

# Water Quality Testing

## Practical Experiences

Maximilian Hirn, 30-Sept-2016



**WORLD BANK GROUP**  
Water

# Monrovia (Liberia)

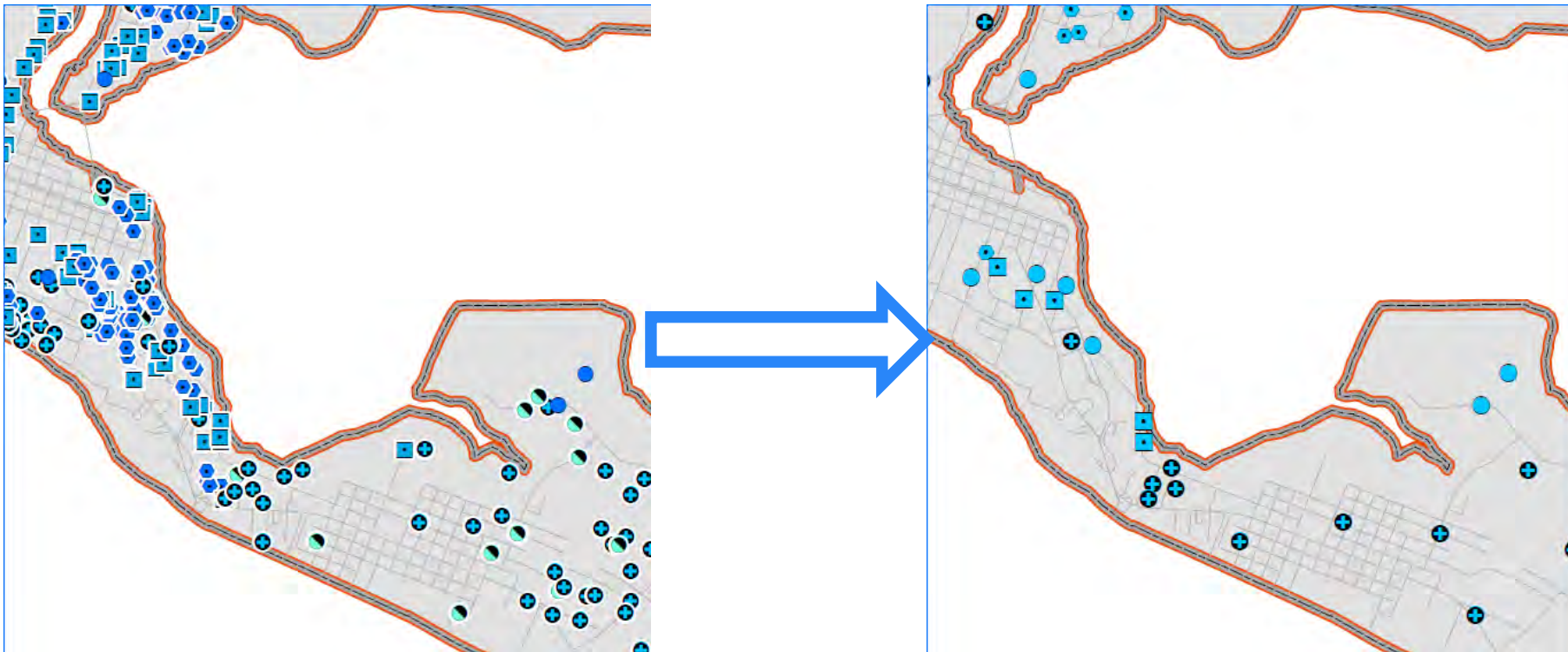
**Even the few with access to piped water receive dubious service**



