An assessment of the combined risk to human health from flooding and poor sanitary conditions in the community of Gbegbeyise in Accra.

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22nd May, 2012

Coconut Grove Regency Hotel

Background to the study

Flooding a perennial phenomenon in low-lying areas in Accra

Pollution of streams identified as part of the major environmental problems facing the city.

The situation is bad in poor and highly populated communities e.g. Gbegbeyise and may be aggravated due to climate change.

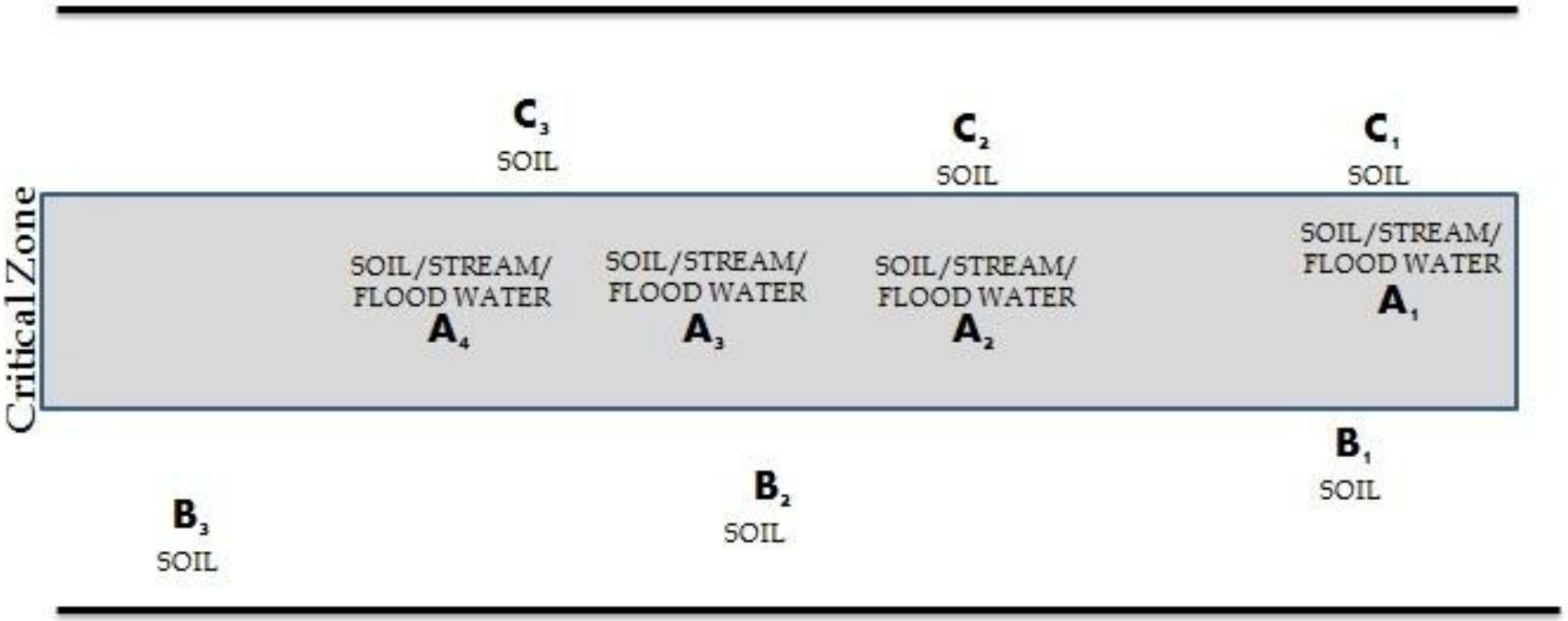
Background continued

One main cost rarely quantified is the health risk to population living in these areas.

This is the first step to find ways and means of containing the related health implications.

