23 April 2021

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Genomic Surveillance:

At-scale SARS-CoV-2 Sequencing

Brian Krueger Labcorp

Coronavirus Standards Working Group

What should a Coronavirus Standards Working Group do?



Assure development and availability of standards, controls, interlab testing, knowledge to support successful rollout & scaling of 2019-nCoV testing



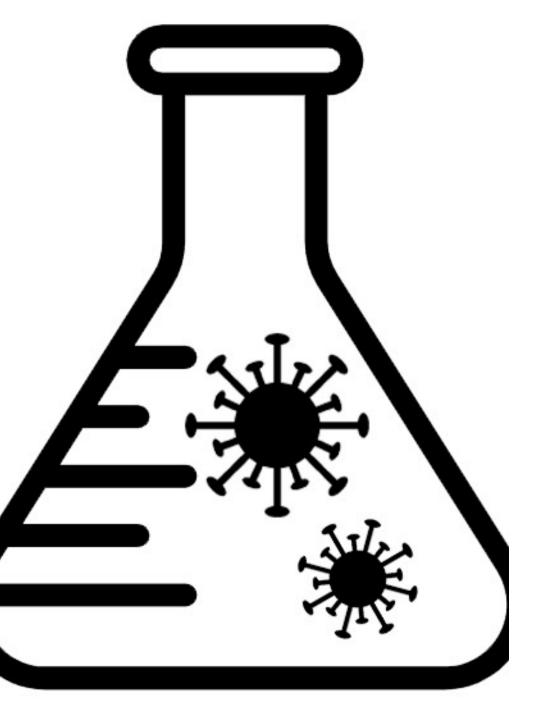
Identify and develop critical infrastructure to support...

confidence in test results interoperability scale-up long-term capacity



Identify best practices that should be institutionalized

Learn what we need to so next time we have a global network in place ready to make standards.



Agenda

Updates

- Viral RNA Harmonization
- Serology Harmonization Study
- Standards for Genomic Surveillance

