

Breakout Session 3: Track A

Exploration of Cloud Solutions to Enhance Global Infectious Diseases Research Training Program Activities

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The background features a dark blue gradient with faint, overlapping circular patterns and numerical scales. Some of the visible numbers include 40, 150, 160, 170, 180, 190, 220, 230, 240, 250, and 260. The patterns consist of concentric circles, dashed lines, and arrows, suggesting a technical or scientific theme.

EXPLORATION OF CLOUD SOLUTIONS TO ENHANCE GLOBAL INFECTIOUS DISEASES RESEARCH TRAINING PROGRAM ACTIVITIES

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SPECIFIC AIMS

Parent Award

- 1) Expand the current core of early-stage global infectious diseases investigators utilizing a cutting-edge curriculum with mentored core laboratory experiences that emphasize research design, methods and analytic techniques to address virology research questions that confront Jamaica.
- 2) Provide research training with a multifaceted, integrated mentoring program based on the Individual Development Plan for each trainee that fosters innovative research and enhances the trainees' ability to conceptualize and investigate research problems with increasing independence.
- 3) Continue to develop independent research leaders in virology who will be competitive for extramurally funded research, mentor the next generation of pre-doctoral and post-doctoral trainees and build on the foundation created during the initial GID award period.

NOSI Cloud Solutions Supplement

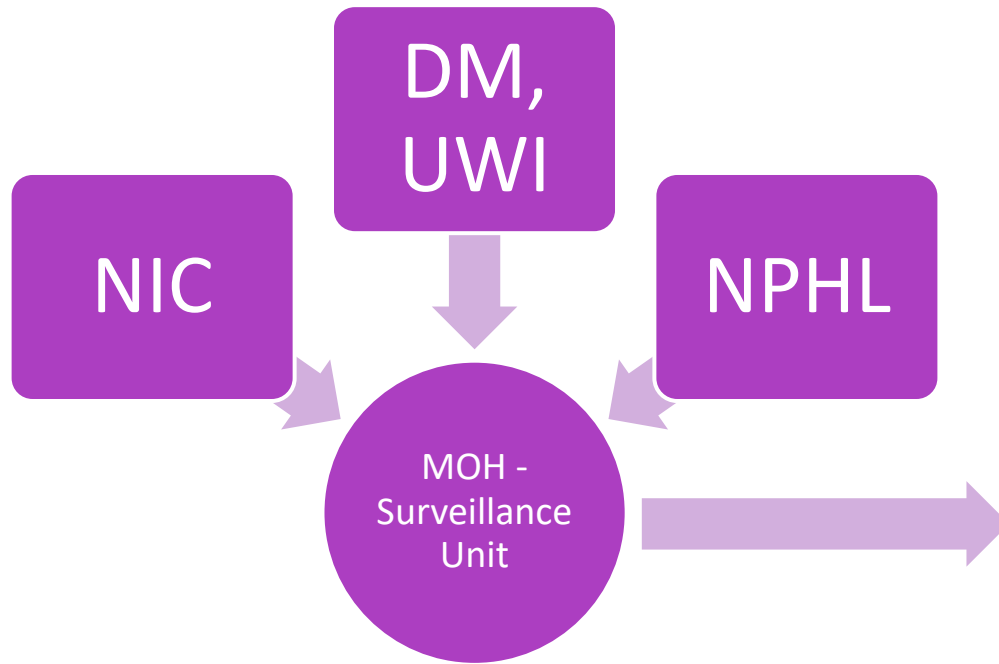
- 1) Develop a cloud-based strategy for enhancing infectious diseases research with the University of the West Indies.
- 2) Utilize data from the National Influenza Center at the University of the West Indies, Mona campus to implement cloud-based solution that will identify health research priorities, disseminate data across the multi-island, UWI campus network.

