

## Are we flushing away our data?

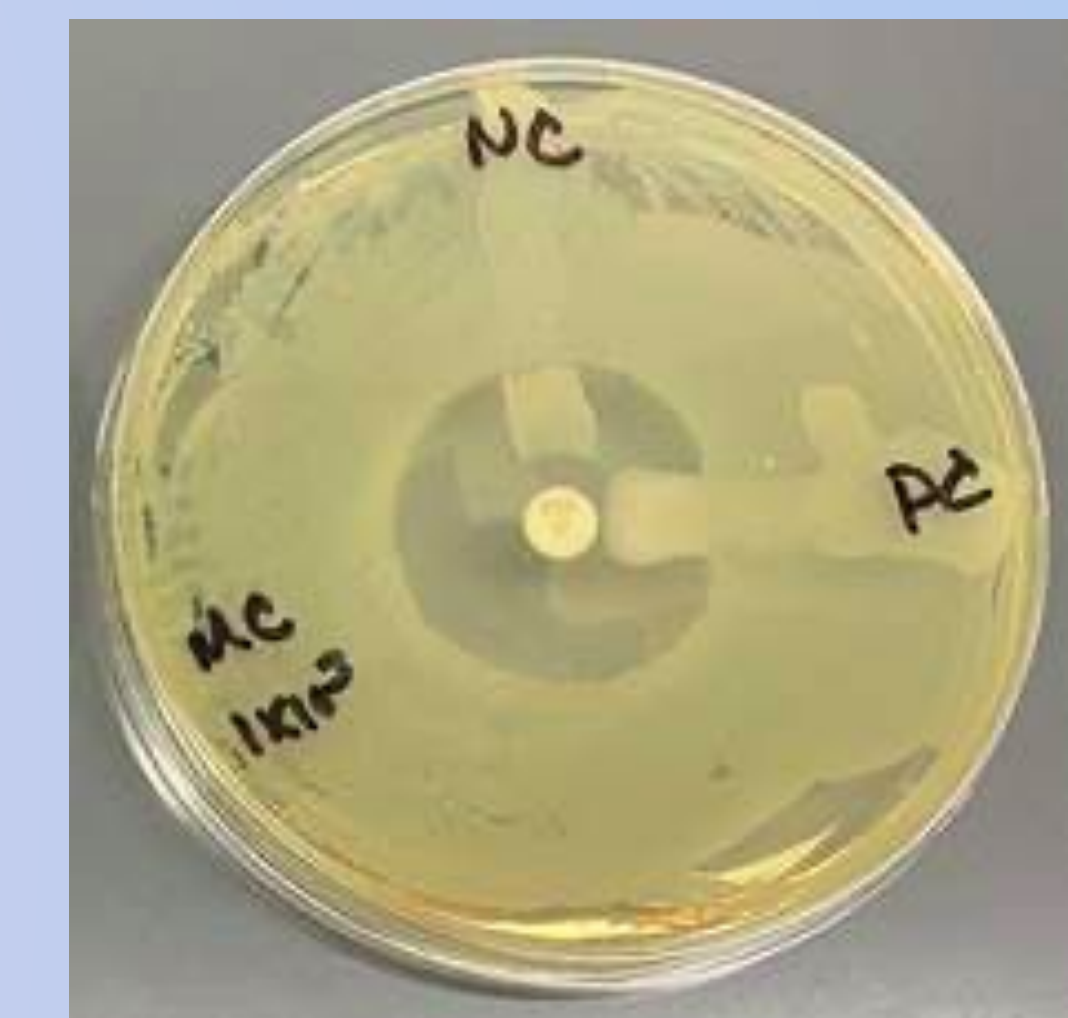
- Feces is a **strong indicator** of gastrointestinal (GI) health
- Hospital acquired infections account for an estimated **99,000 deaths annually**<sup>1</sup>
- GI diseases cost the US **\$136 billion annually** in healthcare expenditures<sup>2</sup>

*How can we design and build a smart toilet for intelligent screening of feces for gastrointestinal health and disease?*

## How are we detecting GI health and disease?

Conduct *bioanalytical* evaluation of prototype with microbiome sequencing and clinical assays.

- Modified hodge tests for presence of CRE → PCR-based methods for better accuracy



Sample with a concentration of 10<sup>3</sup> CRE/mL, a negative control, and a positive control.

