



Using an evidence based decision making process to guide sanitation investments in low resource communities-The SaniPath tool- A case study of Accra, Ghana

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Leading and
Learning in WASH

Panel Members

- Samuel Tete – Deputy Director, AMA Public Health Department
- Samuel Nii Armah Turkson- Community Leader, Adabraka
- Dr. Joseph Ampofo- Director, Water Research Institute of CSIR
- Dr. Benjamin Doe – TREND Group
- Habib Yakubu – Center for Global Safe WASH, Emory University

Background : Global Sanitation

In **2008**, for the first time in history, the number of people living in cities **outnumbered** the population in rural areas

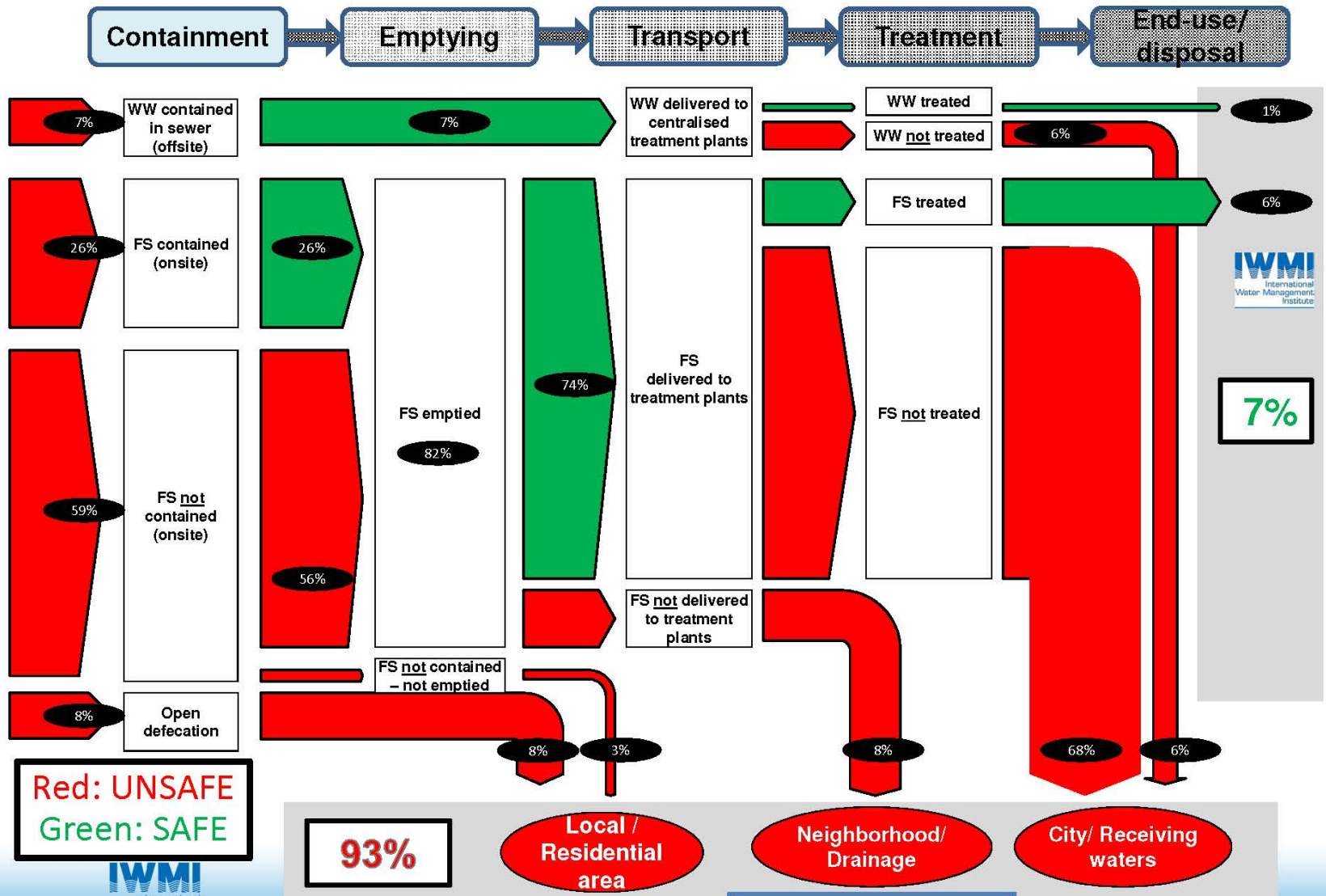


By **2050** the United Nations projects that **65%** of global population will live in cities

