Cancer Surveillance: From Data to Public Health Action

Asynchronous Session: Concepts, Practice & Application

Rauf Shah, MPH-EPI (Fall 2025)

Course:
PUBLIC HEALTH TEACHING AND TRAINING



Learning Objectives



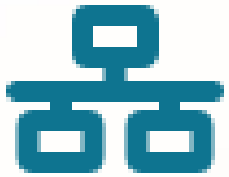
Define & Compare

Distinguish between passive, active, sentinel, and syndromic surveillance methods.



Apply Rules

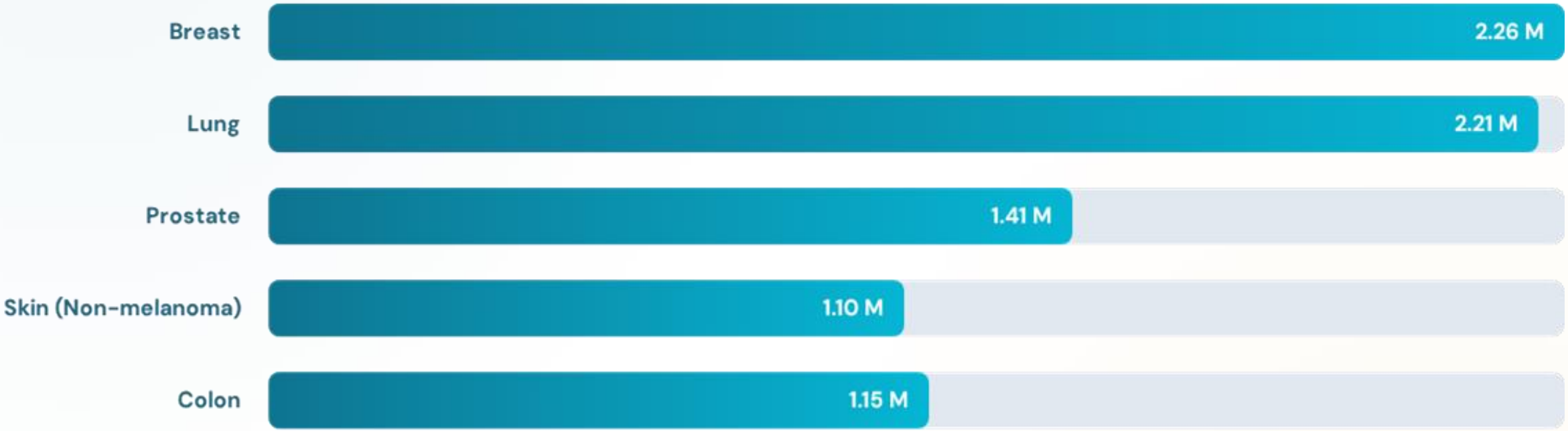
Utilize ICD-O-3, staging systems, and reportability rules to classify cases accurately.



