



**NATIONAL INSTITUTE FOR
COMMUNICABLE DISEASES**

Division of the National Health Laboratory Service

The Importance of Biosafety and Biosecurity in Respiratory Virus Genomics Surveillance

Valencia Petje

Biosafety and Biosecurity Representative

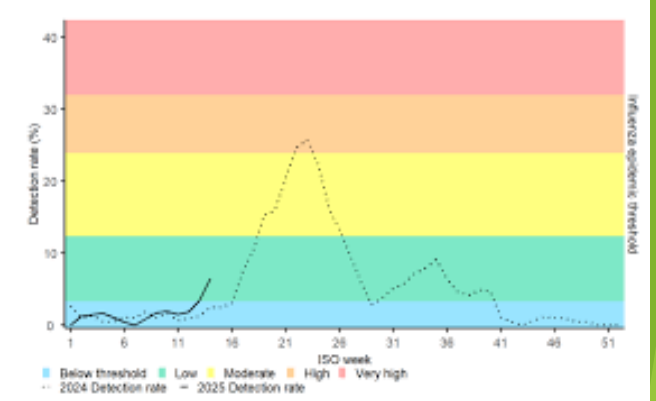
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Introduction

- ▶ Respiratory virus genomics surveillance = sequencing viruses (e.g. influenza, RSV and SARS-CoV-2).
- ▶ Purpose: detect variants, guide vaccines and monitor outbreaks.
- ▶ Two pillars:
 - ▶ **Biosafety** → protect people & environment resulting overall safety
 - ▶ **Biosecurity** → prevent misuse & protect data resulting in responsible data/sample protection.

Why Surveillance Matters

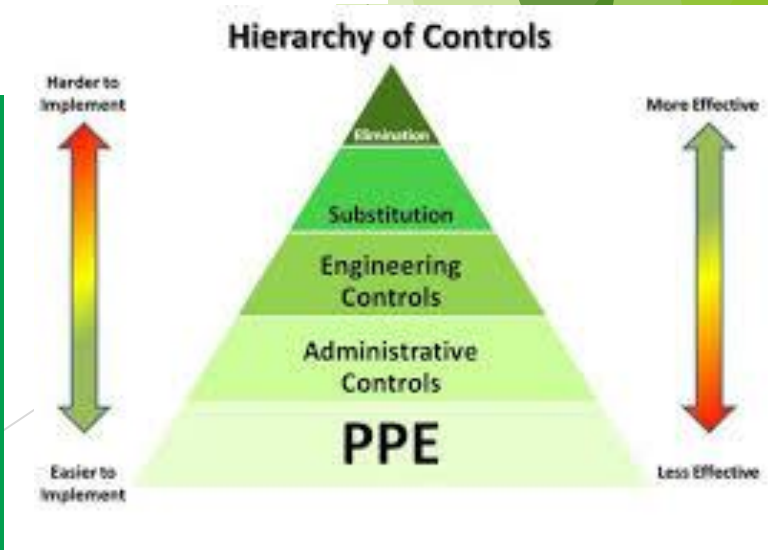
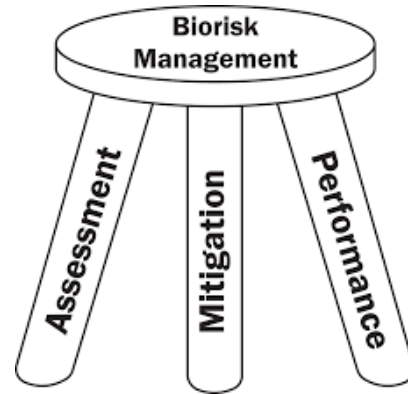
- ▶ Early warning system for new variants.
- ▶ Helps design updated vaccines & diagnostics.
- ▶ Supports global pandemic preparedness.
- ▶ Relies on safe and trusted labs.



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Biosafety Basics

- ▶ Protects people, lab staff, and community.
- ▶ Focus: safe handling of infectious samples.
- ▶ Key practices:
 - ▶ Hierarchy of controls
 - ▶ Continuous Risk Assessments



Biosafety in Surveillance

- ▶ Clinical samples may contain live viruses.
- ▶ Risks: accidental infections, lab contamination, outbreaks.
- ▶ Case example: Lanzhou brucellosis leak (2019):

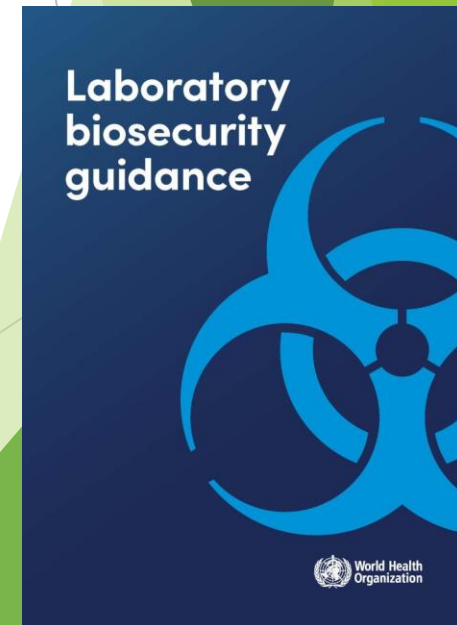


Good biosafety = safe, reliable surveillance.

Biosecurity Basics

- ▶ Protects against misuse of pathogens & data.
- ▶ Ensures responsible access to:
 - ▶ Virus samples.
 - ▶ Genome sequences.
- ▶ Includes:
 - ▶ Access control.
 - ▶ Secure data sharing.
 - ▶ Dual-use risk management.

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Biosecurity in Surveillance

- ▶ Genomic data can be misused (synthetic biology risks).
- ▶ Countries need trust to share data (e.g. GISAID).
- ▶ **Case example:** H5N1 gain-of-function debate.



Good biosecurity = global cooperation

Biosafety and Biosecurity Together

- ▶ Both are essential for:
 - ▶ Public health safety.
 - ▶ Accurate surveillance.
 - ▶ Pandemic preparedness.
- ▶ Together, they ensure surveillance is:
 - ▶ Safe.
 - ▶ Reliable.
 - ▶ Globally trusted.



Visitors Safety Briefing (NICD, a subdivision of NHLS)