# Monrovia (Liberia)

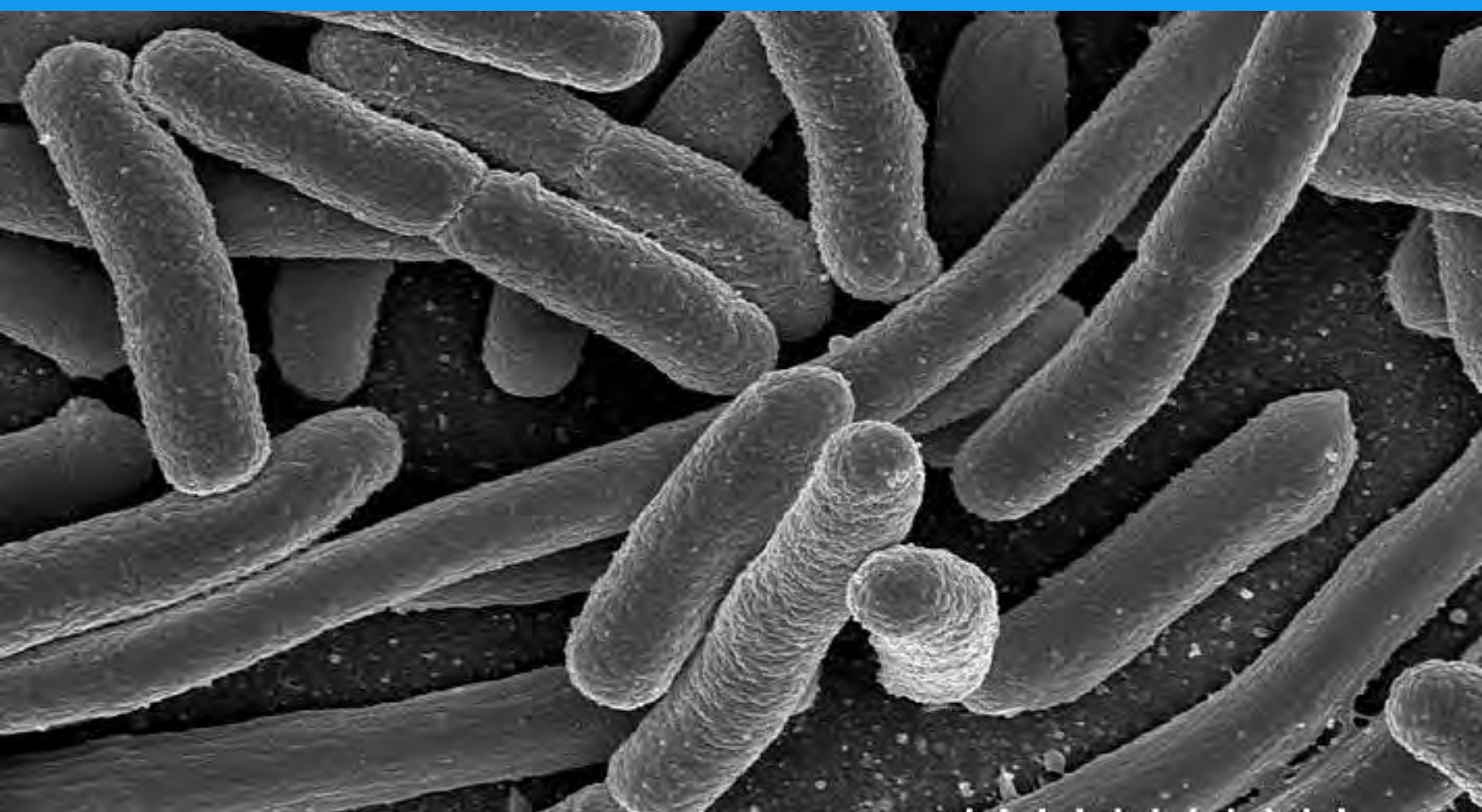
We wanted to know – how bad is it?