Sampling Points

Sampling plan



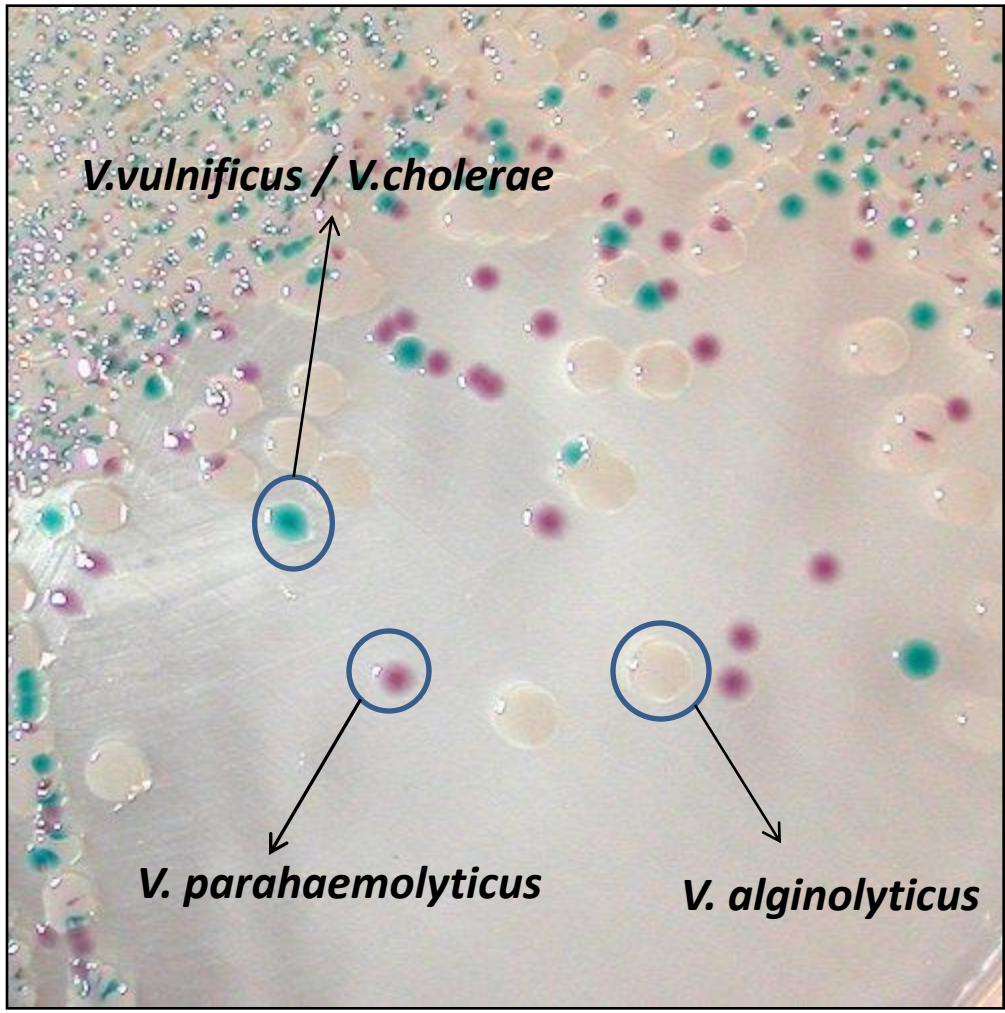
Sample collection and analysis:

Polluted stream water, soil and drinking water