ARBOVIRAL SURVEILLANCE DATA – JAMAICA DATA INFRASTRUCTURE

- The Caribbean experiences cyclical epidemics of arboviral diseases
- MOH is keen on monitoring the spread of these viruses with routine surveillance.
- Surveilled data are used to publish weekly epidemiological bulletin containing summarized statistics.
 - Raw data is unavailable for deeper analysis and no further research occurs

VIROLOGY SURVEILLANCE IN JAMAICA

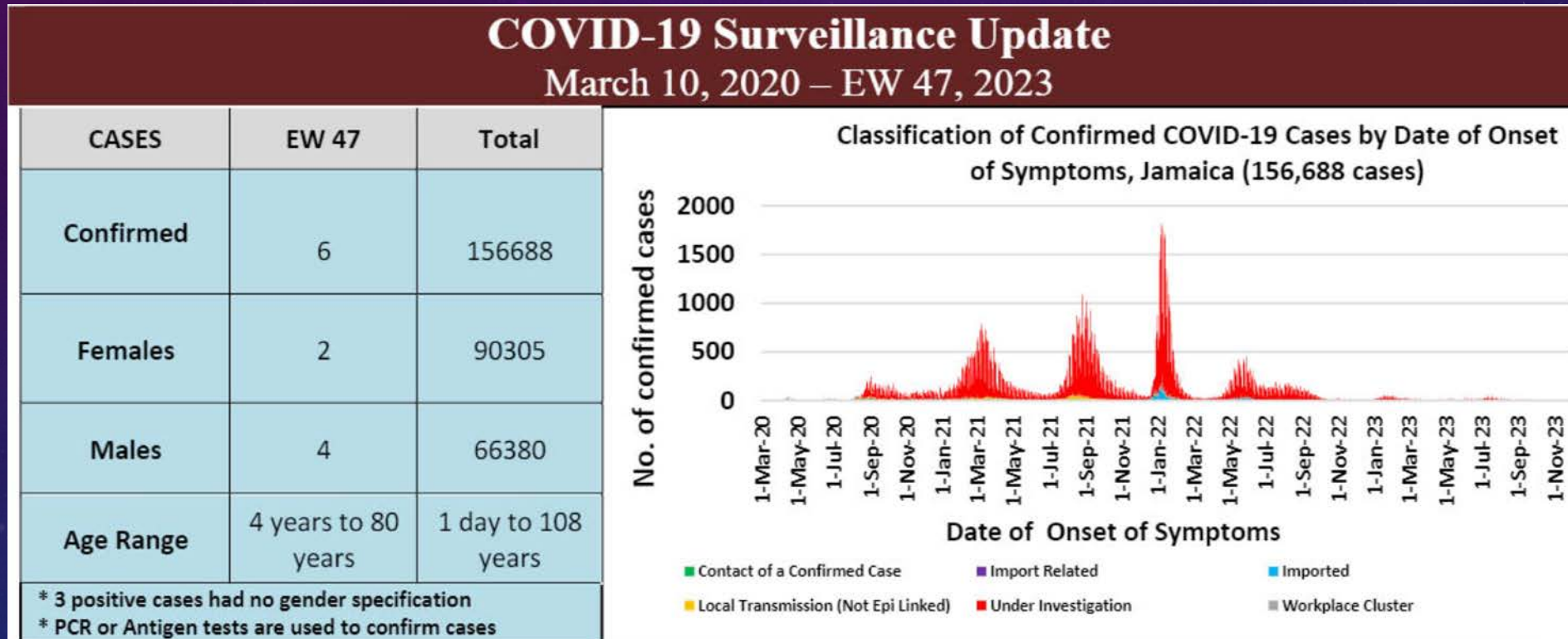
- Dengue Outbreak - September 23, 2023, MOH declares outbreak as the National Surveillance unit reports Jamaica has surpassed the Dengue epidemic threshold for July and August (moh.gov.jm).
- Chikungunya Outbreak – August 5, 2014, local transmission identified. A total of 5, 180 cases reported between May 2014 and Dec 2015 (data.gov.jm).
- Influenza – November 25, 2023, Total of 196 confirmed positive cases (32 – Influenza A, 164 – Influenza B) (Weekly Epidemiology Bulletin - EW47, 2023).