Random Sample of 204 waterpoints





# Monrovia (Liberia)



Total Coliform	0	175	0	175
<i>E. coli</i>	0	117	0	117

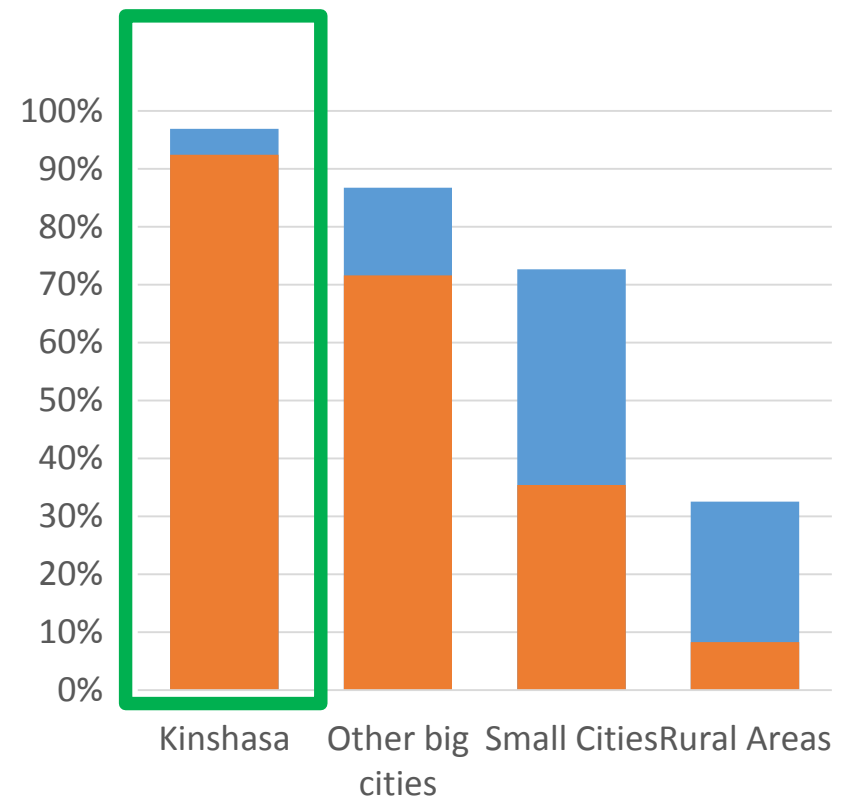
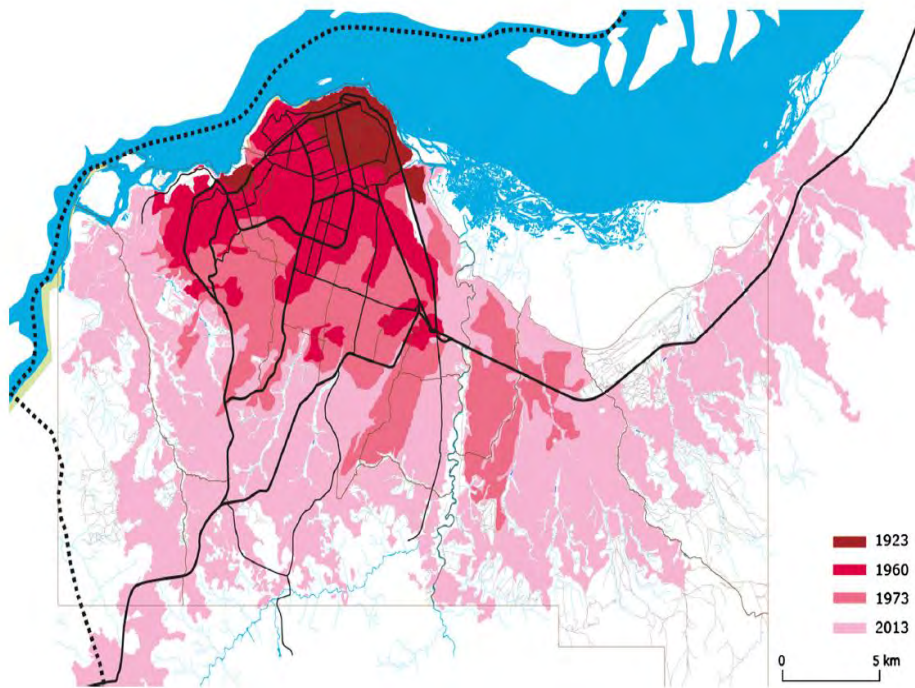
# Monrovia (Liberia)

