



# Thailand

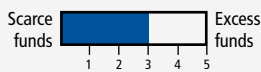
## Country Profile

Results from the Asia PGI Landscape Assessment (2023)

This country report provides a snapshot of the Landscape Assessment results, summarising the status of pathogen genomic surveillance through next generation sequencing (NGS) in Thailand. The Department of Medical Sciences, under the Ministry of Public Health, is the national institution responsible for coordinating pathogen genomic surveillance in Thailand. They collaborate with other national agencies including the Health Systems Research Institute, the National Science and Technology Development Agency, and major Thai academic institutes, such as Mahidol University, which are supported by the Thai government. 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.

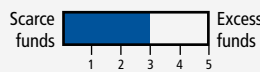
### Financing

#### Sufficient funding for NGS



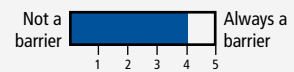
A ranking of perceived sufficiency of funding to support pathogen genomic surveillance over the next 5-year period.

#### 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

**Well integrated**

Status of national strategic plan which includes pathogen genomic surveillance.

#### National expert panel

**Well integrated**

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

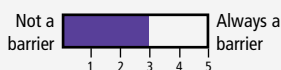
#### NGS guidelines for public health surveillance

**Well integrated**

Development of national guidelines for infectious disease surveillance using NGS.

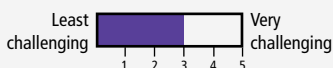
## Supply chain

### Equipment repair lead time



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

**5.4**  
weeks

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

## Laboratory infrastructure

### Laboratory capacity

**3**

0.042 per 10,000,000 population

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

### Sequencing output

**2,384**

33 per 10,000,000 population

Average monthly sequencing output within the past year.

### Sequencing utilization

**89%**

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

### External quality assurance

**Participating**

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.

## Summary

- Between 2020 and 2022, 75% of NGS for pathogen genomic surveillance took place in the public sector and 25% in academic institutions.
- Thailand sequences all its priority pathogens primarily in country and not out of the country.
- Over the past year, the estimated proportion of spending on NGS for pathogen genomics surveillance was: 75% from the public sector, 25% from the private sector.
- Over the past year, the major direct cost drivers were identified to be laboratory equipment (sequencing machines, sample storage equipment) and laboratory supplies & consumables (reagents, PPE, etc.).
- The major indirect cost driver was Maintenance contract costs (for equipment, facilities, storage).
- Thailand has 20 NGS machines across a range of platforms including Illumina (n=10, 50%), ONT (n=5, 25%), and Thermo Fisher (n=5, 25%).
- The average re-supply time between order and receipt of reagents and consumables for Illumina, ONT and Thermo Fisher is 4 – 6 weeks.
- In terms of data sharing, Thailand shares genome sequences, deidentified metadata and raw FastQ both nationally and internationally.
- The main process barrier faced by laboratories conducting NGS is data sharing and reporting, computing power and storage, and human resources (availability of trained personnel).
- Many financing/policy barriers for NGS were ranked highly. These included inadequate budget, lack of national plan and guidelines, over-reliance on external funding, and lack of industry/private sector involvement.
- All training priorities for enhancing NGS capacity were ranked highly. This included the full NGS process from sample pre-processing to data reporting and sharing.
- The main areas for infrastructure support were calibration, services & maintenance, as well improvements in cold chain.