Terra, Zoom, & Public Notion Pages: Virtual Resources for Global Public Health Bioinformatics Workforce Development

Kevin G. Libuit, MS, Theiagen Genomics

APHL IDLC – March 13, 2023
Innovations in Bioinformatics

Maturation of Software Development Practices
- Significant progress towards standardized and scalable solutions for performing pathogen genomics in public health
  - StaPH-B Docker Builds
  - Use of workflow management systems
    - Nextflow, WDL, Snakemake
  - Growing adoption of cloud compute platforms
    - GCP, Azure, AWS
Innovations in Bioinformatics

The Challenge is **Accessibility**
- Use typically requires a **highly-technical practitioner** and sophisticated compute infrastructure
  - Proficiency at command line interface (CLI)
  - System administrators for complex cloud back-ends
- Trainings to develop these advanced practitioners are necessary, but difficult to deploy rapidly and at scale

Urgent need to **bridge the gap** between these technical solutions and the public health workforce
The Terra Platform

Terra is a web application that connects users to bioinformatics workflows & dynamic cloud computing resources through a graphical user interface (GUI).

Provides immediate access to bioinformatics solutions for PHLs.
Terra: Data-Centric User Interface

User interface that is accessible to the public health workforce
Model for Rapid Bioinformatics Workforce Development

- GUI Bioinformatics
- Web Applications
- Virtual Lectures & Office Hours
- Open Access to Training Materials
Virtual Meeting Platform for PHLs
- **Global familiarity** to the Zoom platform and interface
- Allowed trainings in **multiple languages simultaneously**
- **Recorded** sessions

**Zoom: Virtual Lectures and Office Hours**

- **Formal Lectures**
- **Weekly Office Hours**
Engagement with virtual cohort through active polling, open discussions, and post-lecture quizzes

Introduce hands-on exercises as early in the trainings as possible
Notion is a note-taking application that facilitates rapid creation of publicly-accessible webpages.

- Solution for easily distributing of training materials.

Participants can review and access training material at their convenience.
Model for Rapid Bioinformatics Workforce Development

Training Public Health Scientists on Critical Technologies

- **Develop trainings** for use of the Terra platform to perform pathogen genomics
- **Deliver of materials** through Zoom to allow training of scientists in the global public health community
- **Enable open and asynchronous access** to training materials through public Notion pages

We have applied this **framework** to train an estimated **800 participants** representing over **40 countries** worldwide
Workforce Development Must Include Solutions for Providing Ongoing Support

Technical Support for Global Training Cohort

- Time Zones and Availability
- Forums of Communication
- Follow-Up Site Visit
Follow-Up Site Visits

Opportunity to reinforce materials that were delivered virtually
Follow-Up Site Visits

Site visits also help to strengthen trainer-trainee relationships
Acknowledgements

Global Community of Public Health and Pathogen Genomics Scientists