



**How can SaniPath build on the SFD's?**

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# Case Study: Vellore, Tamil Nadu, India

- Two neighborhoods:
  - Cinna Allapuram (CAP) and Old Town (OT)
- Collaboration with Christian Medical College, Vellore, India and MAL-ED study



# Study Objectives

- Objective 1: To understand the dominant pathways of exposure to fecal contamination in two neighborhoods of Vellore, India.
  - Part 1: SaniPath Tool Deployment
- Objective 2: To quantify the associations between household toilets and fecal sludge management (FSM) with fecal contamination in different urban contexts
  - Part 2: Creating SFDs from SaniPath Data
  - Part 3: Extended SaniPath data collection and Spatial Analysis

# Part 1: Deployment of the SaniPath Tool

- Systematic, customizable method to collect relevant data on exposure to fecal contamination
- Help guide decision-making and advocacy surrounding urban sanitation
- Synthesize data using open-source software package

# SaniPath Field Methods

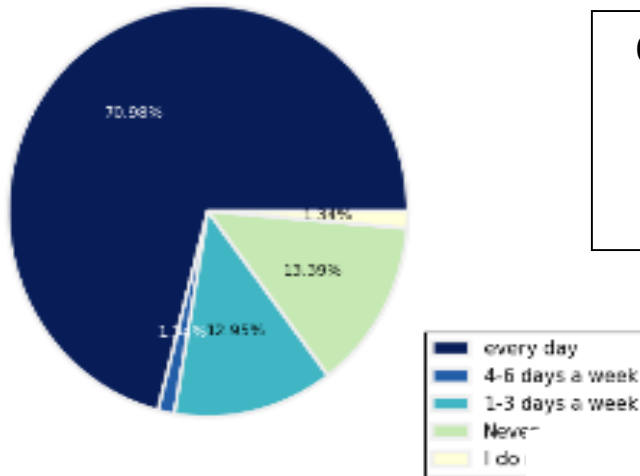
- Environmental Samples
  - 10 public area samples/ neighborhood, 25 HH samples
- Behavioral Surveys
  - Household surveys (100/neighborhood), School Surveys (4/neighborhood), community surveys (4/neighborhood)
- GPS data



# SaniPath Tool Exposure Assessment Analysis

## Behavior Frequency

Frequency of Municipal Drinking Water Contact  
in Shaibu (adults)



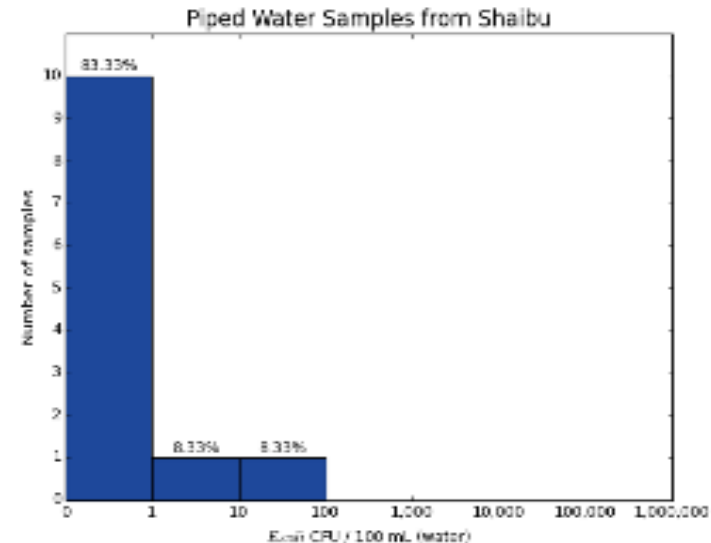
Tool uses Bayesian analysis to estimate the distribution of environmental contamination and frequency of exposure.

Other parameters:  
intake volumes,  
duration of  
exposure, etc.

**Piped Water (Adult)**  
Percent Exposed = 89%  
Log10 Dose 3.1



## Environmental Contamination

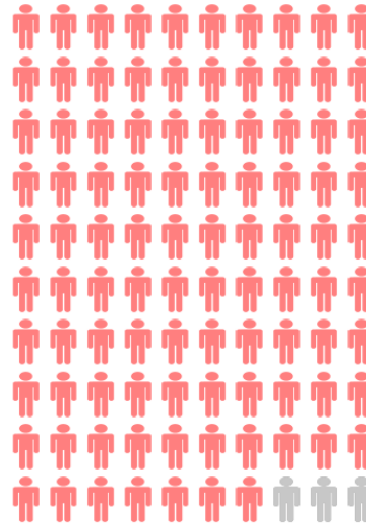


The mean dose and proportion of the population exposed are summarized from simulated distributions and displayed in risk profiles (left).

