Varying the payment vehicle in choice experiments: using non-monetary vs. monetary payments in low income countries

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Research Question

- Explore the effects of using monetary vs. labour in discrete choice experiments in LMICs
- Problem with monetary payments:
  - Cash constraints → possible bias arise
  - Underestimate willingness of contribution
  - Exchanges may occur without money
  - Unfamiliar scenarios may appear unrealistic, lead to increased hypothetical bias

➢ Administer a DCE in rural Uganda

➢ Include both labour and money numeraires in choice sets

Previous research

💪 labour hour
💰 wage rate

Time *or* Money:

- Gibson et al (2017); 💪 = 💰
- Abramson et al (2011); 💪 = 0.2 💰
- Rai and Scarborough (2015); 💪 = 0.85 💰

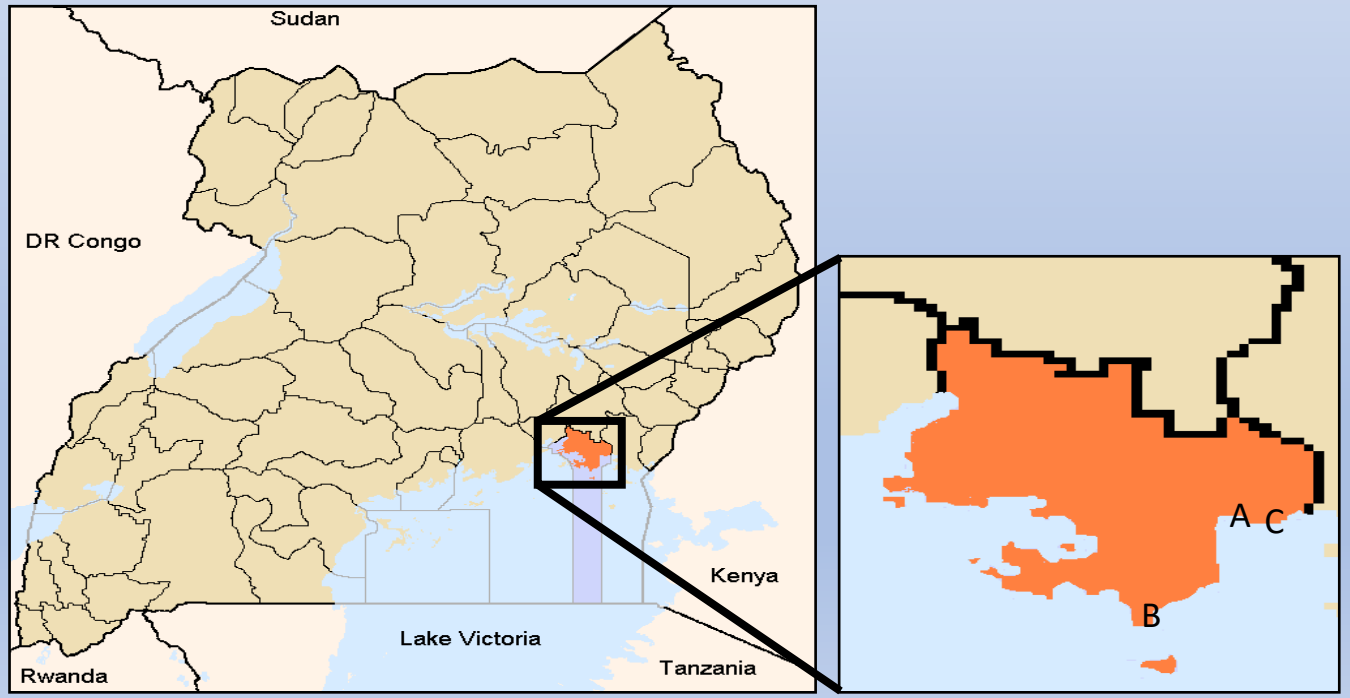
Time *and* Money:

- Rai and Scarborough (2012); 💪 = 0.47 💰
- de Rexende et al. (2015); 💪 = 0.26 (0.52) 💰