**58% of all tested points contaminated with E Coli**

Point Type	E. Coli Contamination
Unprotected hand-dug wells	100%
Kiosks	75%
LWSC City water taps	67%
Protected hand-dug wells (handpumps)	52%
Drilled wells with hand-pumps	44%

# Kinshasa (DR Congo)

A rapidly growing city with surprisingly high piped water supply



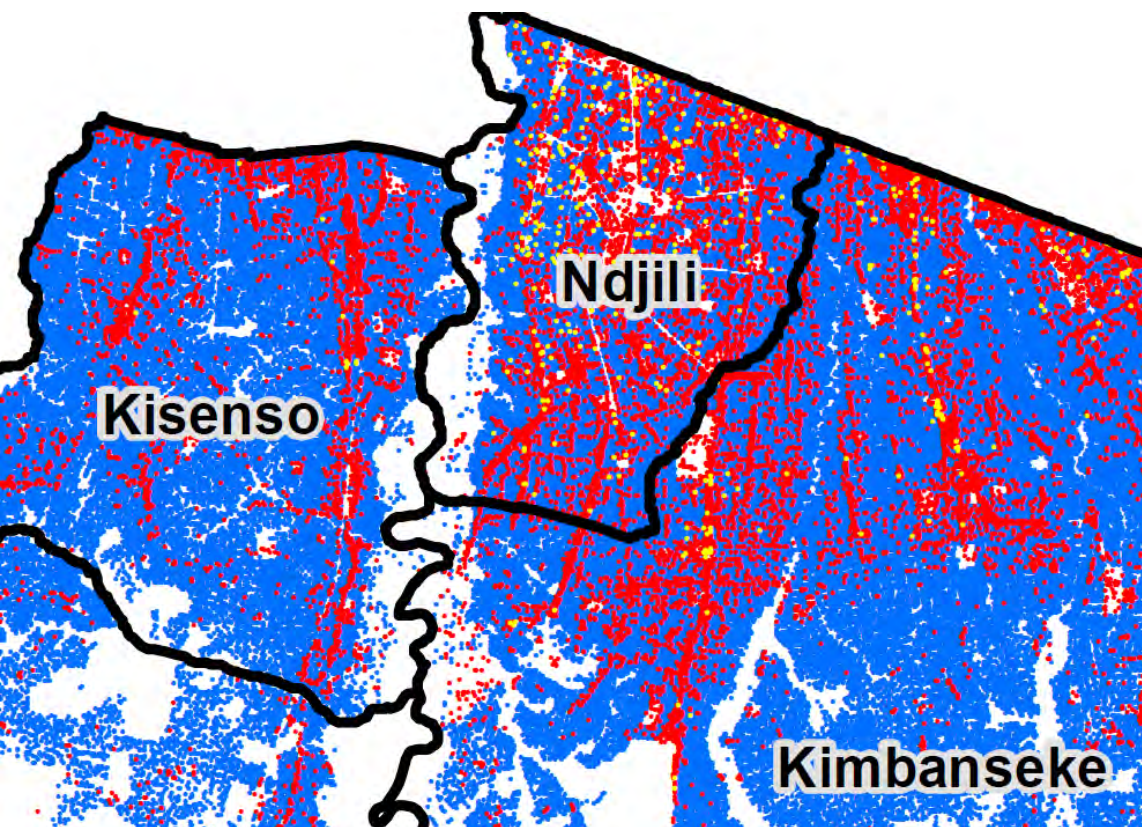
■ Access to improved water (%) ■ Piped water (%)



# Kinshasa (DR Congo)

We wanted to know –really this good & does it vary within city?