SARS-CoV-2 Pandemic Surveillance

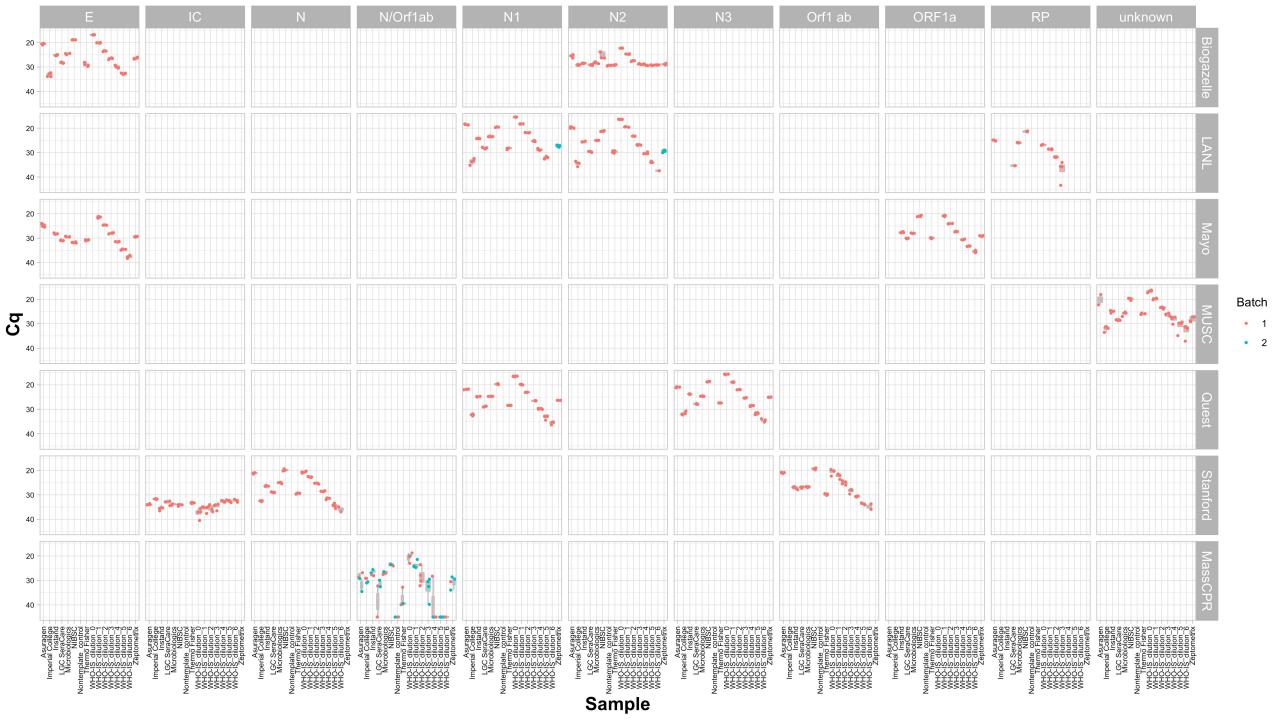
• Brian Krueger

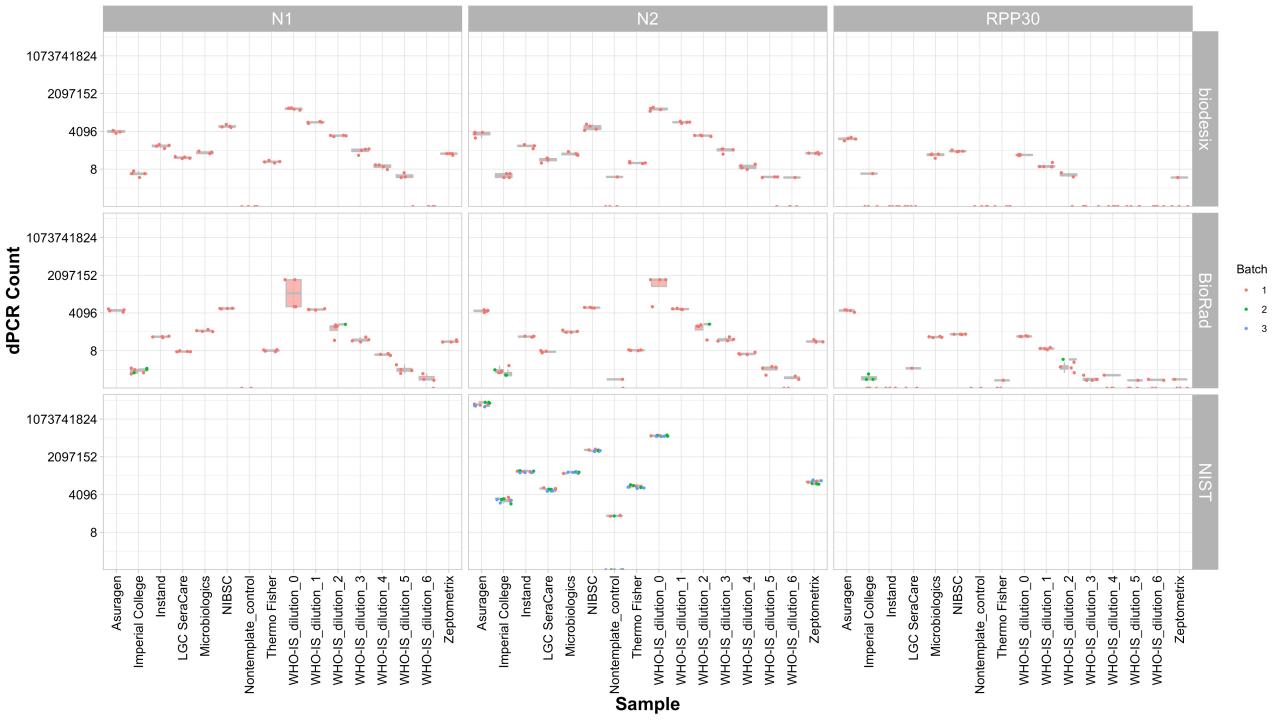
Viral RNA Harmonization Study Data

- Data in from 10/14 labs
- Sample panel on its way to Slovenia (thanks Mojca and Jo!)
- Preliminary Data Munging done; needs review and controlled vocabulary massage
 - target names, dilutions, pre-calculations...