Study site: Mayuge, Uganda

- Understand attitudes and behaviours towards policy interventions regarding water access and health education

→to reduce infection of schistosomiasis



3 rural villages:

Bugoto (A)

Bwondha (B)

Musubi (C)

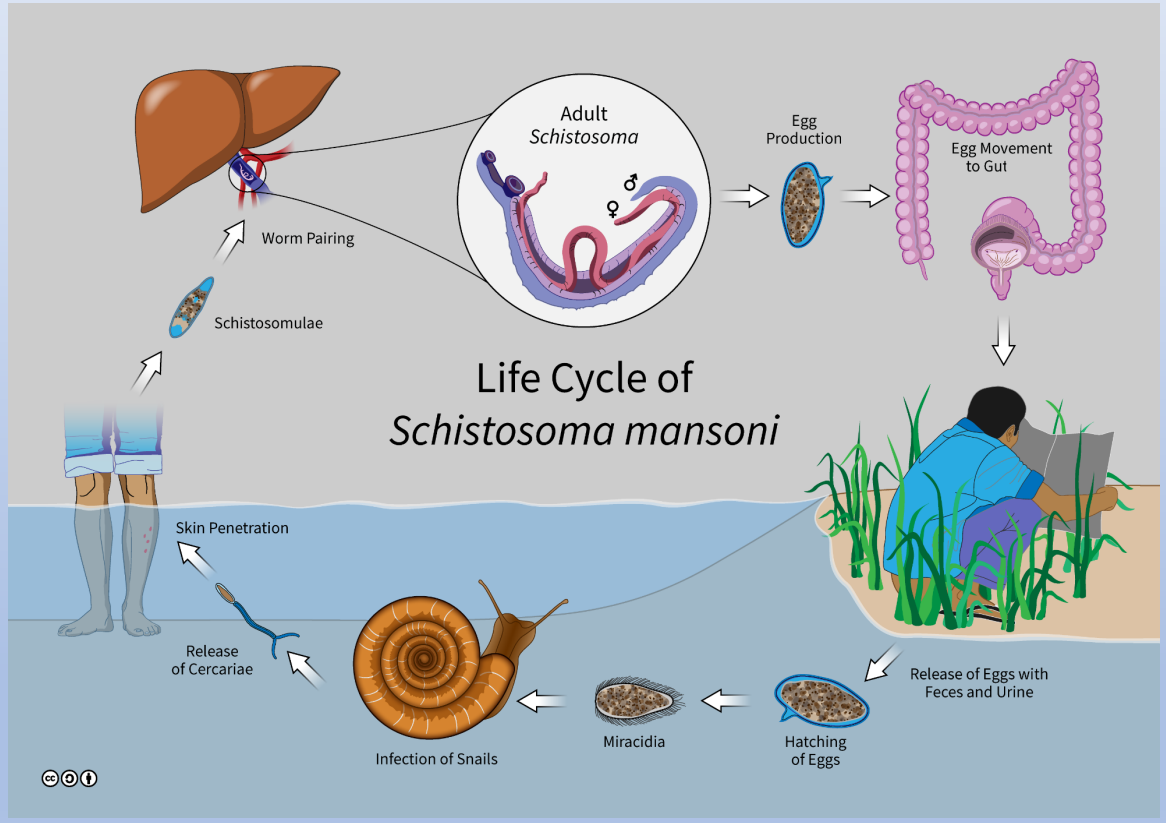
Schistosomiasis

- Water borne parasite
- 240 million people live with Schistosomiasis
- Symptoms: fever, fatigue, prone to illness, reduce cognitive development, etc.

