SaniPath Tool Results

Exposure to Fecal Contamination in 3 Low-Income Urban Settings

Suraja Raj, MPH

Emory University
Risk of Exposure
Which pathways pose the greatest risk of exposure?

- Flood zones
- Household
- Food
- Surface Waters
- Open drains
- Public latrines
- Municipal Water
- Soil
Overview
The SaniPath Exposure Assessment Tool

• Assesses relative public health risks related to poor sanitation and FSM

• Guides data collection & analysis

• Can help prioritize programs and policy
Methods
SaniPath Field and Analysis Methods

• Field Work
  • Environmental Samples
  • Behavioral Surveys
  • GPS data

• Lab
  • Test samples for *E. coli*

• Analysis
  • Estimates % population exposed and mean dose
SaniPath Results

People plots show variation across pathways within a neighborhood

- Piped Water Adults
  - % Exposed: 88%
  - Log10 Dose: 4.3

- Drain Water Adults
  - % Exposed: 76%
  - Log10 Dose: 4.1

- Bathing Water Adults
  - % Exposed: 100%
  - Log10 Dose: 1.7

- Produce Adults
  - % Exposed: 65%
  - Log10 Dose: 6.6

- Public Latrines Adults
  - % Exposed: 54%
  - Log10 Dose: 4.1
Research Questions

• How consistent are the results of a SaniPath exposure assessment?
• How do fecal exposure pathways vary across neighborhoods in different cities?
Question 1
Examining the Consistency of SaniPath Results

1. Is the risk ranking of pathways similar?
2. Are the risk estimates similar (percent of exposed population and magnitude of exposure)?
3. If different, where are the differences and why?
Comparing Simultaneous Parallel Deployments

Two teams collect data simultaneously in Chorkor, Accra, Ghana

Team 1

- Drain
  - Percent Exposed = 72 %
  - Log10 Dose= 7.07

- Produce
  - Percent Exposed = 92 %
  - Log10 Dose= 7

- Piped Water
  - Percent Exposed = 67 %
  - Log10 Dose= 5.17

- Public Latrine Surface
  - Percent Exposed = 89 %
  - Log10 Dose= 1.88

Team 2

- Drain
  - Percent Exposed = 72 %
  - Log10 Dose= 6.32

- Produce
  - Percent Exposed = 97 %
  - Log10 Dose= 6.77

- Piped Water
  - Percent Exposed = 78 %
  - Log10 Dose= 5.16

- Public Latrine Surface
  - Percent Exposed = 83 %
  - Log10 Dose= 1.87

Results look nearly identical—suggesting good consistency
Comparing Deployments from Two Different Years
Comparing 2012 and 2016 results for pathways in Shiabu, Accra, Ghana

Risk profiles for drains are different
Other risk profiles are nearly identical
E. coli concentrations in drain samples were at upper limit of detection in 2012.

Dilutions of drain samples were adjusted in 2016 and E. coli concentrations were quantified more accurately.
Question 2
Three pathways, three cities

Greatest variability was in drain pathway.

Moderate fecal contamination but high % exposed to drinking water

Produce is consistently highly contaminated, but % exposed population varies by city
Question 2
Drains in Accra, Vellore, and Maputo
Summary

• Fecal contamination varies across pathways in a single neighborhood
• Good consistency in risk profiles
• Exposure to fecal contamination varies across pathways for 3 different cities

Information on geographic and pathway differences can be used:

1. For **advocacy** to raise awareness about the risks from poor sanitation and FSM
2. To **target investments** to areas/pathways of greatest risk.
Acknowledgements

Bill & Melinda Gates Foundation
TREND
Water Research Institute, Ghana
Christian Medical College, Vellore
Georgia Tech (MapSan study)
WeConsult
Laboratório Nacional de Higiene de Águas e Alimentos (LNHAA)
Study Communities
Center for Global Safe Water, Sanitation and Hygiene at Emory University
Christine Moe, Amy Kirby, Yuke Wang, Kate Robb, Suraja Raj, Habib Yakubu, David Berendes, Jamie Green, James Michiel, Eddy Perez, Students
Thank You

For more information visit SaniPath.org

@SaniPath

Suraja Raj, MPH
sraj@emory.edu