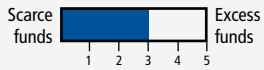
Brunei
Country Profile

Results from the Asia PGI Landscape Assessment (2023)

This country report provides a snapshot of the status of pathogen genomic surveillance through next generation sequencing (NGS) in Brunei Darussalam. Results are based on a landscape assessment conducted with country experts working at The Department of Laboratory Services, Ministry of Health. While pathogen genomic sequencing for surveillance is still a recently adopted practice in Brunei, both national and global efforts are striving to make it a priority for the country's defence against infectious diseases. Findings below are presented through five overarching themes ranging from financing to bioinformatics and data sharing, including 16 key indicators covering major barriers in pathogen genomics sequencing and surveillance. The data captured below is as of March 2023.

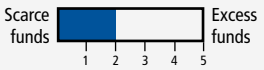
Financing

Sufficient funding for NGS



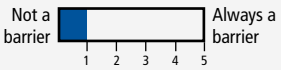
A ranking of perceived sufficiency of funding to support pathogen genomic surveillance over the next 5-year period.

Sustainable funding for NGS



A ranking of perceived sustainability of funding to support pathogen genomic surveillance over the next 5-year period.

Reliance on external support



Country reliance on external support for conducting adequate and effective NGS.

Policy and guidelines

Strategic plan

In progress

Status of national strategic plan which includes pathogen genomic surveillance.

National expert panel

In progress

Formation of national expert panel or technical advisory group mandated to advise government on pathogen genomic surveillance.

NGS guidelines for public health surveillance

In progress

Development of national guidelines for infectious disease surveillance using NGS.

NGS = Next Generation Sequencing

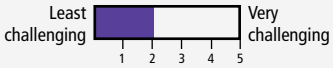
Supply chain

Equipment repair lead time

No data available
as of March 2023

A ranking of perceived challenges with equipment repair lead time in the last 6 months.

Stock availability – reagents and consumables



A ranking of perceived challenges with reagents/consumables stock-outs for sequencing in the last 6 months.

Resupply time length

10
weeks

Average re-supply time between order and receipt at the laboratory for reagents and consumables.

Laboratory infrastructure

Laboratory capacity

1
22 per **10,000,000** population

Total number of laboratories in country performing NGS for infectious disease surveillance.

Sequencing output

376
4490 per **10,000,000** population

Average monthly sequencing output within the past year.

Sequencing utilization

100%

Proportion of average actual monthly sequencing output over maximum monthly sequencing capacity for the past 12 months.

External quality assurance

In progress

Laboratories participating in any proficiency testing or external quality assurance audits for NGS.

Bioinformatics and data sharing

Bioinformatics pipelines for NGS

In use

Containerized, locally installed or in-house pipelines/workflows.

In use

Tools provided by NGS manufacturer or proprietary software.

Data sharing

> 75%

Estimated monthly proportion of sequences shared on public databases (eg. NCBI, GISAID) compared to total sequences.

Reporting frequency

Reporting frequency of pathogen genomic surveillance results to relevant government ministries.

NGS = Next Generation Sequencing

Summary

- Between 2020 and 2022, 100% of NGS for pathogen genomic surveillance took place in the public sector. Before sequencing capacity was available in Brunei Darussalam, samples collected for pathogen genomic surveillance by the government were processed out of the country.
- Currently, laboratories conducting NGS for pathogen genomic surveillance in Brunei Darussalam are not required to be registered.
- Over the past year, the estimated proportion of spending on NGS for pathogen genomics surveillance was 100% from donations.
- The country has gained strong external partner support during COVID-19. The type of support provided includes donation of equipment and reagents, laboratory training, bioinformatics training, data processing and data analysis.
- There is currently no national annual budget allocation for genomic surveillance and no policy guidelines for pathogen genomic surveillance is present in the country.
- Labor costs such as laboratory staff and bioinformatics staff were identified as moderate cost drivers for direct sample and processing costs.
- There is currently no national research agenda or plan for the additional use of pathogen genomics data other than for surveillance purposes.
- There is only one machine dedicated to pathogen genomic surveillance and it is performing at its full capacity.
- It has been found that there has been a breakdown of NGS equipment in the past 6 months.
- The country currently relies mainly on tools provided by NGS manufacturers (>75%). Additionally, intermediate bioinformatics capability exists, with <50% of analysis being performed using published workflows or in-house pipelines that are typically based on command-line interface.
- Equipment, Human Resources and Infrastructure were identified as key barriers (4 or 5 on a scale of 5)
- All categories including training, computer infrastructure, equipment, reagents except consumables were identified as essential priorities.