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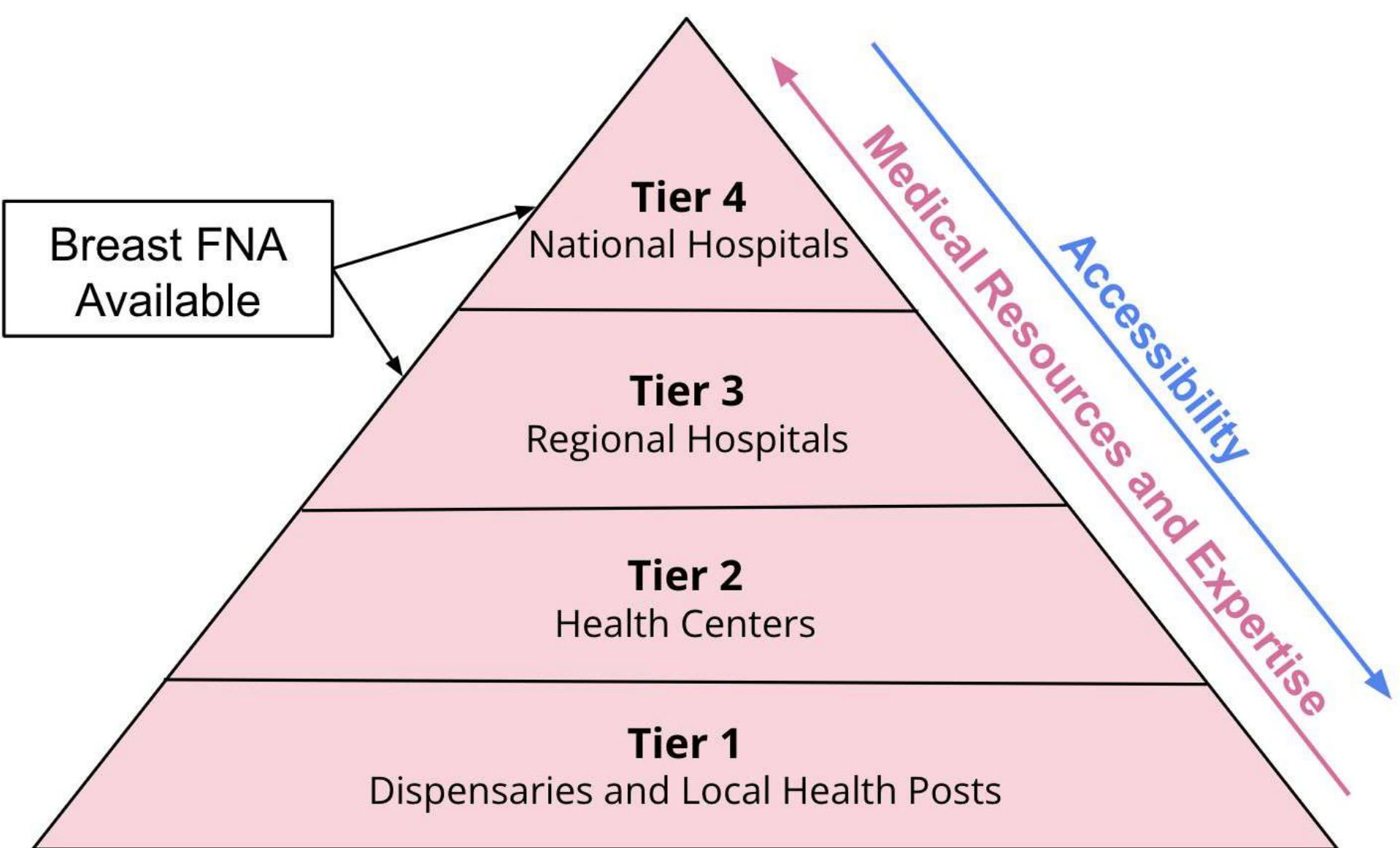
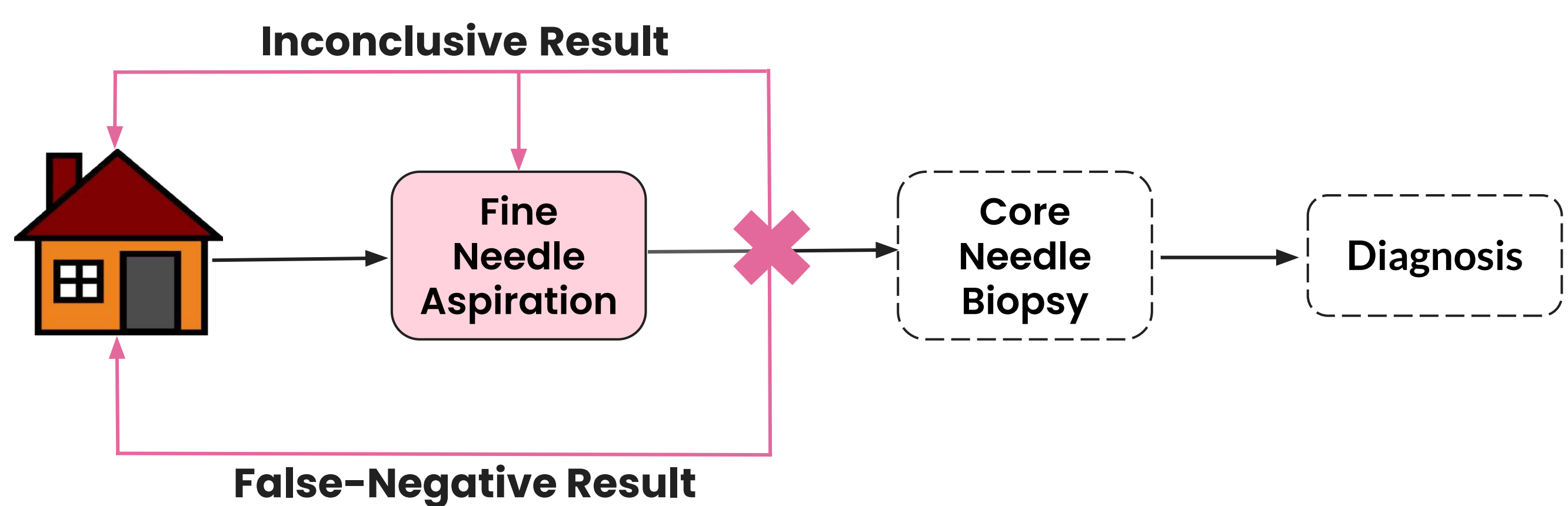
## Introduction and Background