→ *Reduced quality of life*

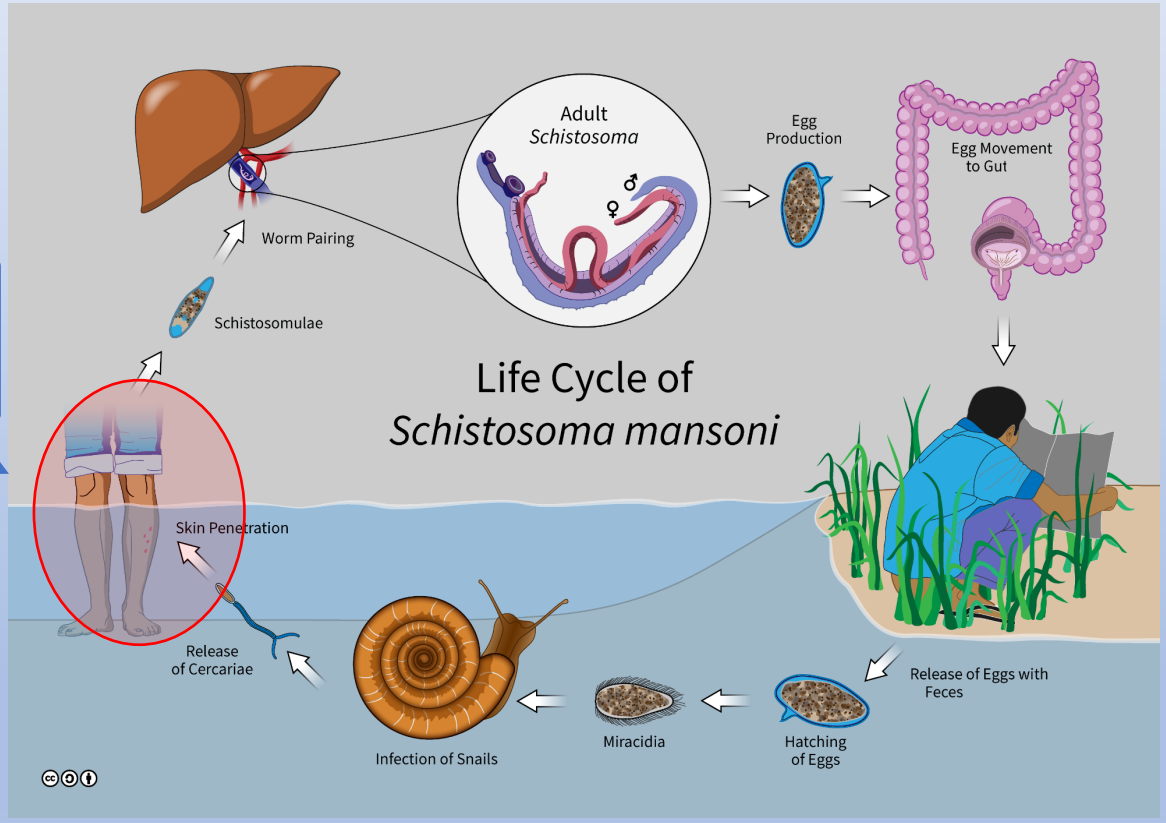
- World Health Organisation: mass drug administration
  - Distribution
  - Not 100% effective
  - High rate of reinfection

Cycle


Adult
Schistosoma
♂
♀
Egg
Production
Egg Movement
to Gut
Worm Pairing
Schistosomulae
Life Cycle of
Schistosoma mansoni
Skin Penetration
Release
of Cercariae
Infection of Snails
Miracidia
Hatching
of Eggs
Release of Eggs with
Feces and Urine