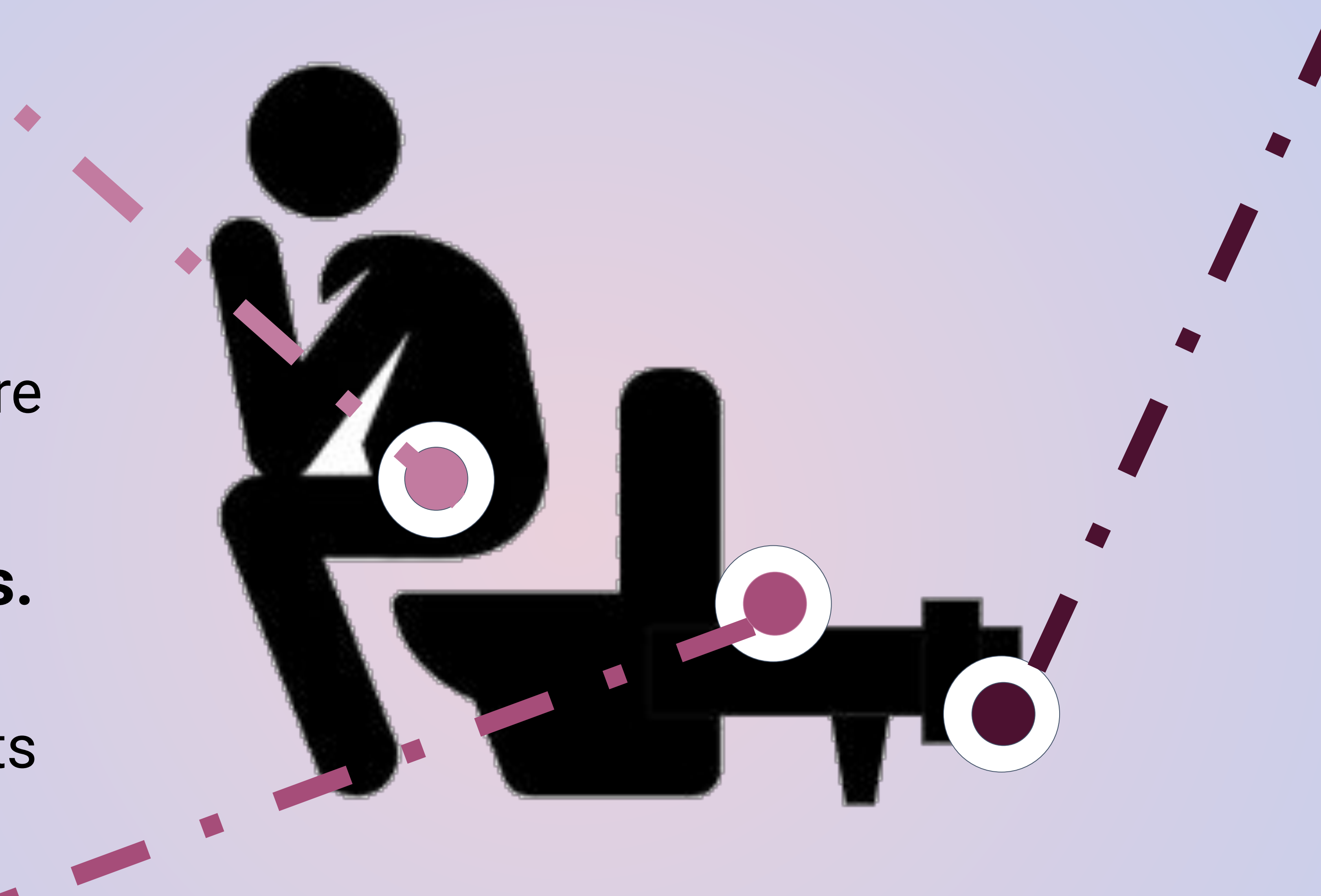
## How do we find what patients need?

Identify the most suitable market for the toilet.

- Long Term Care Facilities (LTCF) → patients are disproportionately impacted due to age

Research feces-related *public health* issues.

- Huge discrepancy between medical diagnosis and verbal description of feces by both patients and doctors



## How are we solving the problem?

Engineer a sensor system for in situ analysis & sampling mechanism for feces extraction.

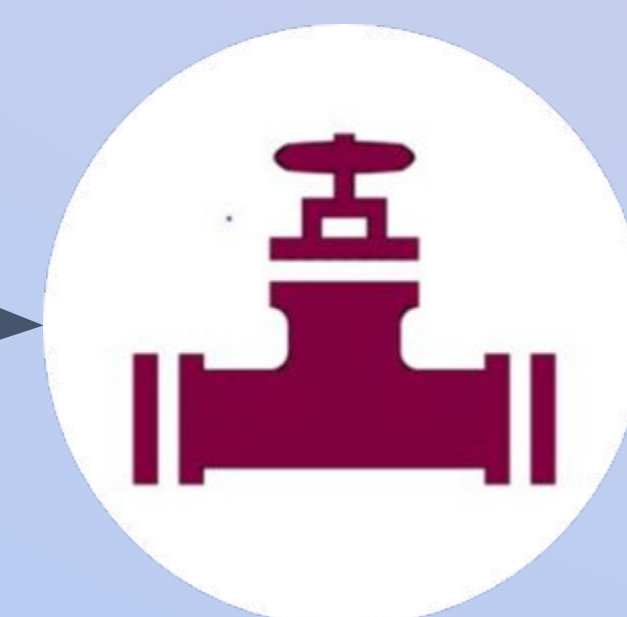


### Sensor Analytics:

Record physical and biochemical features with neural networks for intelligent fecal characterization

### Sampling Mechanism:

Collect samples of immobilized feces for further biochemical analysis



### Biochemical Analysis:

Analyze feces for HAI's, microbiome irregularities, and occult blood

## What are our next steps?

1. Prototype higher fidelity engineering models
2. Apply machine learning for fecal characterization
3. Seek pre-submission meeting with FDA