- Before flooding
- After floodingl

Reference pathogens:

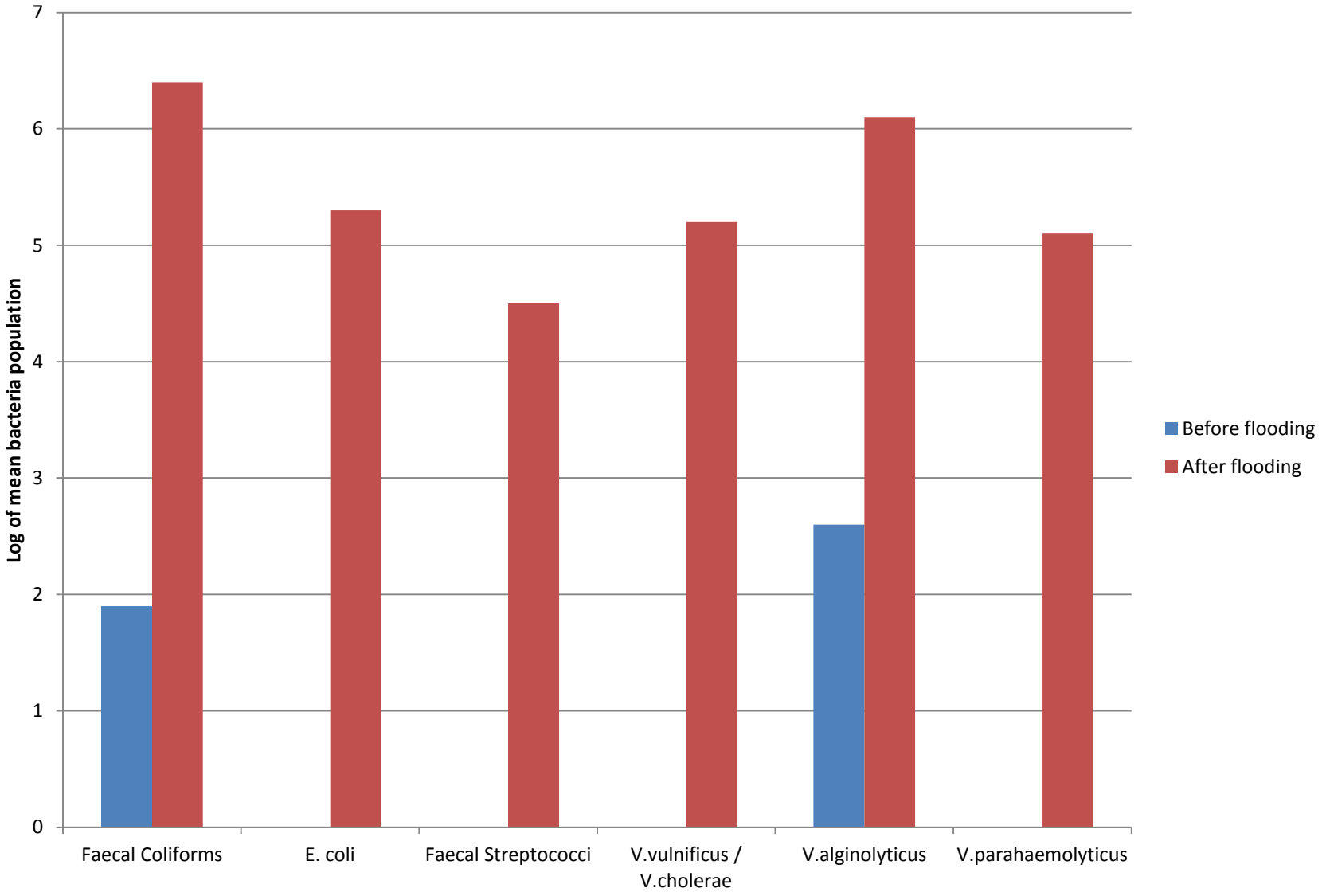
- *Faecal coliforms*
- *E. coli,*
- *Cholera spp.*
- Helminth eggs