Identify Workflow

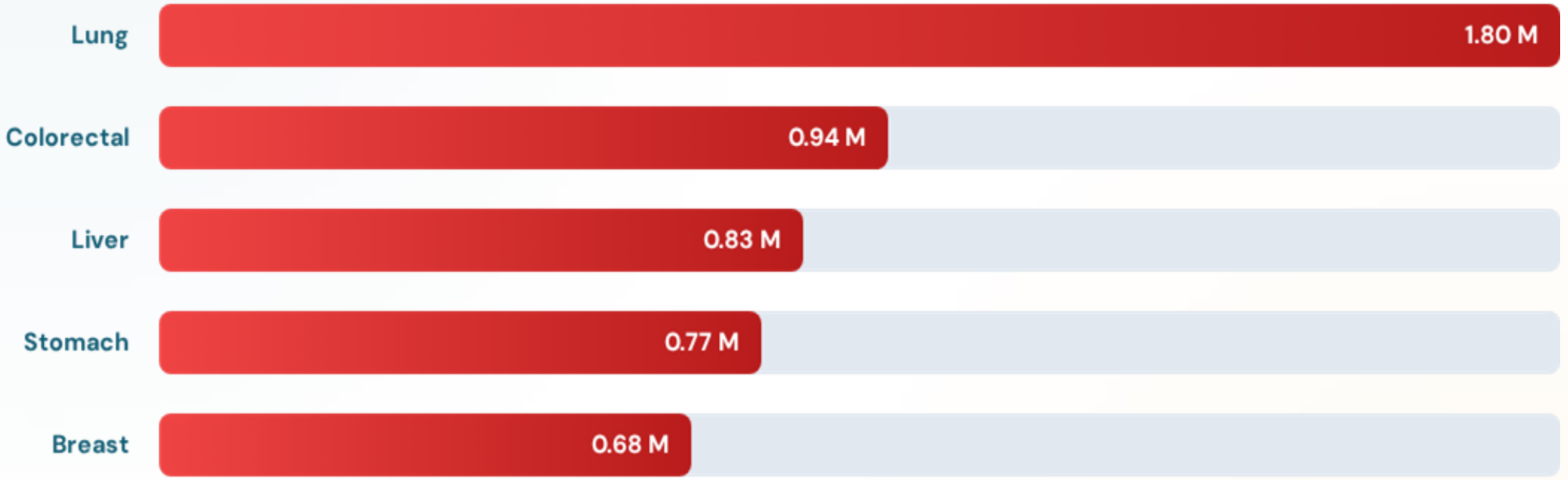
Map the end-to-end data lifecycle from case finding to quality reporting.

Global Cancer Burden: Incidence (2022)



Breast and Lung cancer account for the highest volume of new cases globally.

Global Cancer Burden: Mortality (2022)



Lung cancer dominates mortality, highlighting the need for early detection.

The Burden Summary

Incidence Insights

- ~20 million new cases annually.
- Breast cancer is the most diagnosed.
- High prevalence implies a growing need for survivorship care.

Mortality Insights

- ~9.7 million deaths annually.
- Lung cancer is the leading cause of death.
- Disparities in outcomes persist globally.

Surveillance Approaches

Type	Mechanism	Best For	Challenges
 **Passive**	Facilities submit reports	 Scale & Covenge	 Variable Quality
 **Active**	Registry staff seek data	 Completeness	 Resource Intensive
 **Syndromic**	Selected sites	 Rare Cancers	 Representatveness
 **Syndromic**	Early signals (ED/Rx)	 Early Warning	 Low Specificity

Defining the Case

ICD-O-3 Standards

The global standard for coding cancer cases.

- **Topography:** Site of origin (e.g., C50.9 Breast)
- **Morphology:** Cell type (e.g., 8500/3 Infiltrating Duct)

Reportability Rules

Determines which cases must be included in the registry.

- **Malignant (/3):** Always reportable.
- **In Situ (/2):** Most are reportable
- **Benign (/0):** Generally not, except CNS.

Staging & Rules



TNM Staging

- **T**umor size
- **N**odes involved
- **M**etastasis.

Used for clinical treatment planning



SEER Summary

- Localized
- Regional
- Distant.