**231,000 women** in Sub-Saharan Africa (SSA) are **at risk** of developing breast cancer annually



In SSA, **1 in 2** women with breast cancer **will die** of their condition, largely due to **late diagnosis**

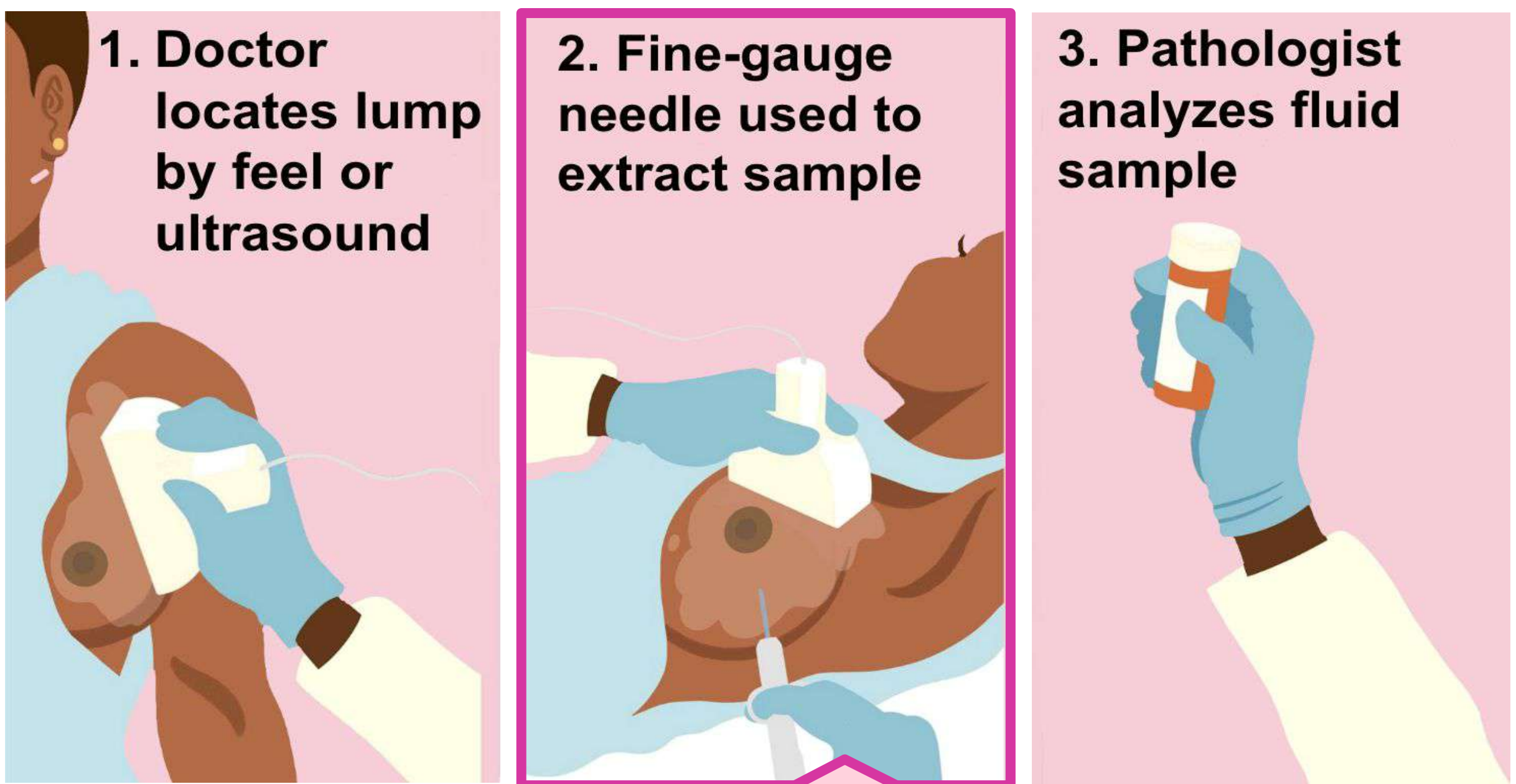