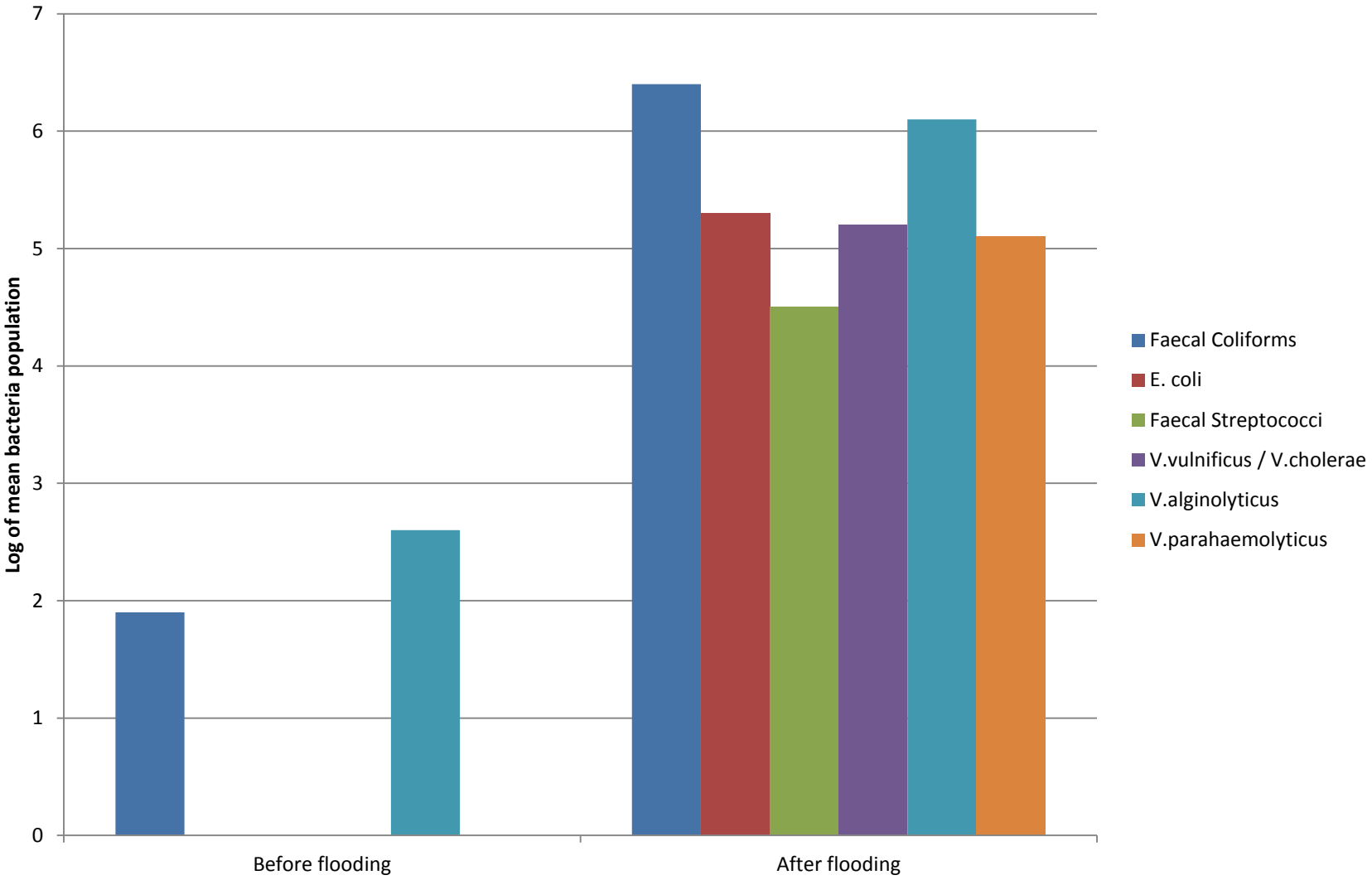
Some results

Gbegbe

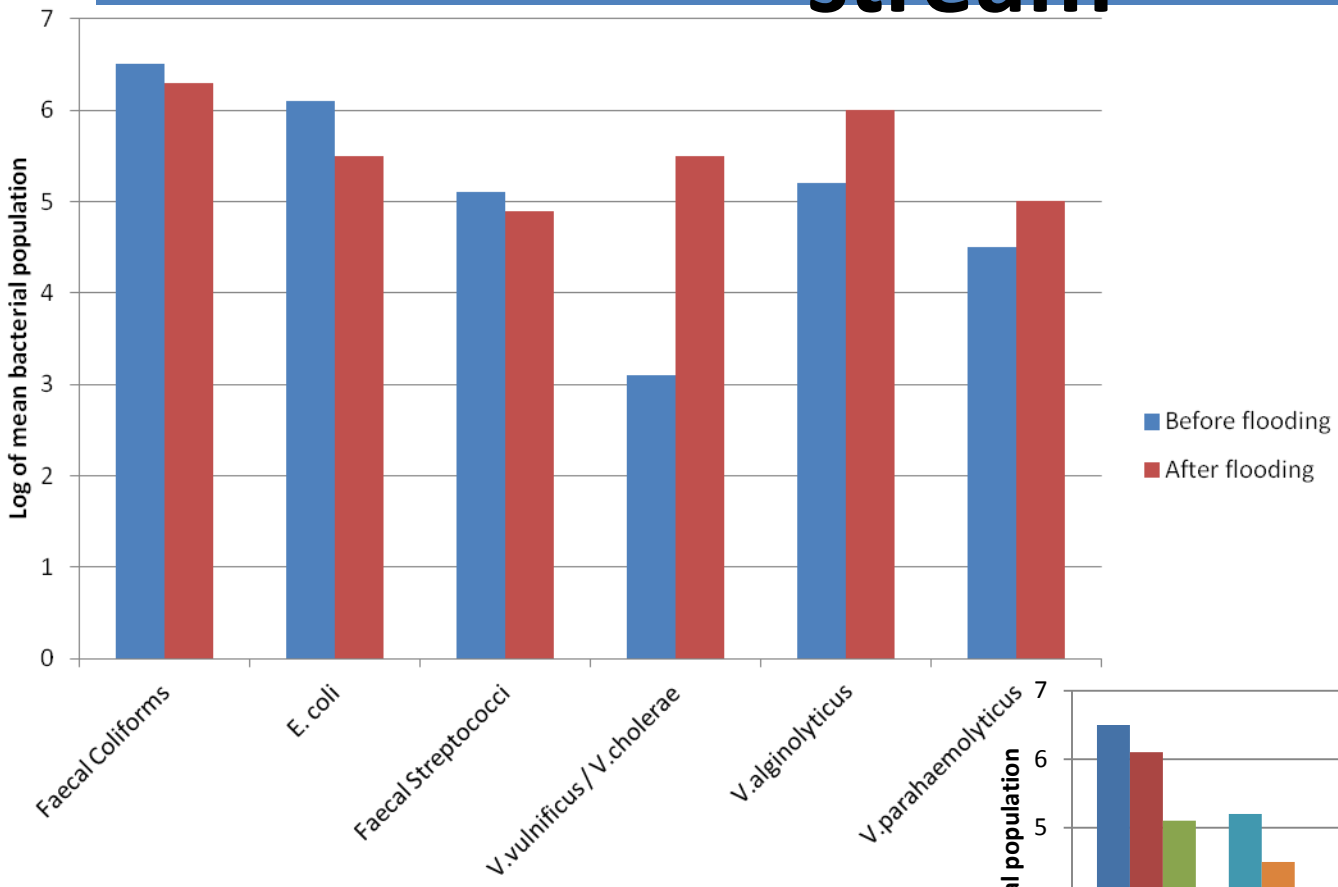
