APHL Next Generation Sequencing (NGS) Survey

Next Generation Sequencing

1. How long has your lab had a sequencer?
   
1a. How many laboratory staff are trained to perform sequencing?

   ___ Dedicated sequencing staff (enter whole number)
   ___ Trained staff to perform sequencing (enter whole number)

1b. Which of the following instruments does your laboratory have? Please check all that apply.

   □ Illumina HiSeq
   □ Illumina MiSeq
   □ Illumina NexSeq 500
   □ Illumina MiniSeq
   □ IonTorrent PGM
   □ IonTorrent Proton
   □ Oxford MinION
   □ PacBio RS
   □ PacBio RS II
   □ Other—please specify:

1c. How many of the following instruments do you have?

1d. What funding source(s) were used to purchase your NGS instrument(s)? Please check all that apply.

   □ CDC funds
   □ FDA funds
   □ State funds
   □ Other funding mechanism -please specify:
   □ Other Grant Funds-please specify grant:

1e. Where in your laboratory is the NGS instrument(s) located? Please check all that apply.

   □ Bacteriology
   □ Microbiology
   □ Molecular section
   □ Newborn Screening
   □ Sequencing Core
   □ Virology
   □ Other—please specify:
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1f. Please select the pathogens and/or disorders for which NGS applications are currently being used in your laboratory:

- Bacterial Meningitis Pathogens
- Norovirus and other viral foodborne pathogens
- Healthcare Acquired Infectious Agents (CRE, *Clostridium difficile*, etc.)
- Hepatitis C Virus
- HIV
- *Influenza*
- *Legionella*
- *Mycobacterium tuberculosis*
- *Neisseria gonorrhoea*
- Pulsenet Pathogens
- Respiratory Pathogens (Viral)
- Respiratory Pathogens (Bacterial)
- Viral Vaccine Preventable Diseases
- Newborn screening
- Other (Please specify)
- None of the above

1g. Please select the pathogens and/or disorders for which NGS applications you are most interested in pursuing in the next 12 months (limit 3)

- Bacterial Meningitis Pathogens
- Norovirus and other viral foodborne pathogens
- Healthcare Acquired Infectious Agents (CRE, *Clostridium difficile*, etc.)
- Hepatitis C Virus
- HIV
- *Influenza*
- *Legionella*
- *Mycobacterium tuberculosis*
- *Neisseria gonorrhoea*
- Pulsenet Pathogens
- Respiratory Pathogens (Viral)
- Respiratory Pathogens (Bacterial)
- Viral Vaccine Preventable Diseases
- Newborn screening
- Other (Please specify)

**Data Storage/ Transmission**

2. How do you store NGS data generated in or for your laboratory? Please check all that apply.

- In-house server
- Instrument manufacturer owned cloud (e.g. BaseSpace)
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3. Do you have a data retention policy?
   □ Yes
   □ No

4. Do you share any NGS data generated in your laboratory with other entities as part of a network or other partnership?
   □ Yes (proceed to question 4a-b)
   □ No (proceed to question 4c)

4a. Which data sharing networks do you currently participate in? Please check all that apply. Only include networks that share sequencing data.
   □ 100,000 Genome Project
   □ Next Generation PulseNet
   □ FDA Genome Traker
   □ NCBI SRA submission
   □ Basespace
   □ PulseNet USA
   □ National Influenza reference center
   □ ARLN
   □ Partnership with industry or academic institution (please include list of partners, data that is shared, and mechanism for sharing data)
   □ Partnership with another state or local public health laboratory(s) (Please include list of partners, data that is shared, and mechanism for sharing data)
   □ Partnership with other CDC Programs/ Surveillance Systems (please describe)
   □ Other CDC support programs – please specify
   □ Sequences shared on GenBank but not part of larger initiative
   □ Other-please specify:

4b. What data sharing mechanisms are you currently using? (check all that apply)
   □ FTP
   □ Basespace
   □ AIMS
   □ Amazon web services
   □ Google cloud services
   □ Microsoft Azure
   □ AMD portal
   □ GenBank
   □ Other
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4c. What are the reasons for not sharing any NGS laboratory generated data with other entities? Please check all that apply.

- Data sharing agreements won’t allow my laboratory to share data
- There are no relevant partners for the data generated in my laboratory
- There is no mechanism in place to share data securely/ easily
- Other reason - please specify:

Data Analysis/ Bioinformatics

5. Which of the following sources of bioinformatics expertise do you have access to? Please check all that apply.

- Bioinformaticians on staff
- Other staff trained to perform bioinformatics analysis
- Access to bioinformaticians through external partnership
- Regional resource
- Bioinformatics fellow
- No access to bioinformaticians

5a. What platforms are you using for bioinformatics analysis? Please check all that apply.

- Commercial software on local PC/Mac
- Basespace
- Local LINUX machine
- Virtual LINUX machine on local PC/Mac
- Virtual LINUX machine in cloud
- LINUX machine at affiliated University/Institution
- Other – please specify

5b. What commercial software and databases do you use? Please check all that apply.

- Bionumerics
- CLC Bio
- Smart Gene
- Other – please specify

5c. How many bioinformaticians does your laboratory have on staff? (Include fellows and contractors) Please enter whole number.

5d. How many other staff in your laboratory are trained to perform data analysis? Please enter whole number.

5e. Please describe the nature of data analysis performed by trained staff.

5f. What is the nature of your external bioinformatics partnership(s)? Please check all that apply.

- My laboratory collaborates with CDC for bioinformatics expertise
- My laboratory collaborates with NCBI for bioinformatics expertise
- My laboratory is affiliated with a university or institution that has bioinformatics expertise
- My laboratory partners with a university or institution that has bioinformatics expertise
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- My laboratory collaborates with another PHL – please specify
- Other -please specify:

5g. Do you develop bioinformatics pipelines in house or with a non-CDC partner?
- Yes
- No

**Training and Capacity Needs**

6a. Please select the NGS training course(s) your staff have attended.

- CDC Web Lab workshop delivered at CDC
- Regional worship hosted by a public health laboratory
- Individual training from a partner laboratory (CDC, PHL, or academic) hosted in their laboratory
- Individual training from a partner laboratory (CDC, PHL, or academic) hosted in your laboratory
- Training provided by equipment or software vendor
- Formal course or workshop provided by academic institution
- Virtual Workshop/webinar
- None of the above

6b. How many individuals have received training in these areas? (whole number)

6c. Which group of individuals still need training in NGS?

- Bench scientists
- Supervisors
- IT staff
- Lab directors
- Epidemiologists
- Other:

6d. Please specify which areas each individuals checked above would benefit from additional training.

7. Please rank your 3 biggest implementation challenges:

- Training existing staff to perform NGS
- Recruiting/retaining staff with skills to perform NGS
- Procurement of NGS instrumentation or software
- Establishing IT infrastructure to support NGS
- Identifying training opportunities that meet my laboratory’s needs
- Training existing staff to analyze NGS data
- Recruiting Bioinformaticians/identifying external source of bioinformatics expertise
- Establishing quality systems for NGS
- Other – please specify
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8. Please provide the names and email addresses for your laboratory’s NGS point of contact.

   Name:

   Email:

9. Please provide any additional comments:

   Thank you for completing the survey!