



SPREADS GERMS OF DEATH.



**Woman Who Is a Living Culture
Typhoid Fever Bacilli.**

**Carrier of Disease, Blamed for
51 Cases and 3 Deaths, but
She Was Held Immune**

**Woman Isolated on North Brother Island in
Court on Habeas Corpus.**

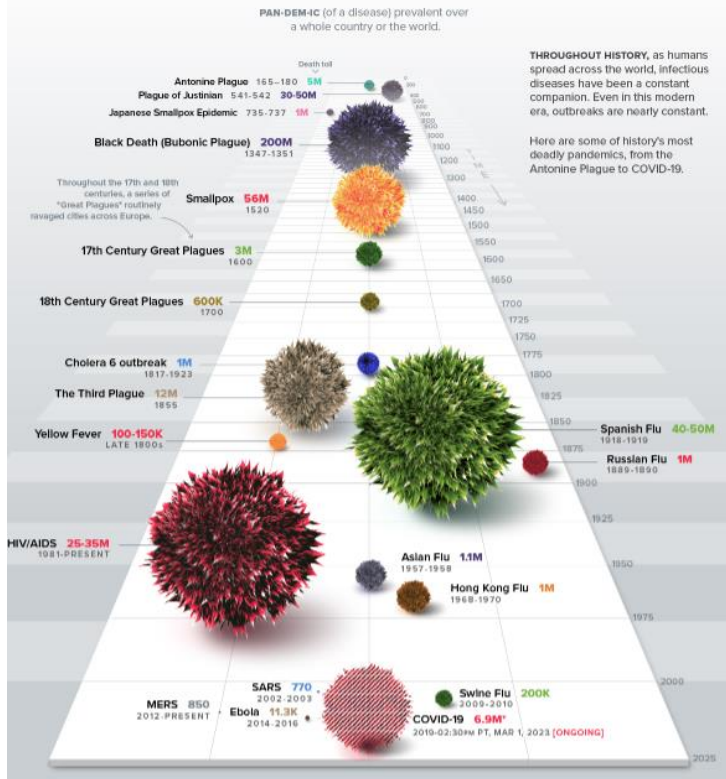
**Blamed for Twenty-five Cases of
Fever Among Doctors and Nurses
—Now In Quarantine.**

Mary Mallon

COVID-19 Won't be the Last Pandemic...

...but we have the capability to make it the Last Worst Pandemic

HISTORY OF PANDEMICS



[DEATH TOLL AS A PERCENT OF THE POPULATION]

Pandemic	% of Population	Death toll	Population Est.	Year of Est.
Black Death	51.0%	200M	0.39B	1300
Plague of Justinian	19.1%	40M	0.21B	500
Smallpox	12.1%	56M	0.46B	1500
Antonine Plague	2.6%	5M	0.20B	200
Spanish Flu	2.5%	45M	1.82B	1919
The Third Plague	1.0%	12M	1.26B	1850
HIV/AIDS	0.7%	30M	4.46B	1981
COVID-19	0.09%	6.9M	8.00B	03/01/2023

A Brief History of Biosurveillance

Broad Street Cholera Outbreak

- Dr John Snow challenged the prevailing “miasma” theory and proposing that germ-contaminated water was the source of cholera.
- Source of the outbreak was traced to a contaminated pump in London

1854

Hepatitis A Detection

- Scientists used hybridization with radioactive cDNA probes to monitor HepA viruses in sewage samples

1980s

Polio Surveillance

- Epidemiologists used cell culture methods to detect polio virus in wastewater

1940s

PCR-Based Methods

- Polymerase Chain Reaction (PCR) techniques enables rapid and sensitive detection of various pathogens in wastewater, such as enteric viruses, bacteria and parasites

1990s

COVID-19 Monitoring

- Wastewater testing used to track the spread of SARS-CoV-2 and ID outbreaks before symptoms appeared, using high-throughput PCR workflows and automated reporting systems

2020s



Biosurveillance Challenges for a Public Health Officer



How can I obtain a regional picture when it's not my data?



Can I share my data with others?
Can they share with me?



We are encumbered by complicated and broken data sharing processes, overwhelming paperwork...



Will I lose control of my data once shared?

**Focus is on process,
but we need actionable information NOW!**

...diseases span geopolitical borders - we need to understand what is happening regionally...



Dan
Public Health Officer



Biosurveillance Challenges for a Public Health Officer



How can I obtain a regional picture when it's not my data?



Can I share my data with others?
Can they share with me?



We are encumbered by complicated and broken data sharing processes, overwhelming paperwork...