**False-Negative Rate of FNA for cancers**

**4.8–38.5%**

**Inconclusive Rate of FNA for cancers**

**20–62.6%**



Difficult to collect enough cells that enable an accurate diagnosis

## Key Objectives

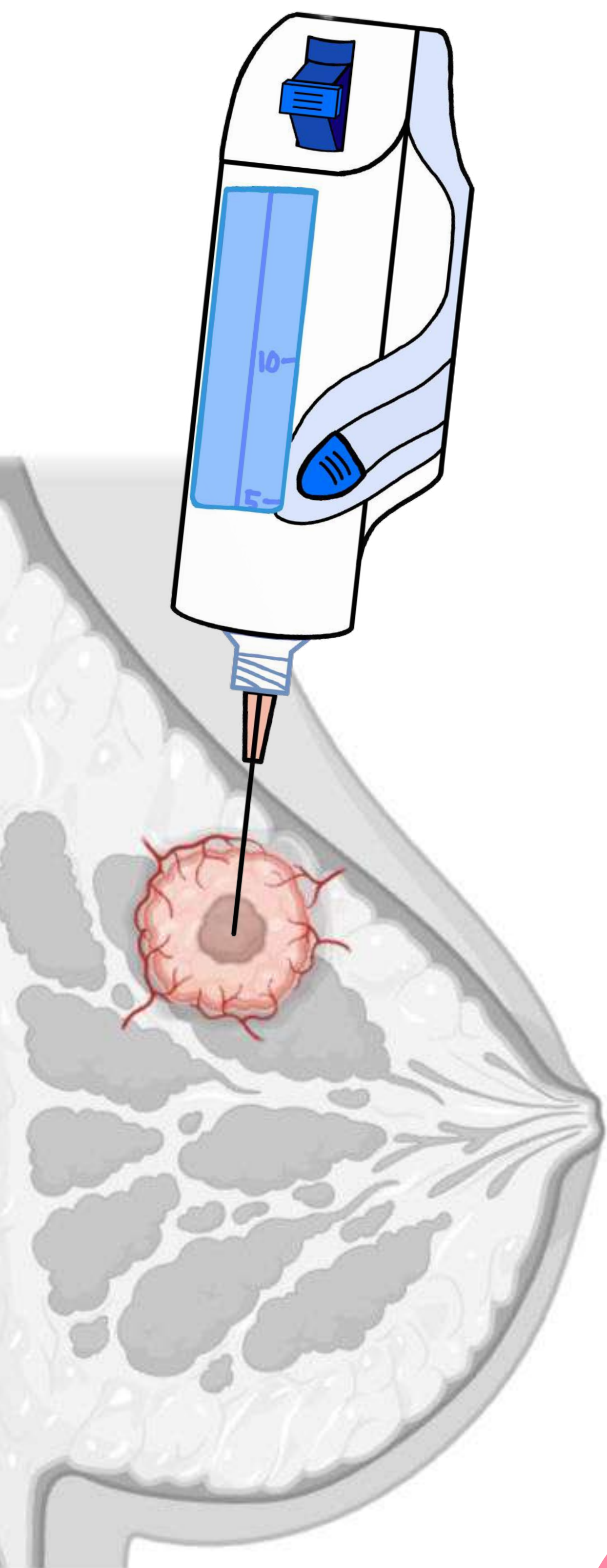
**Goal 1:** Improve the cellularity of FNA samples to enable representative diagnostic samples\*