CSWG Viral RNA Harmonization Study Status

	NIST	NML/LGC	NIB (Slovenia)	Bio-Rad	Western	MUSC	Мауо	Labcorp	Quest	Biogazelle	MassCPR Diagnostics	Stanford Medicine	Los Alamos	biodesix
Panel Received	~	~		~	~	~	~	~	~	~	~	~	\checkmark	\checkmark
Lab Metadata Entry Initiated	~			\checkmark		✓	\checkmark	✓	\checkmark	✓	\checkmark	\checkmark	✓	~
Lab Metadata Entry Complete	~			\checkmark		\checkmark	\checkmark		~	\checkmark	\checkmark	~	\checkmark	\checkmark
Lab Data Received	~			~		~	~		\checkmark	\checkmark	\checkmark	✓	\checkmark	\checkmark
Data Summarized	~			~		~	~		~	~	\checkmark	~	\checkmark	~





Serology Harmonization Study

- Team Meeting, 13 April
 - Serology measurements relatively complex
 - Diagnostic applications less mature
 - correlates of protection still being established
 - NCI Serology Task Force established a US Standard
 - Troy Kemp will present next week

- Options going forward
 - CSWG designs and operates a harmonization study as a standards-setting effort
 - CSWG acts as a "network hub" for University of Colorado team's leadership of the study

What can we do to support community to understand & report sequencing data quality?

What can we do to be confident in genomic surveillance?

Shared, widely available genome reference samples

- Establish a library of reference samples representing strains of interest
- use strain library from BEI

Authoritative Characterization

- Integrate results from multiple sequencing platforms
- distinguish between variation and sequencing artifacts

Open Data

- Make available raw data from characterization
- multiple technologies
- data support methods development

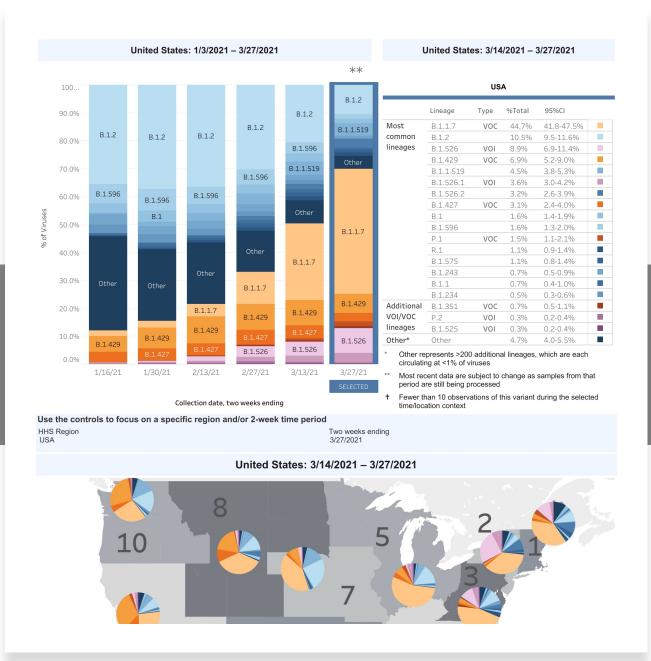
Reference Pipeline

- Make available full analysis for characterization
- offer prototype analysis pipeline for field use

Benchmarking Tool

- Enable field use of reference samples to evaluate performance of...
- wet lab
- dry lab

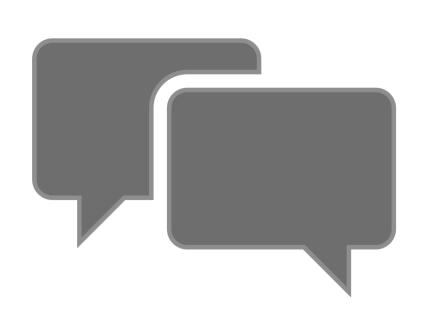
Deliver technology-agnostic standards for Wet Lab -> Dry Lab -> Public Health



How RT-PCR
Testing Allows
Labcorp to Perform
National SARS-CoV2 Pandemic
Surveillance

Brian Krueger, Laboratory Corporation of America

from https://covid.cdc.gov/covid-data-tracker/#variant-proportions



Discussion