Bacteria contamination levels of Gbegbe

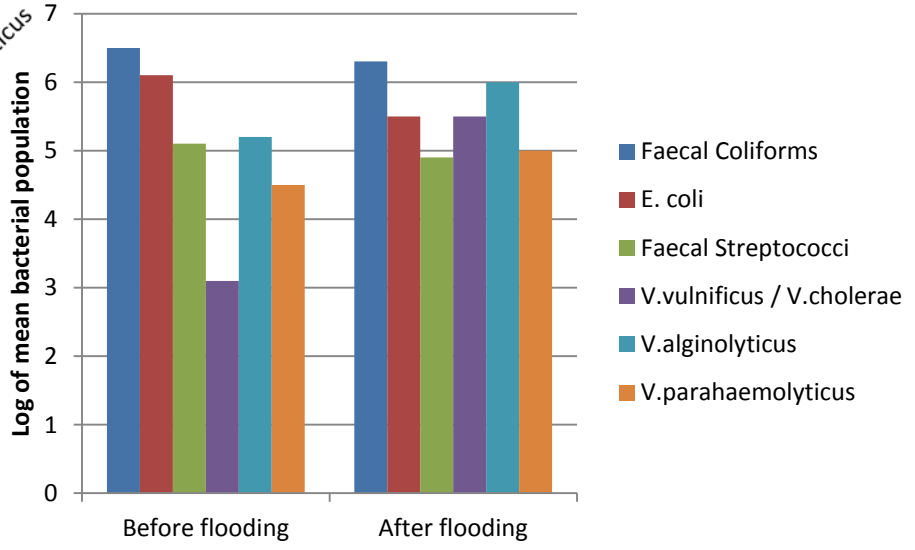


Bacteria contamination levels of Gbegbe

