The Status of NGS in PHLs
Where We Are and Where We’re Going
Next Generation Sequencing

• Has the potential to significantly change how we generate and analyze data
• Applications in many areas of public health and agriculture laboratories
• Important to determine the status and needs of APHL member labs
APHL NGS Survey

Where are we?
APHL Next Generation Sequencing Survey

- Fielded on October 27, 2014 and officially closed on December 24, 2014
- 50 of 51 SPHLs responded (98%)
- 18 of 46 LPHLs responded (39%)
- Overall response rate 70%
PHLs with NGS Instruments - Currently

21/50
SPHLs with Instruments
Plans to Purchase in Next 12 Months

9 of 29 SPHLs Plan to Purchase Instruments in 2015
Potential NGS Landscape at the end of 2015 (30/50 SPHLs)

- **Will have NGS Instrument**
- **No Plans to have NGS Instrument**
Reasons for Not Purchasing NGS Instrumentation in SPHLs

- 20 SPHLs with no plans to purchase
- Most common reasons cited:
  - No available funding (19)
  - Waiting for applications to be more fully developed (10)
  - Technology Too Expensive (9)
  - Insufficient staffing (8)
PHL NGS Applications: Current

Foodborne Pathogens! (21/21)

And everything else:

• Mycobacteria (6)
• CRE/ KPC (5)
• Newborn Screening (3)
• HCV (2)
• Influenza (2)
• Other Respiratory Pathogens (2)
Bioinformatics

Sources of Bioinformatics Expertise in PHLs (n=33)

- External Partnership: 17
- Laboratory Staff Trained to Perform Bioinformatic Analysis: 8
- Bioinformaticians on Staff: 1
- No Access To Bioinformatics Expertise: 12
Training Needs

Training Needs in PHLs with Existing Instrumentation (n=21)
NGS Gaps; Where to Go From Here

- Utility of NGS for foodborne pathogens well understood, but...
  - Concordance of NGS and epidemiological data still being studied
- Define applications and role of PHLs beyond foodborne pathogens
  - Need to engage stakeholders
- Transmission of NGS data
  - Define mechanism, funding, IT infrastructure, data storage
  - Establish data sharing agreements
- Training of PH laboratorians in NGS testing procedures, bioinformatics, and NGS data standards
  - Highlighted as a critical need
AMD Roadmap
Where are we going?
CDC’s Advanced Molecular Detection Initiative

• 5-year initiative with a goal of transforming disease detection and response through technological innovation

• Investment in projects to increase NGS and bioinformatics capacities

• Projects span multiple CDC labs and includes state and local partner laboratories
CDC/APHL AMD Strategic Mapping Session – 2015

• **Purpose**
  – Broadly outline future directions for engagement of public health system in AMD implementation
  – Includes building capacity for NGS and bioinformatics in state and local public health jurisdictions
  – Ensure integration into CDC’s agency wide approach to AMD

• **Organizations Represented**
  – State and Local PHLs, CDC, CSTE, and ASTHO

• **Outcomes**
  – Development of a strategic map
Transform Disease Detection, Surveillance, Prevention and Control by an Integrated Approach to AMD Implementation

Central Challenge
CDC/APHL Advanced Molecular Detection (AMD) Strategic Map
Strategic Map: 2015-2017

Transform Disease Detection, Surveillance, Prevention and Control by an Integrated Approach to AMD Implementation

A
Build a Sustainable AMD Network Among Stakeholders

B
Develop Approaches for Action-Oriented Molecular Analysis

C
Develop and Support the Workforce to Meet Current and Future Needs

D
Secure and Deploy the Needed Financial Resources

Strategic Priorities
Conclusions/ Next Steps

- Reinforce importance of AMD to policy makers
- Establish leadership structure
  - Ensure implementation of the strategic map
  - Representation from stakeholders
- PHL representatives will join CDC’s “AMD State Working Group”
  - Provide state perspective on ongoing AMD projects
  - Identify high priority/impact projects.