Cycle

Risk to self:
- Contact with contaminated water



Cycle

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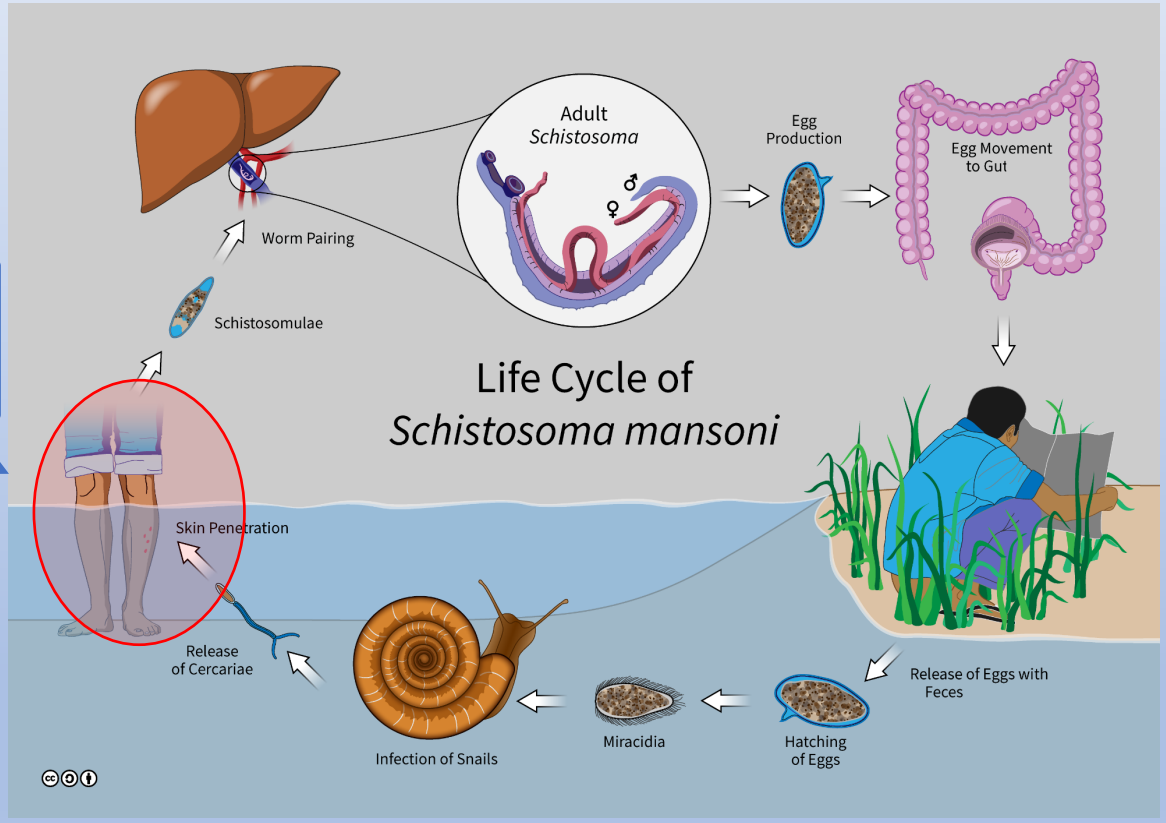
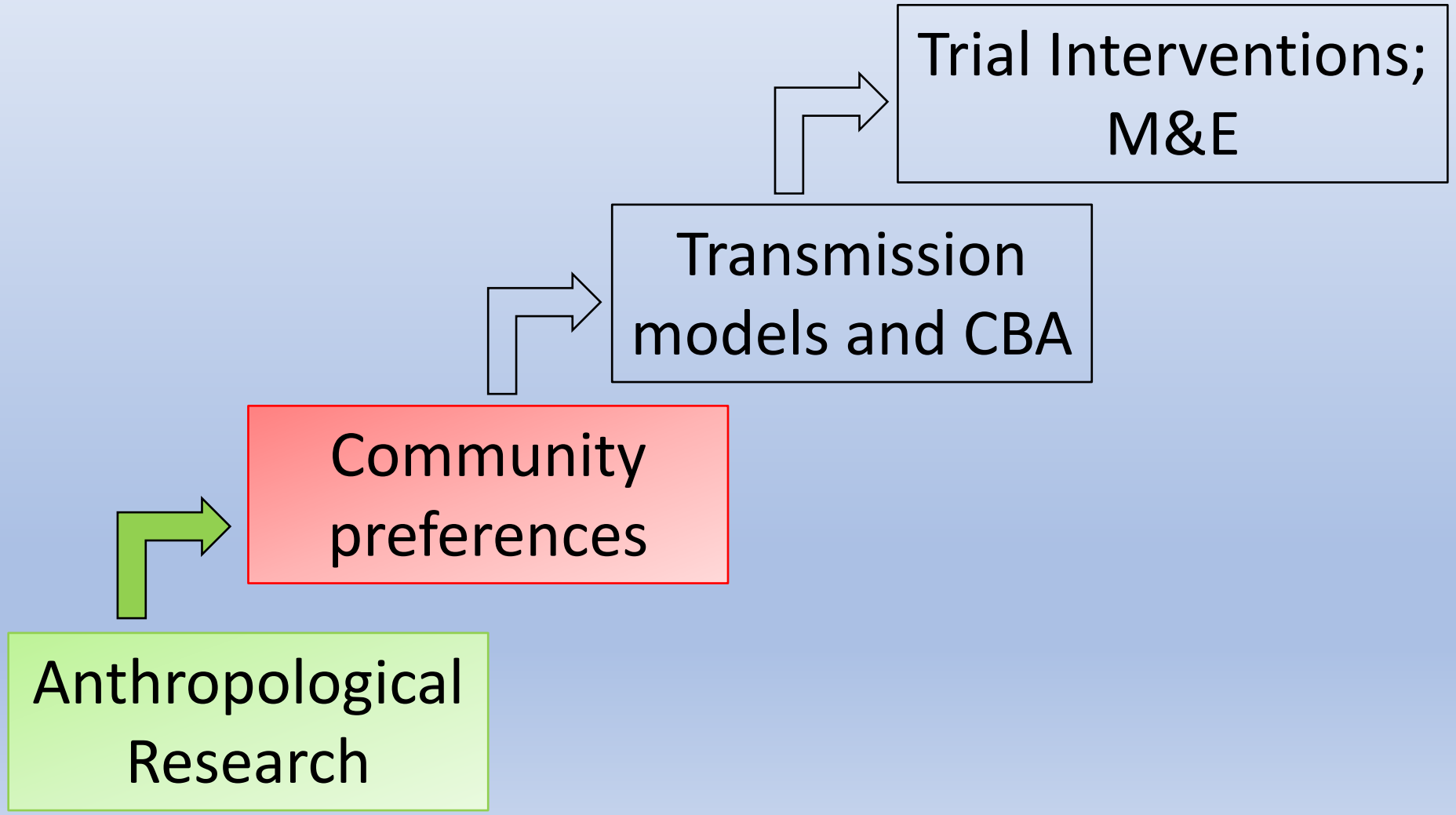
- Contact with contaminated water