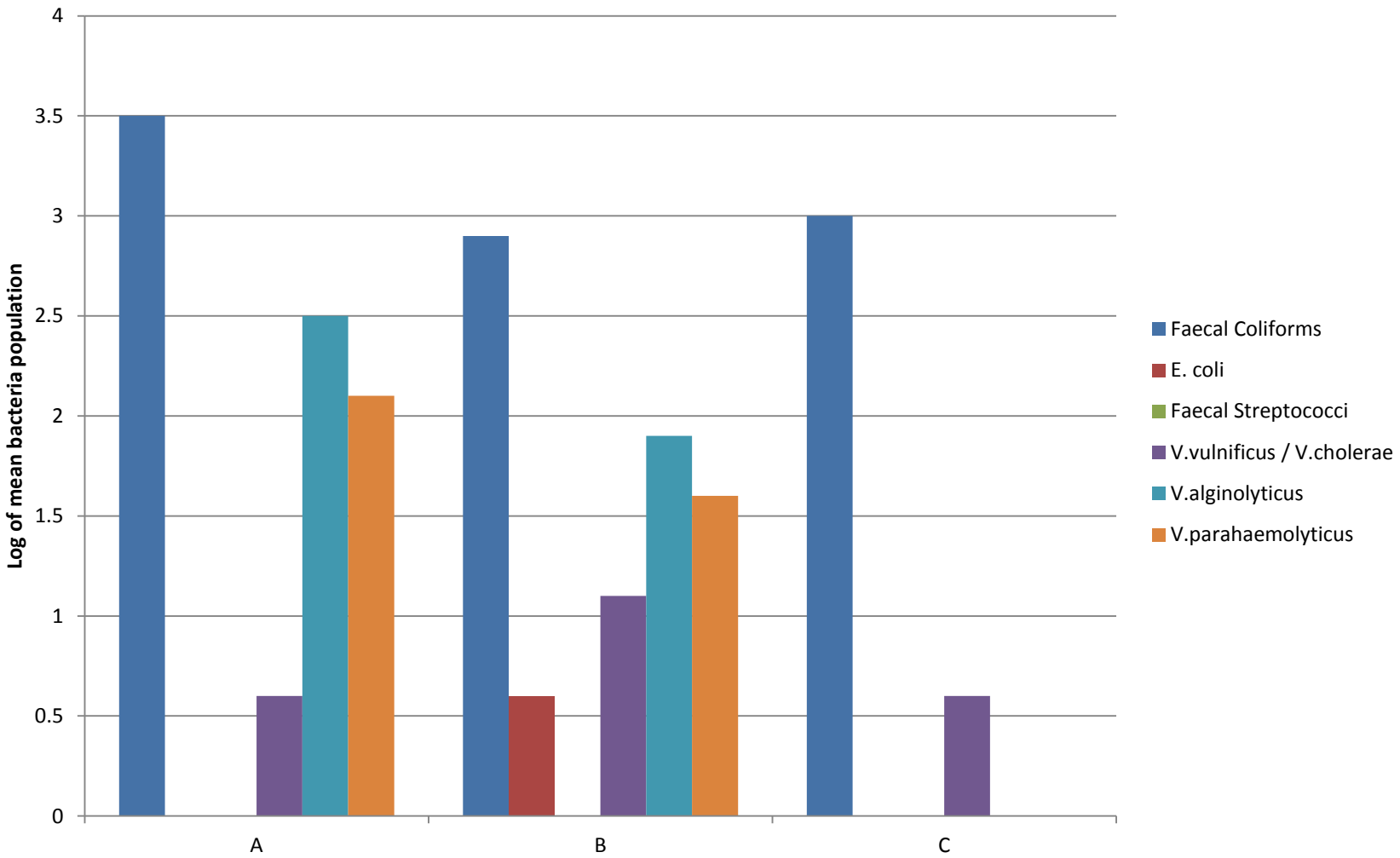


Bacteria contamination levels in stream

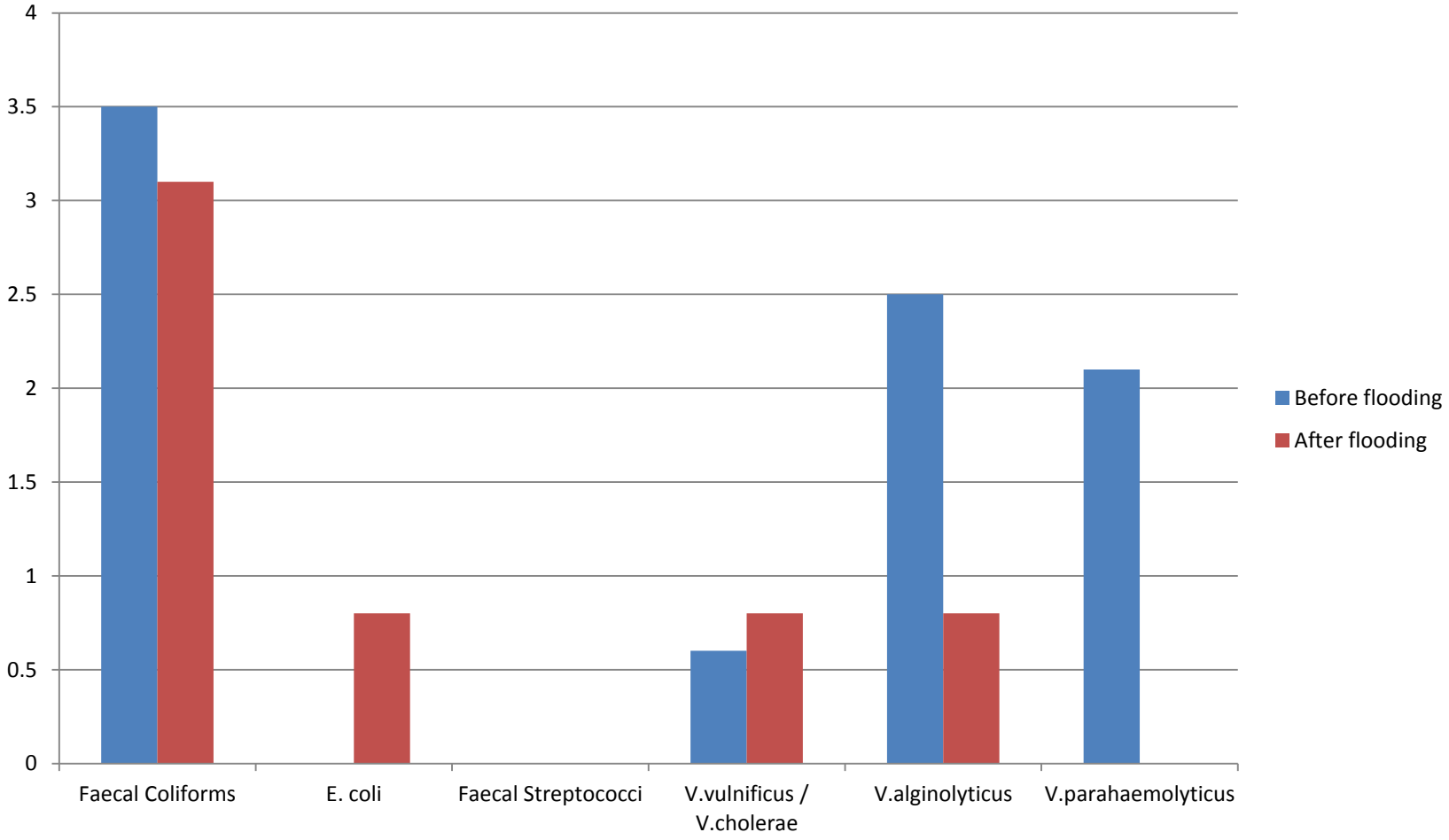