Will I lose control of my data once shared?

**Focus is on process,
but we need actionable information NOW!**

...diseases span geopolitical borders - we need to understand what is happening regionally...

What if...



Dan
Public Health Officer



...I had a regional view, but could also can drill down on my data?



...my data stayed in place?
Others' data stayed on place?



...I could collaborate on common objectives & algorithms?



...the entire process was streamlined, encrypted, and documented (with Verifiable Trust)?

Focus is on INSIGHTS and ACTION!

Our Approach



Additional Barriers to Data-AI Sharing in Public Health

- **Lack of Trust** due to potential misinterpretation, responsible & ethical use of Data, & AI Bias
- Limited Interoperable **Technological Capabilities & Standards** for making Data available for analysis without sharing
- **Restrictive Policies** for Data Sharing resulting from ownership and copyright concerns, potential economic damages, prior negative experiences, etc.



Capability Enabled

Developed, the '**Core Biosurveillance Platform**' enables **Trusted Data-AI Collaboration** across Public Health Stakeholders delivering continuous actionable insights of mutual value through:

- Multiparty, Privacy preserving Computation (In-place Data Collaboration)
- Data Confidentiality, Privacy and IP Protection



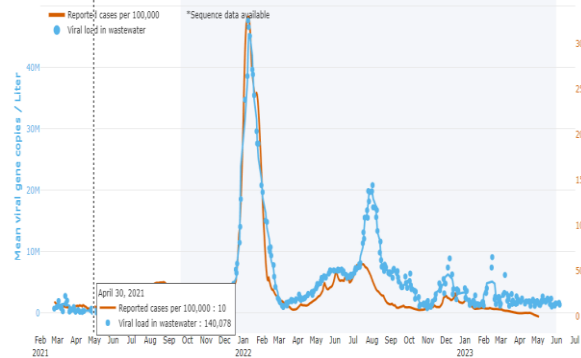
Value Proposition for PHOs and Collaborators

- Improved Public Health Risk Prediction & Remediation
- Intelligent use of Public Health Data with Verifiable Trust in Data & AI
- Enhanced Engagement & Communication across Public Health Stakeholders

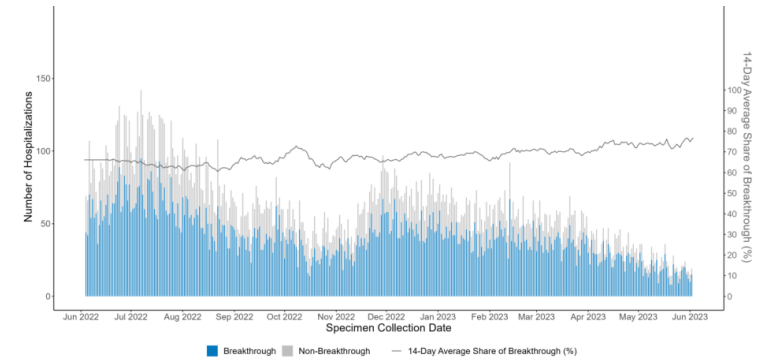
Insights Semantic & Insights Layer

Covid Cases Trends

- Reported Cases
- Wastewater viral loads
- Deaths
- Death/1000
- Cases / Hospitalizations / Deaths
 - by Age
 - by Gender
 - by Ethnicity
 - by Region



Vaccine Breakthrough Analysis

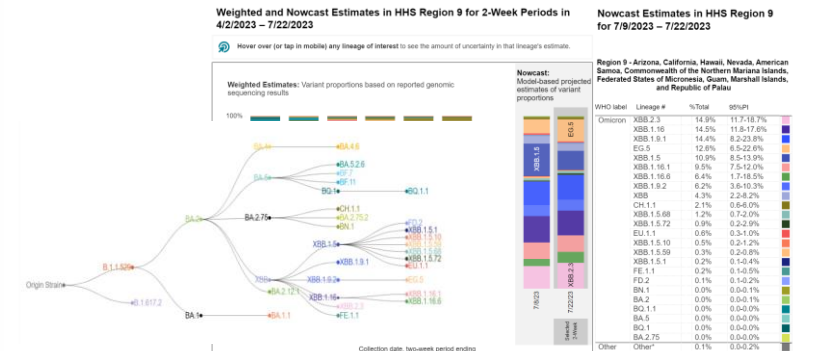


Vaccination Trends

- Doses administered
- % of Population Vaccinated
 - by Age
 - by Gender
 - by Ethnicity



Variant Analysis



birlasoft

**THANK
YOU**

Birlasoft.com