Rapid growth **outpaced** the ability of government to provide **basic** services



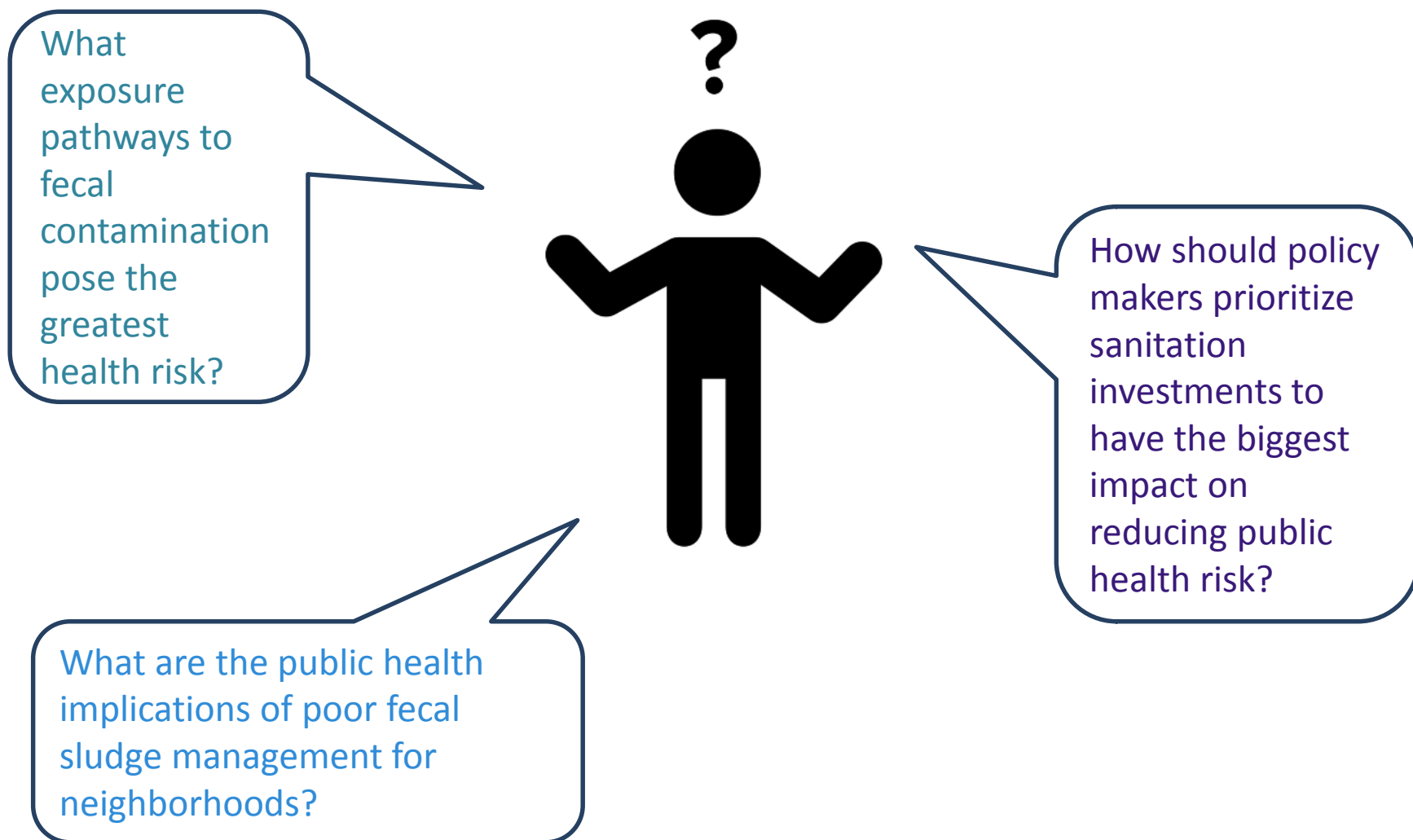
EXCRETA FLOW DIAGRAM: GREATER ACCRA, YEAR 2010