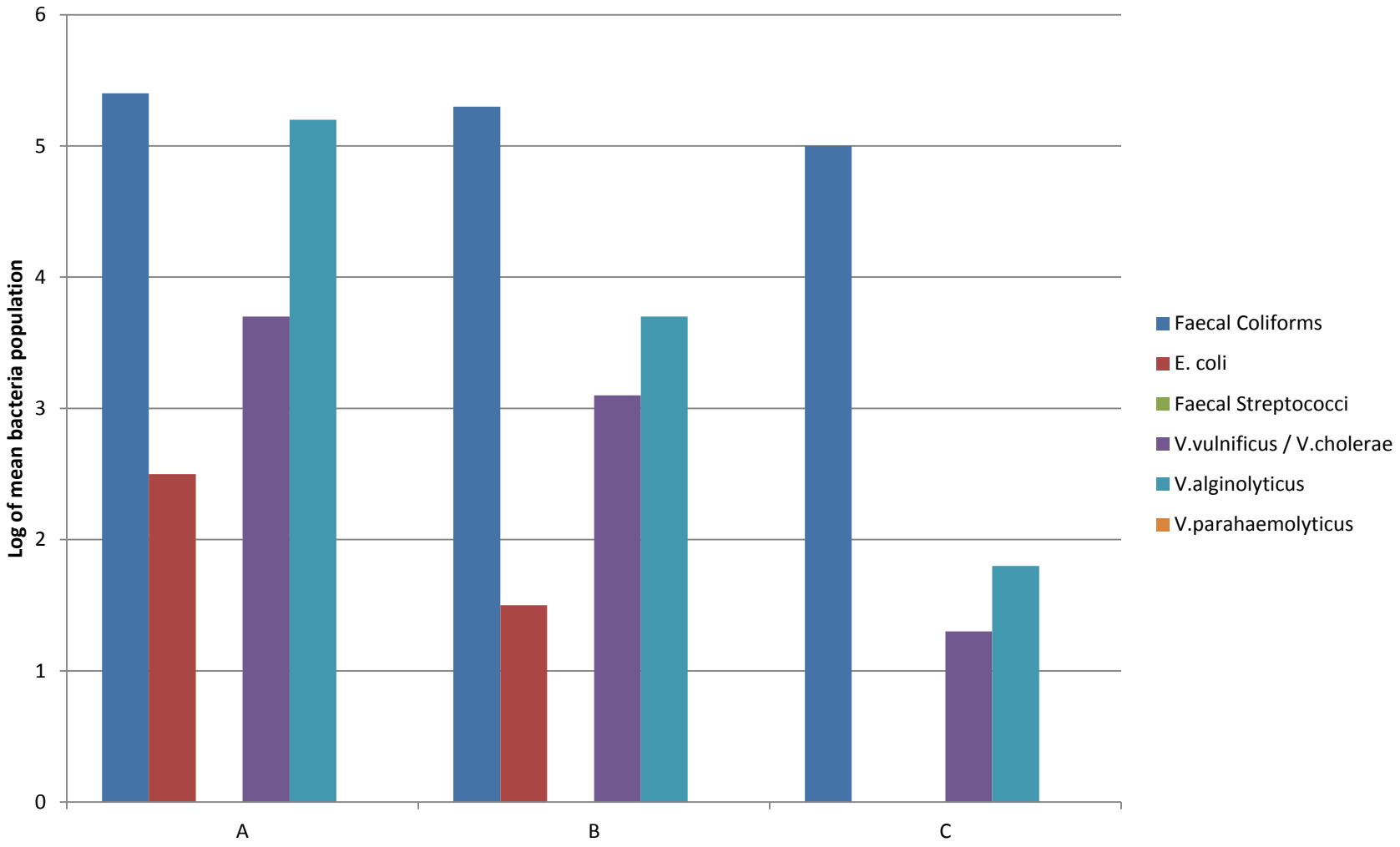
Bacteria contamination levels in drinking water