**Goal 2:** Simplify the procedure to expand accessibility at Tier 2 Healthcare centers

**Goal 3:** Expand the use of FNA to accurately diagnose various cancers and infectious diseases

\*Representative diagnostic samples = Containing cells representative of the target lesion microenvironment that accurately reflect the health condition of the patient.

## Our Solution



**Increases Sample Cellularity**

**Cost Effective**

**Reusable**

**User Friendly**

**Minimally Invasive**

**Deskilling Potential**

## Problem Impact

**Up to 11.3 months** of treatment delay

**Tumor size doubles** every six months for invasive breast cancer

**26% increased risk of death** every 60 days of delayed treatment

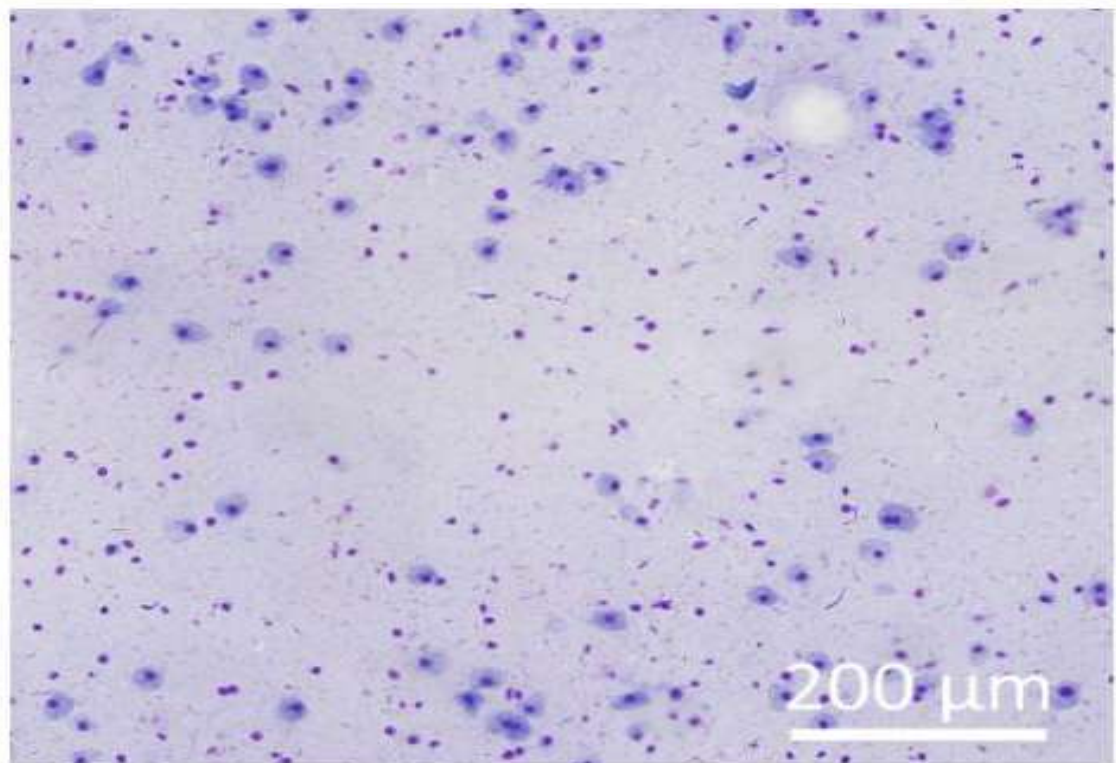
**>170 million people** in SSA live 2+ hours from the nearest Tier 3/Tier 4 hospital

