

Nepal

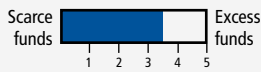
Country Profile

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 Nepal as of March 2023. Data are based on a systematic assessment accompanied by interviews with country experts working across partner organisations which are the National Public Health Laboratory (NPHL), and the World Health Organization (WHO), Country Office for Nepal. 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.

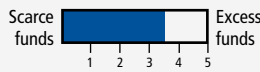
Financing

Sufficient funding for NGS



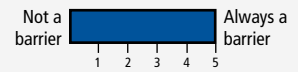
A ranking of perceived sufficiency of funding to support pathogen genomic surveillance over the next 5-year period.

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

Well integrated

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

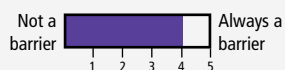
NGS guidelines for public health surveillance

In progress

Development of national guidelines for infectious disease surveillance using NGS.

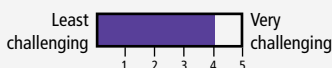
Supply chain

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

4
weeks

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

Laboratory infrastructure

Laboratory capacity

4

1.33 per 10,000,000 population

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

Sequencing output

50

16.64 per 10,000,000 population

Average monthly sequencing output within the past year.

Sequencing utilization

10%

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

Not in use

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

In use

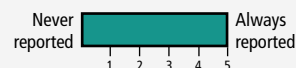
Tools provided by NGS manufacturer or proprietary software.

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, 50% of NGS related pathogen genomic surveillance took place in the public sector and the remaining 50% in the private sector.
- Currently, laboratories conducting NGS for pathogen genomic surveillance in Nepal are not required to be registered.
- Over the past year, the estimated proportion of spending on NGS for pathogen genomics surveillance was; 80% from external partner-based funding, 20% from public funding.
- National partners are Epidemiology & Disease Control Division (EDCD) and the external partners are mainly WHO, Save The Children and FHI 360.
- The ministry responsible for pathogen genomic surveillance capacity is the Ministry of Health and Population (MoHP).
- Laboratory supplies & consumables were identified as major cost drivers followed by staff training as moderate cost drivers for direct sample and processing costs.
- Supply chain & procurement-related costs were major cost drivers among indirect costs.
- Sequencing machines used in Nepal are from Illumina (n=2) and Oxford Nanopore Technologies (ONT) (n=1).
- Procurement process is centrally coordinated via National Public Health Laboratory (except for non-reagent consumables) while supply forecasting is conducted individual facilities.
- The highest biosafety level (BSL) laboratory available in the country is level 2. There are no national biosafety regulations governing use and access to BSL 3 and 4 agents.
- The main process barrier faced by laboratories conducting NGS is related to reagents and consumables and samples (transportation time, quality).
- The main financial barrier related to over reliance on external funders. Followed by inadequate budget and in-country resource constraints.
- The country's main training priorities to enhance NGS capacity was relating to library preparation.
- Maintenance and availability were essential priorities among factors related to laboratory and sequencing equipment. Availability and lead time were marked as essential priority for factors relating to sequencing reagents.