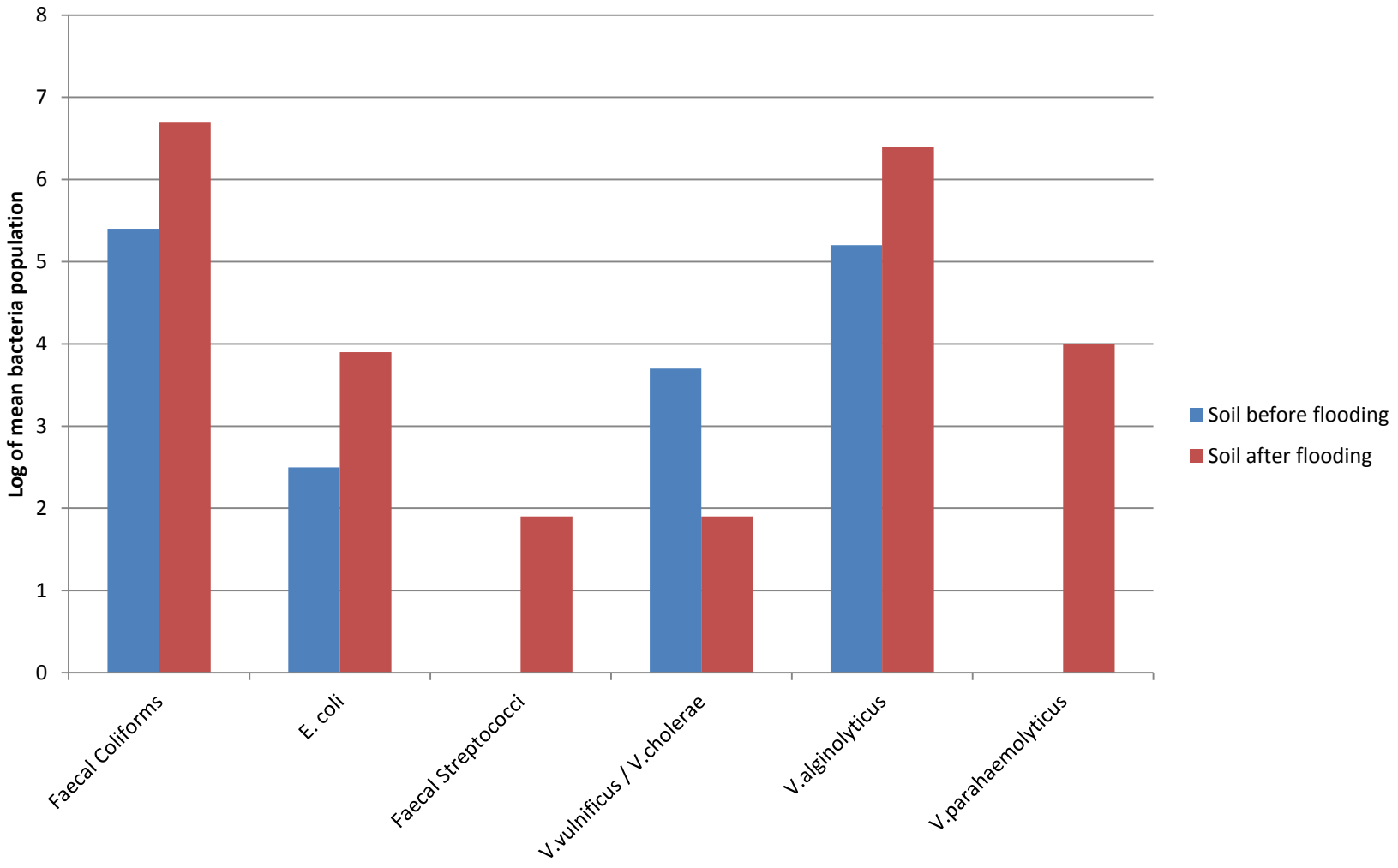
Drinking water quality before and after flooding (site A)



Bacteria contamination levels in soil



Bacteria contamination levels in soil from A



Data required for the QMRA

Parameter	Units	Distribution Type	Value	Description/source/reference
Faecal coliform concentrations in: Floodwaters Drinking water Soil	 #/mL #/mL #/g	lognormal		
E coli concentrations in: Floodwaters Drinking water Soil	 #/mL #/mL #/g	lognormal		
Faecal streptococci concentrations in: Floodwaters Drinking water Soil	 #/mL #/mL #/g	lognormal		
Cholera spp concentrations in: Floodwaters Drinking water Soil	 #/mL #/mL #/g	lognormal		
Conversion factors from indicators to pathogens of concern:				

Parameter	Units	Distribution Type	Value	Description/source/reference
EXPOSURE:				
FLOODWATER Volumes of floodwater ingested Frequency of ingestion Proportion of population exposed	mL per person per day days per year %			
SOIL Soil ingested Frequency of ingestion Proportion of population exposed	g per person per day days per year % (children?)			
CONTAMINATED DRINKING WATER Volumes of water ingested Frequency of ingestion Proportion of population exposed	mL per person per day days per year %			
DOSE-RESPONSE MODELS:				
??which pathogens to model???				

DISEASE BURDEN:				
Disease burden (for each pathogen) – Ghana specific if possible	DALYs/case	Point estimate	campylobacter – 0.06 RV – 0.39 crypto – 0.09 ascaris – 0.05	Lulani, 2008 Lulani, 2008 Lulani, 2008 Lulani, 2008
Susceptibility fraction (for each pathogen and each exposure pathway)	%			

THANK YOU