Given complex exposure routes with different levels of contamination and type of exposure contact, it has been difficult to determine what kind of interventions might have the biggest impact on reduction in exposure.

Local governments and development partners lack evidence-based tools to assess relative public health risks from fecal contamination





The SaniPath Rapid Assessment Tool is designed to assess public health risks related to poor sanitation and to help prioritize sanitation investments based on the exposures that have the greatest public health impact.



SaniPath

Rapid Assessment Tool

- **Based on in-depth risk assessment** in Accra, Ghana
- **Systematic, customizable method** to collect relevant data on exposure to fecal contamination in low-income, urban neighborhoods
- Designed for use by community, government, and development partners to help guide **decision-making** and **advocacy** surrounding urban sanitation
- **Synthesize data** using open-source software package
- Tool has been used in Accra, Ghana; Vellore, India; Maputo, Mozambique

Pathways of Exposure to Fecal Contamination in the Urban Environment



Floodwater



Public latrines



Soil in public areas



Surface water



Public drinking and bathing water



Wastewater irrigated produce



Open drains

SaniPath Data Collection Methods

- **Behavioral Exposure Data**

- Collect survey data on reported frequency of behavior of adults and children that leads to exposure to fecal contamination



Conducting a group survey in a school

- **Environmental Microbiology Data**

- Collect environmental samples from relevant exposure pathways
- Analyze for *E. coli*



Collecting drain water samples

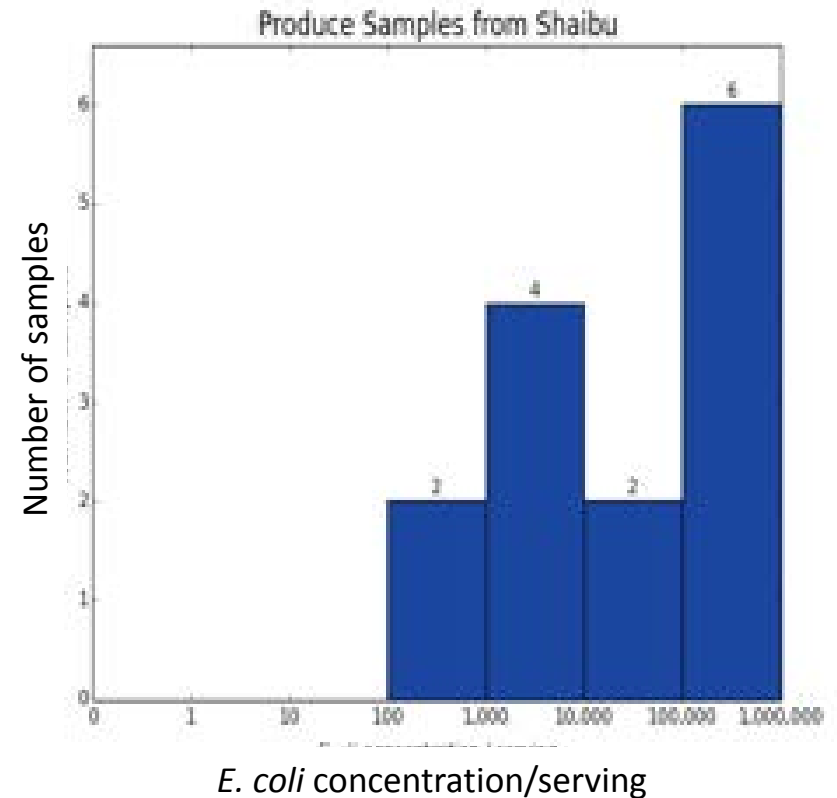
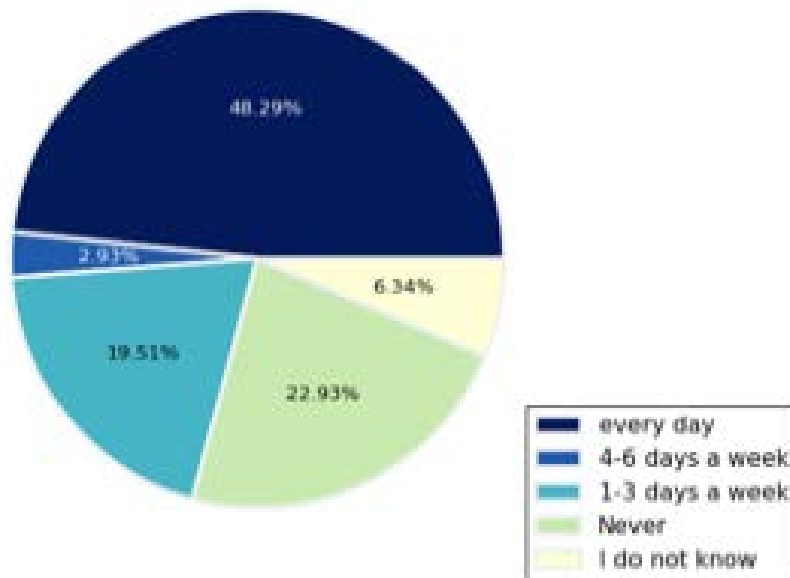