Static Summarized reports

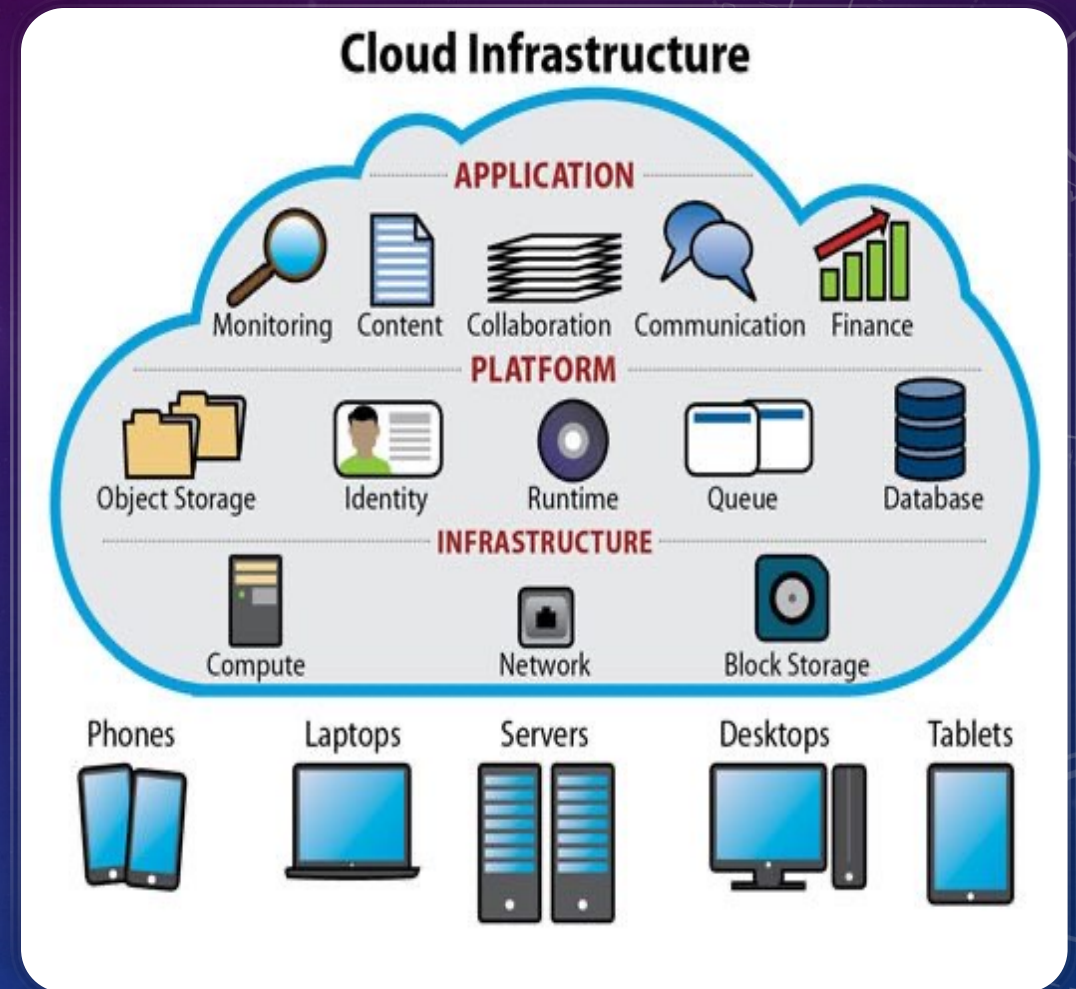
- Weekly Epidemiology Bulletin
- PDF Document
- Web content
- Static Dashboards

COVID-19 SURVEILLANCE UPDATE – EW 47 (WEEK ENDING NOV 25, 2023)