Used for population-level comparison and Epidemiology



Date Rules

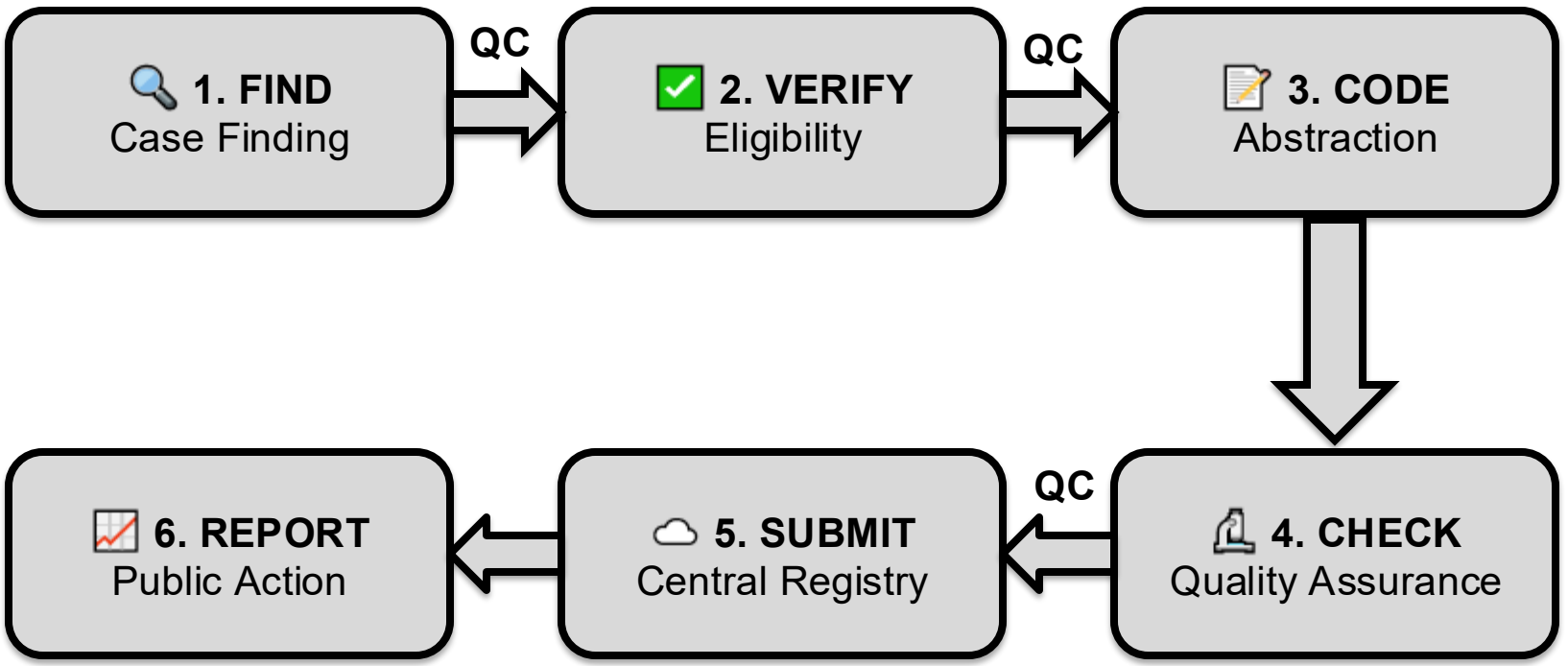
Anchor to the first definitive diagnosis (usually the pathology report date).

The Data Ecosystem

Cancer data is an aggregation of multiple streams:



Surveillance Data Workflow: The Data Lifecycle



5 Dimensions of Data Quality



Are we capturing all eligible cases?



Are standards applied uniformly over time?



Is the data correct and valid?



Is data available rapidly enough for action?



Are there duplicates in the System?

Privacy & Security Cycle

Protecting Patient Trust



RBAC: Role-Based Access Control ensures only authorized staff see data



Encryption: Data is encrypted in transit (VPN) and at rest.



Audit Logs: Every access is tracked and monitored.

Reporting Safely

Balancing usefulness and privacy in Cancer data



Small-Cell Suppression

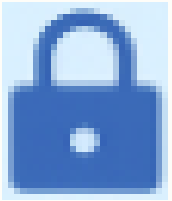
- Never publish counts fewer than <5-10 cases (follow state laws and policy).
- Combine or suppress cells to prevent re-identification in small populations



Aggregation

- Report data by larger geographic areas (e.g., region vs. zip code)
- Use multi-year aggregates (e.g., 3-5-years) to ensure statistical stability and privacy.

Goal: useful data, low disclosure risk



Questions?

Thank you for your attention

Next Steps: Complete the post-session assessment.