Analyzing environmental samples using membrane filtration

- **Data are combined assess the relative risk of exposure.**

SaniPath Rapid Assessment Tool Outputs

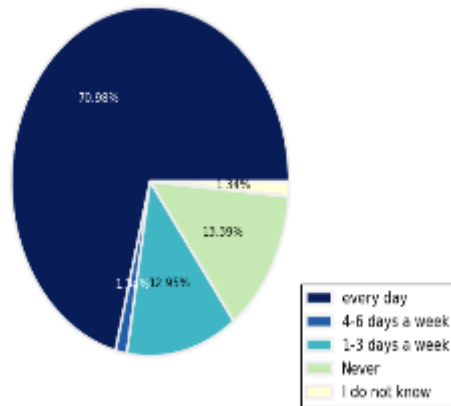
Frequency of Fruits/Vegetables Contact
in Shaibu (children)



Behavioral and environmental data are combined to estimate exposure to fecal contamination via specific pathways

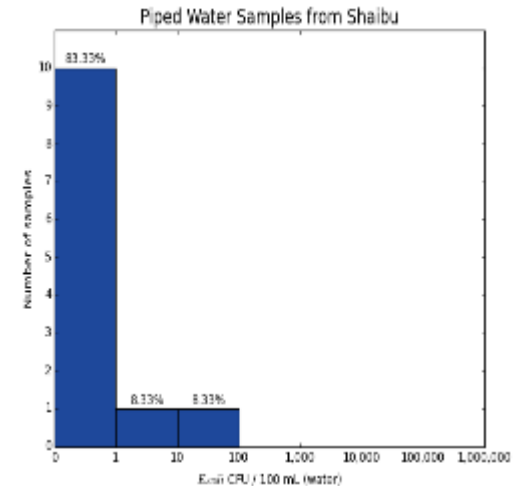
Behavior Frequency

Frequency of Municipal Drinking Water Contact in Shaibu (adults)



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

Environmental Contamination



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



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

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

SaniPath Risk Profiles

Neighborhood in Accra, Ghana

Drinking Water (Adult)

Percent Exposed = 89%

Log10 Dose 3.1



Neighborhood in Vellore, India

Drinking Water (Adult)

Percent Exposed = 97%

Log10 Dose 4.95



Risk profiles show % of population exposed per month (in red) and the average dose of fecal contamination ingested per month (darker red = higher dose).