Tool results from CAP →

Tool results from OT ↓

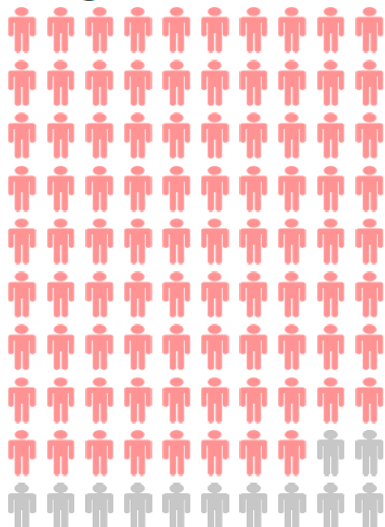
Piped Water Adults  
Percent Exposed = 97 %  
Log10 Dose= 4.95



Drain Water Adults  
Percent Exposed = 57 %  
Log10 Dose= 3.78



Piped Water Adults  
Percent Exposed = 88 %  
Log10 Dose= 4.25

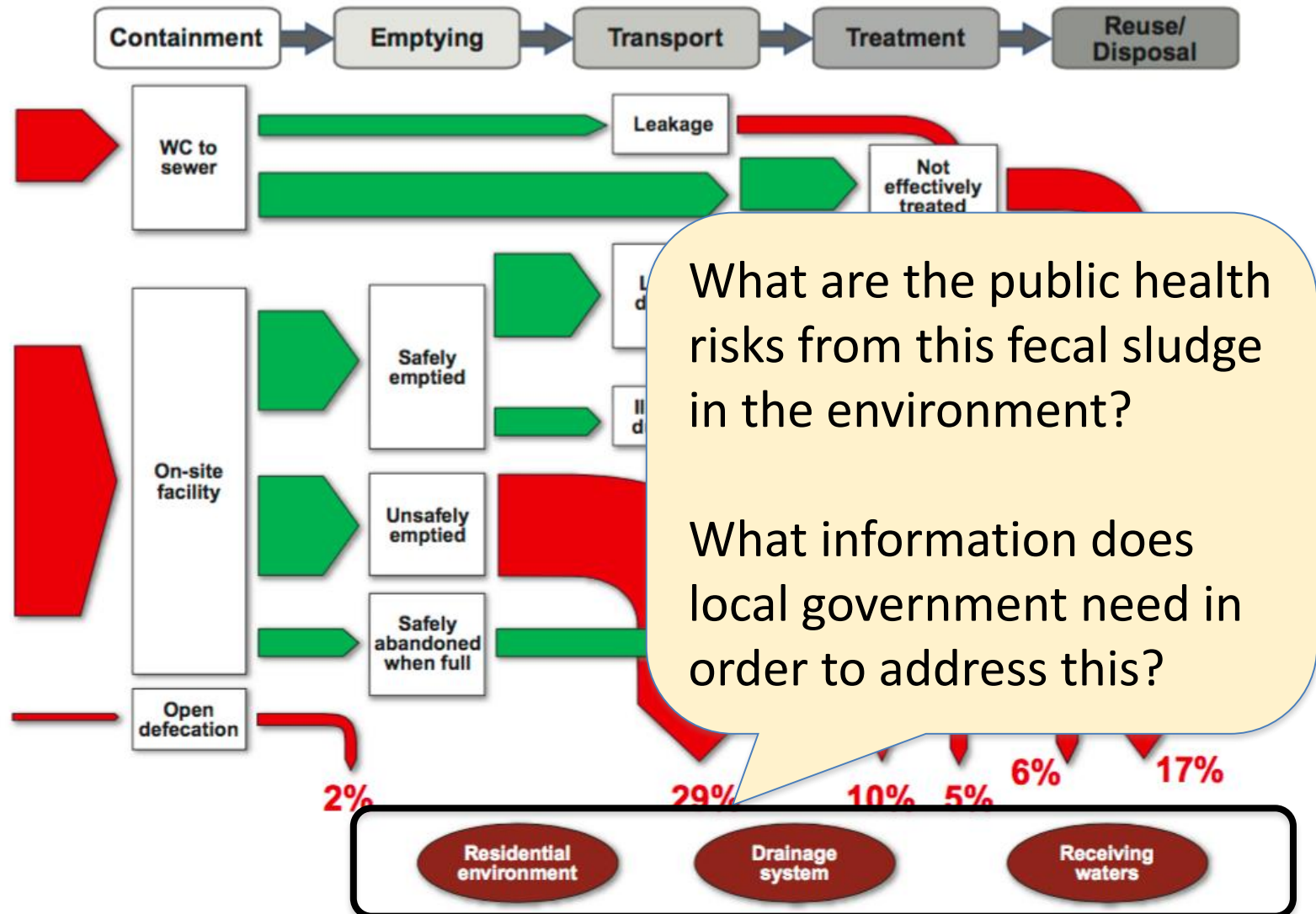


Drain Water Adults  
Percent Exposed = 76 %  
Log10 Dose= 4.1

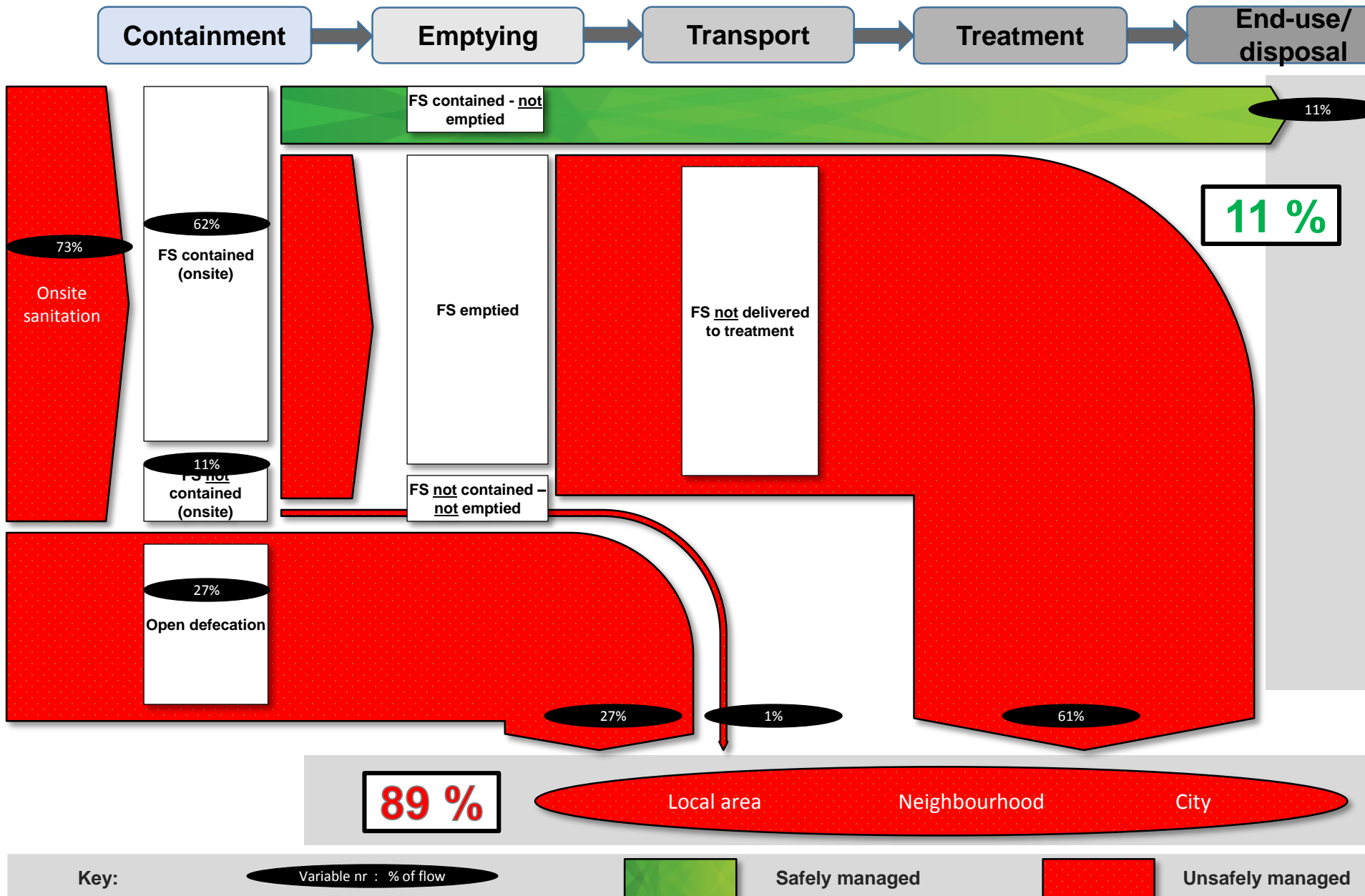


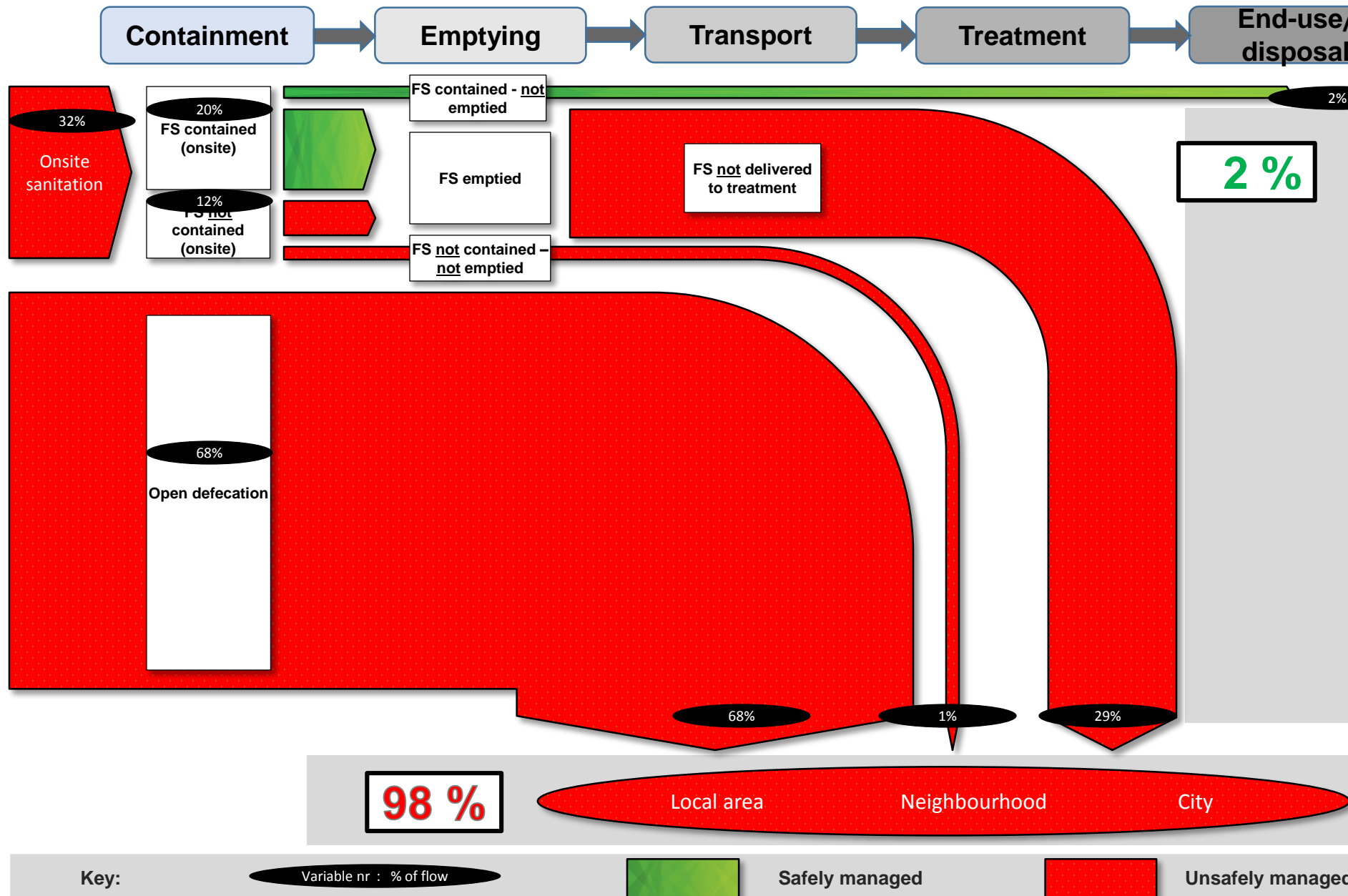
- Municipal piped drinking water and drain water posed the highest risks of exposure of adults and children living in CAP and Old Town

## Part 2: Building Shit Flows Diagrams









# Part 3: Spatial Analysis

- Kulldorff's Bernoulli Spatial Scan
- Microbial concentrations in environmental samples (outcome) and household survey characteristics (predictors) assessed for spatial clustering

# Summary Points

- The SaniPath Deployment showed Piped Drinking Water and Open Drains posed the highest risk of exposure in CAP and Old Town
- The SFDs showed that estimated household toilet coverage: 73% (CAP) vs. 32% (OT); estimated proportion of safely-managed excreta: 11% (CAP) vs. 2% (OT)
- Additional spatial analysis showed that areas with higher coverage of toilets and poor FSM had more pathogens in drains

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# Thank You

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