## Methods

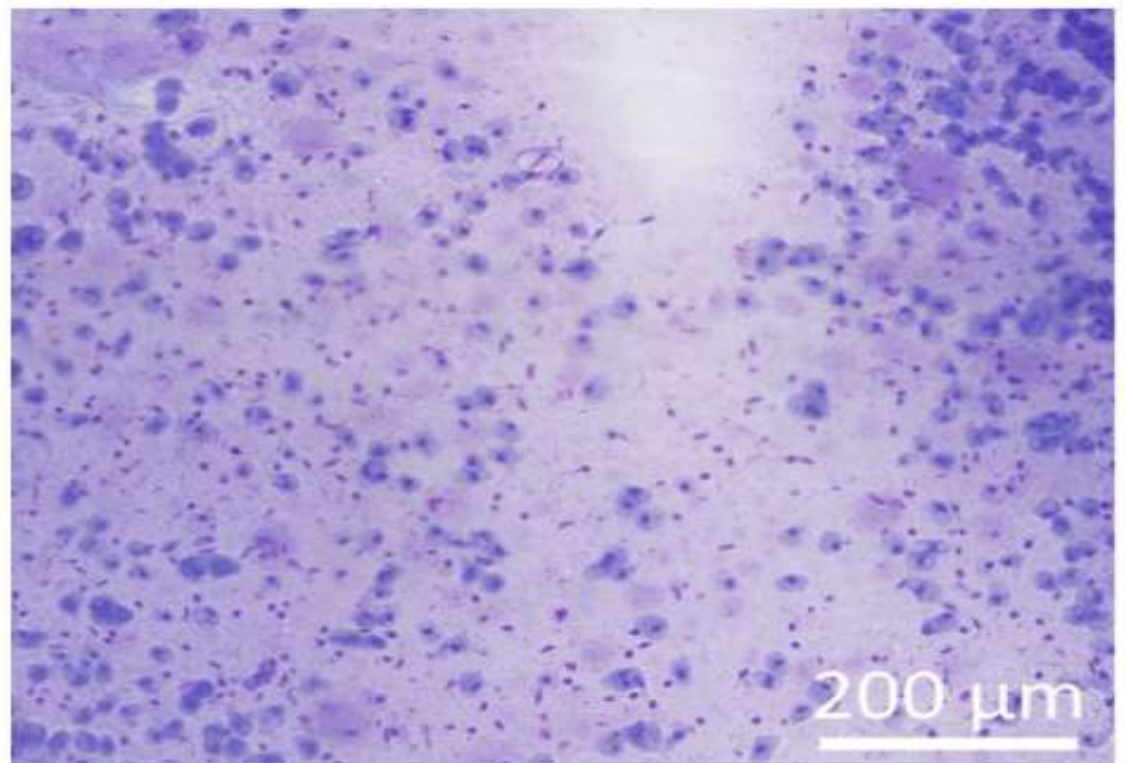
- Preliminary testing of multiple agitational motions on a goat liver model identified that a combination of linear and rotational motion is the most effective mode of agitation for increasing sample cellularity.
- Validation testing of combined linear-rotational motion showed higher sample cellularity with prototype compared to manual FNA.
- Cell quantification was performed using ImageJ Cell Counter (Fiji, v2.9.0).