Random Sample of 1800 households in selected communes



# Kinshasa (DR Congo)

**We wanted to know – really this good & does it vary within city?**

**It is not & varies greatly**

Commune	% of Household's Using E.Coli Contaminated Water
N'Djili	11%
Kasa-Vubu	13%
Makala	16%
Kinshasa	20%
Kimbanseke	32%
Mont Ngafula	37%
Kisenso	38%



# Kinshasa (DR Congo)


**VOA** Voice of America

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September 02, 2016 3:04 PM Lisa Schlein

## Emergency Cholera Vaccination Campaign Set to Begin in DRC

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Kinshasa, Democratic Republic of Congo

GENEVA — The World Health Organization says it is alarmed at the quick spread of a cholera epidemic in the Democratic Republic of Congo (DRC) and is taking emergency measures to halt its spread.

Highly endemic in the DRC, the deadly cholera epidemic appears to be moving with unusual speed, according to a recent WHO report that says a vaccination campaign is set to begin in the capital, Kinshasa in a couple of weeks.

According to the report, an estimated 18,000 cases have been reported in the country this year — practically the same number of cholera cases recorded for all of 2015.

Of even greater concern is the spread of the disease from the eastern part of the country, where it is normally limited, to Kinshasa, which is usually cholera-free.

Dominique Legros, head of the WHO's Department for Pandemic and Epidemic Diseases, says 2011 was the last time any cases were reported in Kinshasa. That outbreak, he said, lasted almost two years with more than 2,000 cases and 88 deaths.

**Related**

- UN: 323 Million at Risk of Disease From Dirty Water
- More Africa Stories
- US Orders Families of Government Personnel to Leave Troubled DRC
- Security Efforts, Dialogue Go Hand in Hand in C.A.R., UN Mission Says
- Cabon Opposition Leader Calls Supporters to 'Active Resistance'