D43 – CLOUD SUPPLEMENT

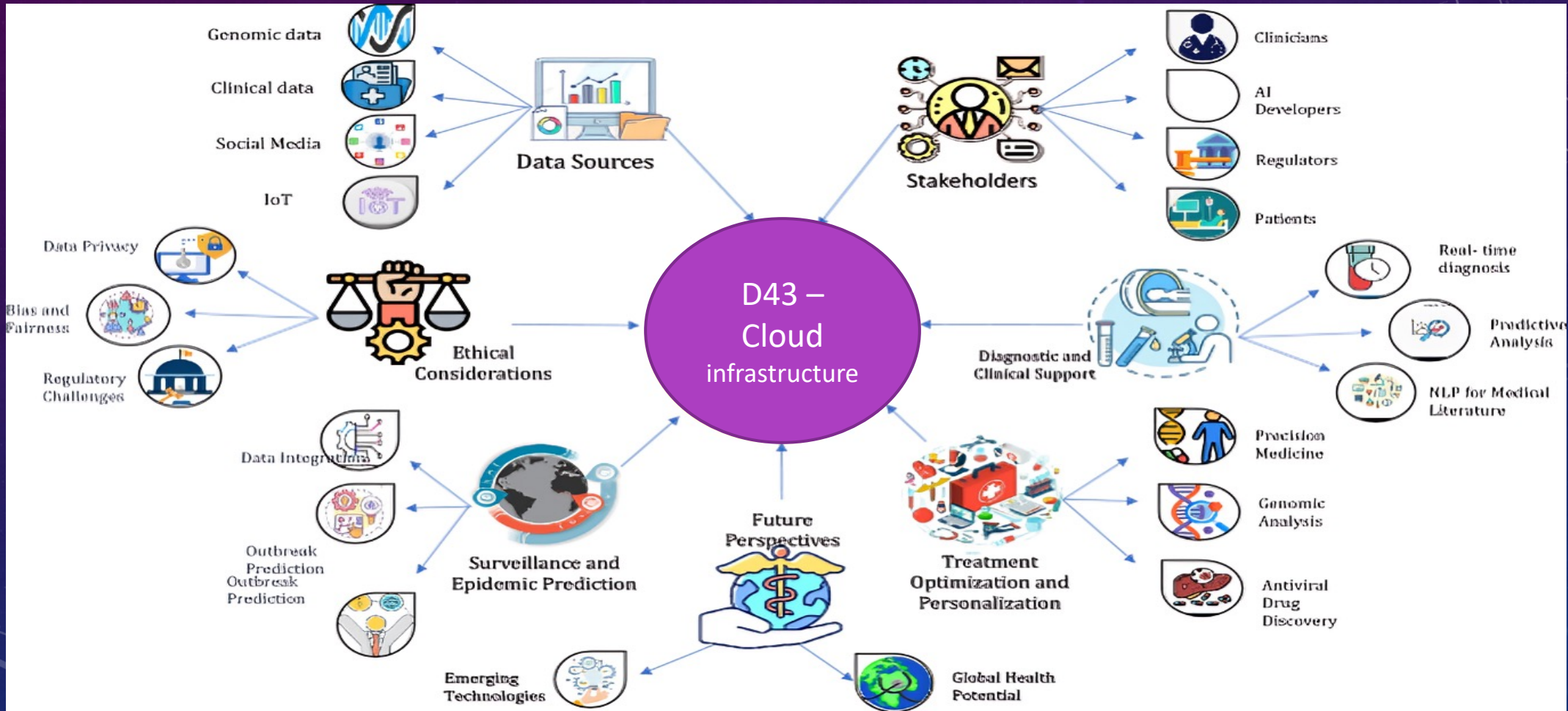
- Implement a cloud infrastructure
 - Genesis of a data lake
 - Data lakes host massive volumes of disparate data from varying sources, in varying formats.
 - Consumable analytics
 - Dynamic Data Ecosystem



METHODOLOGY

- Identify best strategy to migrate data from their source to cloud and train Users
- Setup AWS cloud environment with required permissions and data tenancy requirements
- Migrate data using AWS Glue into Amazon RDS and provide training on how to migrate additional data sets
- Train users across multiple sites to access data using AWS EMR in the cloud for research purposes
- Integrate with AI tools such as data robots to provide data insights
- Assess user experience through survey instruments

WHAT'S NEXT?



POST PROJECT IMPLEMENTATION DERIVED BENEFITS

- **Public Health Insights**
- **Treatment Optimization**
- **Resource Allocation**
- **Early Disease Detection**
- **Epidemiological Research**
- **Cost-Efficiency and Prevention**
- **Healthcare Policy Development**
- **Personalised Precision Medicine**
- **Quality Improvement**

REFERENCES

- 1. Padhi, A., Agarwal, A., Saxena, S. K., & Katoch, C. D. S. (2023). Transforming clinical virology with AI, machine learning and deep learning: a comprehensive review and outlook. *VirusDisease*, 34(3), 345-355.

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