## Results

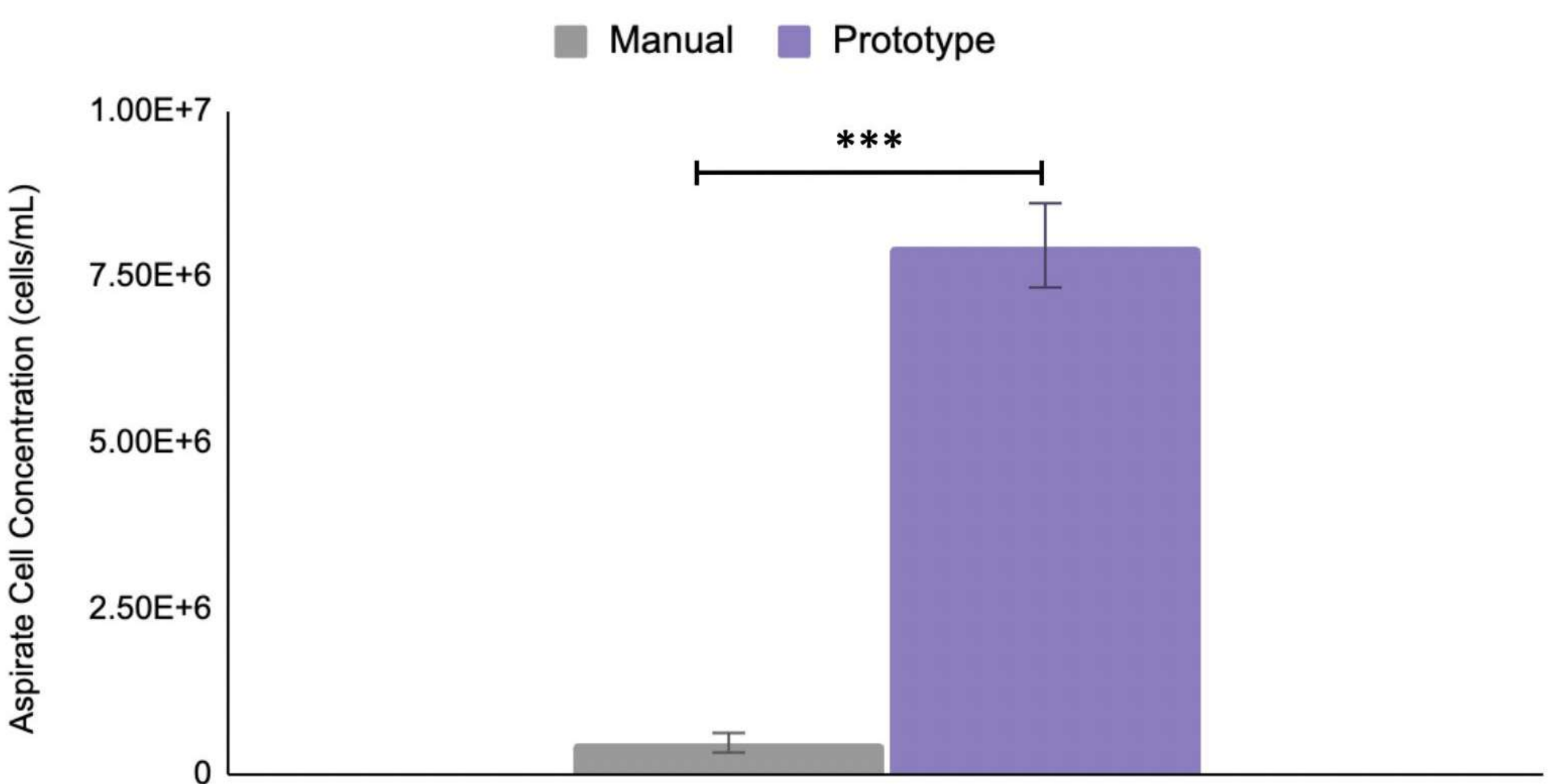
**Current Standard**



**Our Prototype**



Comparison of Aspirate Cell Concentration between Manual and Device-Assisted FNA (n=10)



## Acknowledgements

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