Open Drains

Shiabu Adult drain
Percent Exposed = 33 %
Log10 Dose= 2.88



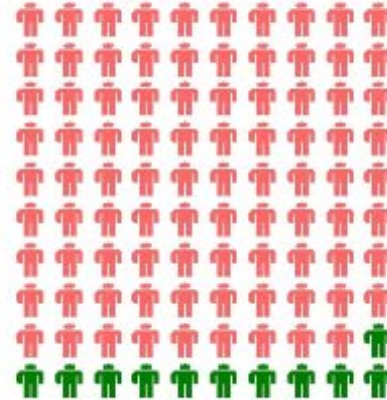
Drinking Water

Shiabu Adult drinking water
Percent Exposed = 71 %
Log10 Dose= 2.41



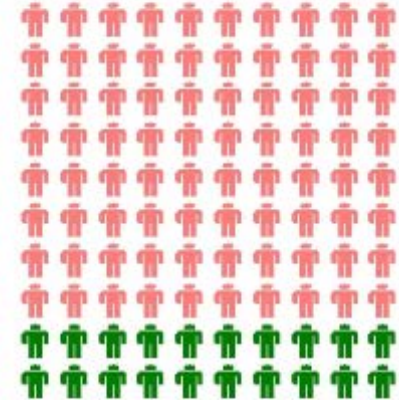
Raw Produce

Shiabu Adult produce
Percent Exposed = 89 %
Log10 Dose= 5.94



Public Latrine Surfaces

Shiabu Adult swabs
Percent Exposed = 80 %
Log10 Dose= 5.13



Adults

Shiabu Child drain
Percent Exposed = 17 %
Log10 Dose= 3.9



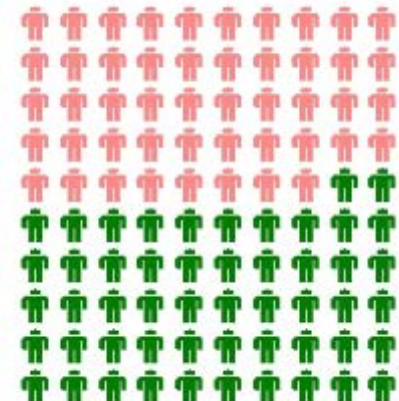
Shiabu Child drinking water
Percent Exposed = 57 %
Log10 Dose= 2.15



Shiabu Child produce
Percent Exposed = 55 %
Log10 Dose= 5.42



Shiabu Child swabs
Percent Exposed = 48 %
Log10 Dose= 4.56



Children

Adults

Open Drains

All Neighborhood: Adabraka
Drain Water Adults
Percent Exposed = 57 %
Log10 Dose= 4.92



Produce

All Neighborhood: Adabra
Produce Adults
Percent Exposed = 95 %
Log10 Dose= 5.98



Piped Water

All Neighborhood: Adabraka
Piped Water Adults
Percent Exposed = 57 %
Log10 Dose= 2.39



Flood Water

All Neighborhood: Adabraka
Flood Water Adults
Percent Exposed = 59 %
Log10 Dose= 2.78



Children

All Neighborhood: Adabraka
Drain Water Children
Percent Exposed = 69 %
Log10 Dose= 6.87



All Neighborhood: Adabra
Produce Children
Percent Exposed = 83 %
Log10 Dose= 5.31



All Neighborhood: Adabraka
Piped Water Children
Percent Exposed = 88 %
Log10 Dose= 1.93



All Neighborhood: Adabraka
Flood Water Children
Percent Exposed = 73 %
Log10 Dose= 4



Summary of SaniPath Rapid Assessment Tool Goals:

- **Guide** users through the collection of relevant data to estimate the relative public health risk
- **Provide** users with easy-to-use software interface for data collection that can be customized to fit the country context
- **Synthesize** these data to guide community, government, and service providers in their decision-making process
- **Limitations:**
 - Currently designed for use a neighborhood level, city level design process underway
 - Does not measure health outcomes





SaniPath Next Steps

- Adapt tool to optimize user interface and output
- Identify candidate cities for tool deployment where sanitation interventions are being considered

Acknowledgements



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Thank You

For more information and to
download the tool visit
SaniPath.com

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