## VoiceOfAmerica, September 2016:

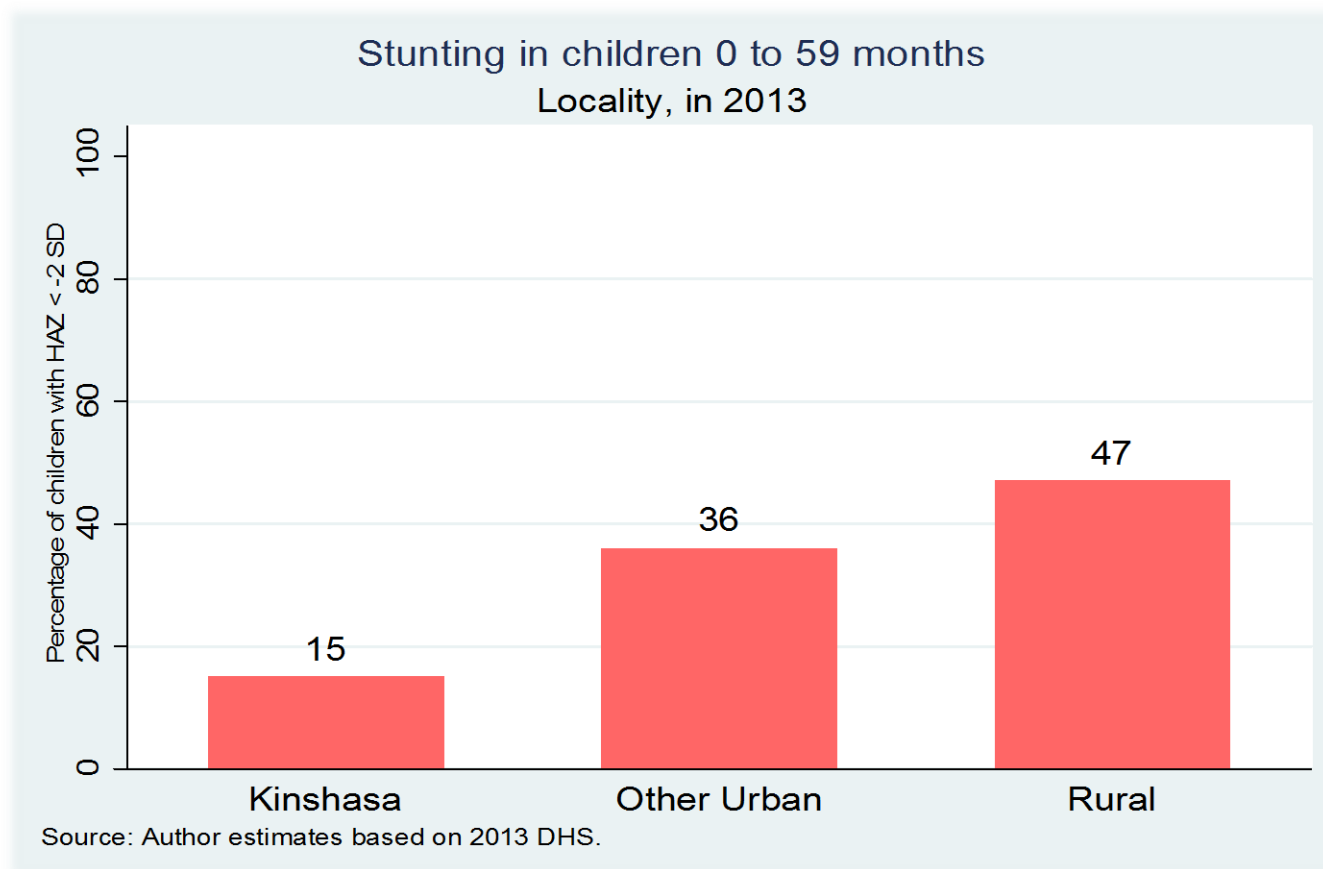
**“Highly endemic in the DRC, the deadly Cholera epidemic appears to be moving With unusual speed...an estimated 18,000 cases have been reported [>500 dead]...**

**Of even greater concern is the spread of the disease...to Kinshasa, which is usually cholera-free...**

**“That is very worrisome because it affects places where there are usually no cases of cholera, no immunity of the population,” he said. “The health staff is not used to cholera cases ... and the additional concern we have for Kinshasa is that the rainy season is coming...**

# Kinshasa (DR Congo)

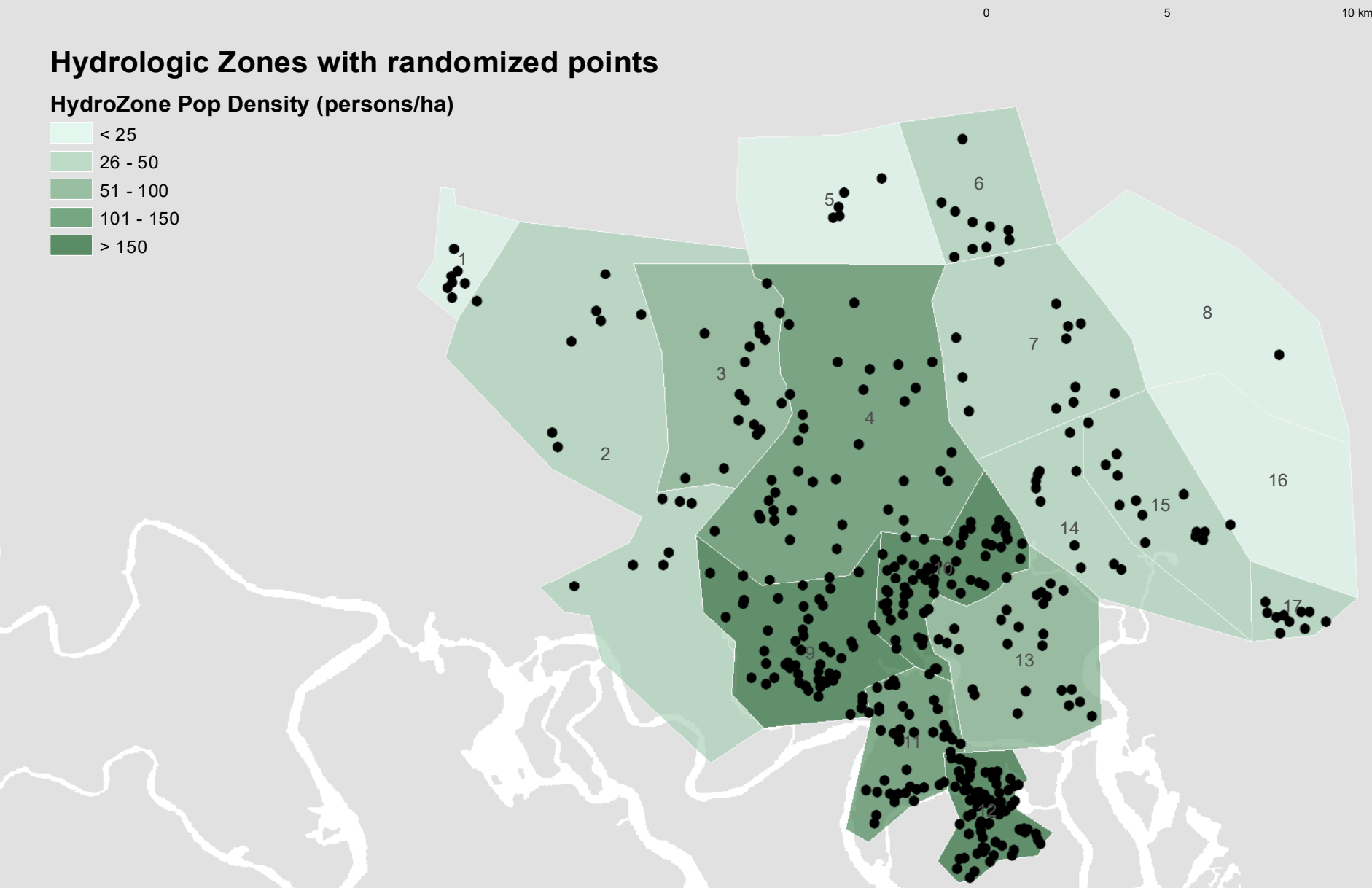
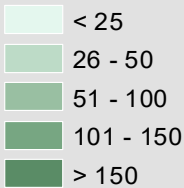
**Not just the rapid killer Cholera, also long-term effects of sanitation related malnutrition and stunting, which is widespread**



# Port Harcourt (Nigeria)

## Hydrologic Zones with randomized points

HydroZone Pop Density (persons/ha)



# Costs

**Key Determinants: (a) Parameters Tested**

**(b) Number of Tests**

**(c) Local Capacity / Laboratory**

**(d) Overheads: Standalone vs. Part of Survey**

Location	Parameters	Number of Tests	Type	Cost per Point
Monrovia	~ 25	204	Standalone	~ \$485
Port Harcourt	~ 10	637	Standalone	~ \$150
Kinshasa	3	1696	Part of Survey	~ \$ 20



# A Final Point

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**So water quality is bad – then what?**

# Merci!



**WORLD BANK GROUP**  
Water

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# Monrovia (Liberia)

**58% of all tested points contaminated with E Coli**

<i>E. coli</i> MPN Range	No. of Samples (%)	Map Color ID
<1	87 (42%)	BLUE
1 to 10	50 (25%)	GREEN
11 to 39	16 (8%)	YELLOW
40 to 100	13 (6.4%)	ORANGE
101 to 200	11 (5.5%)	PURPLE
>200	27 (13.8%)	RED

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