- New water sources
- Improve water access
- Education

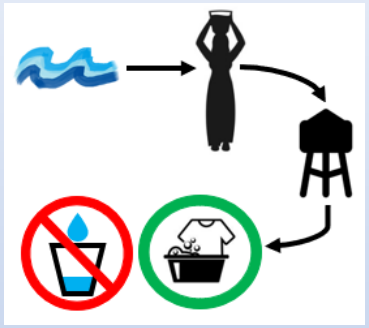
Research Progress

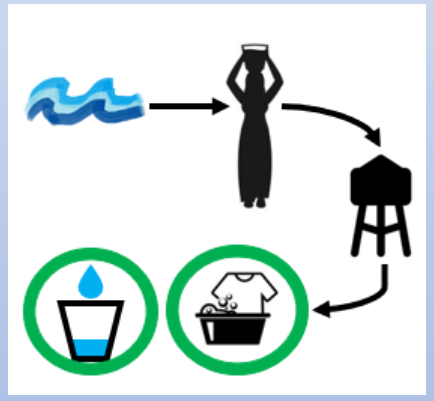


Attributes:

New water source:

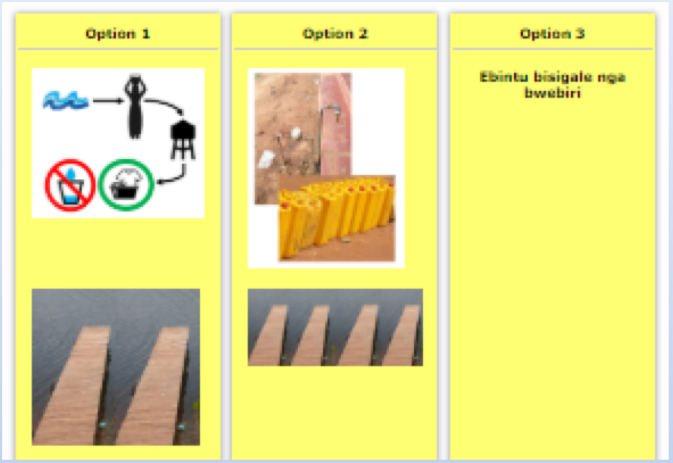
X





Attributes:

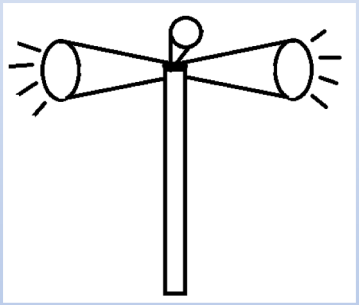
New water access points:

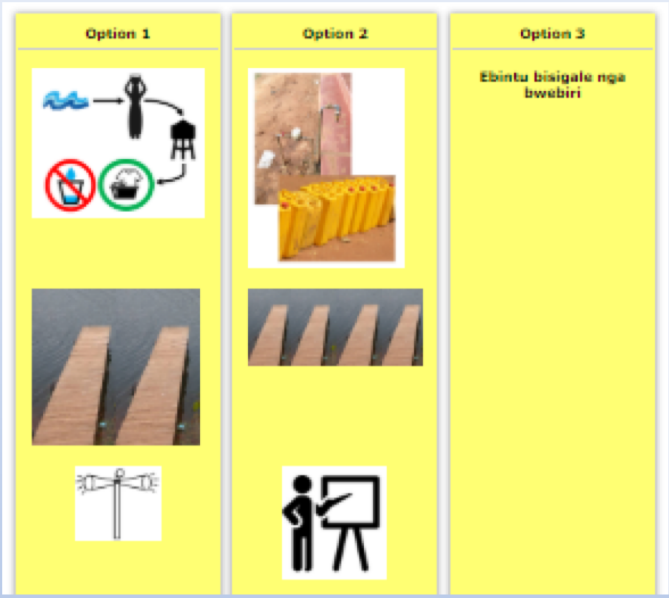


X

Attributes:

New education campaign:





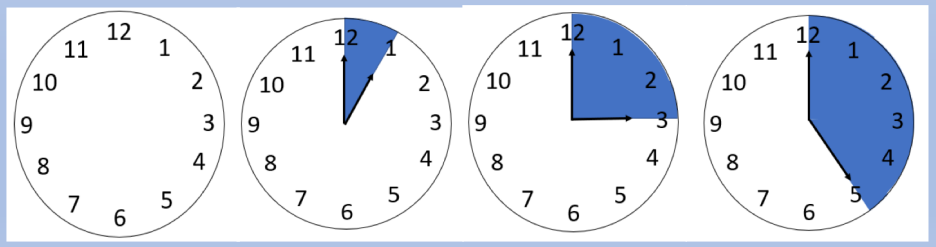
X

Attributes:

Monthly fee:

1500 UGX ~£0.32
3000 UGX ~£0.64
6000 UGX ~£1.28
0 UGX

Weekly labour:



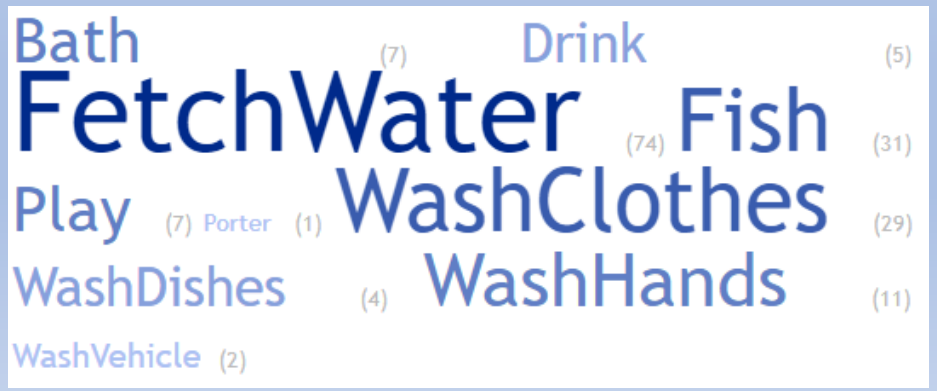
Summary Stats

7703 UGX = $2.03
Median 4000 UGX = $1.07

Variables	Average
Female	0.47
Year of Education	
Less than Primary	0.515
Primary	0.38
Ordinary Secondary	0.08
Advanced Secondary	0.0094
Tertiary	0.0024
Household size	6.35
Children under 18	3.67
Children under 5	1.36
Occupation	
Fisherfolk	0.25
Farmer	0.44
Local Business	0.17
Income	7703

Summary Stats

Variable	Percent
Has heard of bilharzia	99%
How do you contract bilharzia:	
- Drinking lake water	58%
- Contact with contaminated water	55%
- Open defaecation	25%
Lake was most visited water source in the last week	59%
Length of time with hands or feet submerged	
- Less than 5 minutes	25%
- 5-15 minutes	12%
- 16-30 minutes	8%
- 31+ minutes	30%



Random Parameters Model

- Utility function

$$U_{ni} = \beta_{1i} New\ Water\ Source + \beta_{2i} Landing\ Sites + \beta_{3i} Education + \beta_{4i} Monthly\ Fee + \beta_{4i} Weekly\ Labour + \beta_{5i} None + \boldsymbol{\beta}'(z_n * Fee) + \varepsilon_{ni}$$

- Co-variates

$$Z_n = (knowledge, submerged, income, female)$$

Knowledge = 1 if knows how one contracts schistosomiasis

Submerged = 1 if spends 15+ minutes in lake water

Income = arc sign of income

Female = 1 if female

RPL-Model

	CLM	RPL
Water Source		
Tap 2 jerry cans	+++	+++
Tap 10 jerry cans	+++	+++
Lake filtration- non-potable	---	---
Lake filtration- potable	+++	+++
Landing Sites	+++	+++
Sensitise		
Murals	+++	+++
Public radio	+++	+++
VHT talks	+++	+++
None	-	---
Fee	---	insig.
Labour	insig.	---
Interactions with Fee		
Knowledge	--	---
Submerge	++	insig.
Income	insig.	Insig.
Female	---	insig.
Log-likelihood	-1821.703	-1685.975

RPL-Model

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Tap 2 jerry cans	+++	+++
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VHT talks	+++	+++
None	-	---
Fee	---	insig.
Labour	insig.	---
Interactions with Fee		
Knowledge	--	---
Submerge	++	insig.
Income	insig.	Insig.
Female	---	insig.
Log-likelihood	-1821.703	-1685.975

Willingness to pay/work

$$WTP = \frac{\beta_k + \sigma_k * \phi_k}{\beta_{fee}} ; WTW = \frac{\beta_k + \sigma_k * \phi_k}{\beta_{labour}} ; \text{WTW * 4.3}$$

	WTP Monthly	WTW Weekly	WTW Monthly
Water Source			
Tap 2 jerry cans	14110.25	14.88	64.01
Tap 10 jerry cans	24975.16	26.35	113.3
Lake filtration- non-potable	-8026.18	-8.47	-36.41
Lake filtration- potable	14558.95	15.36	66.05
Landing Sites	2552.83	2.69	11.58
Sensitise			
Murals	6052.63	6.39	27.46
Public radio	6555.61	6.92	29.74
VHT talks	11351.92	11.98	51.5
None	-11896.76	-12.55	-53.97

Shadow wage rate

$$\frac{WTP}{WTW} = \frac{14110\ UGX/Month}{64.01\ Hours/Month} =$$

220.43 UGX/hour

- Assuming working 10 hours per day, average wage = 400 UGX/hour
- Shadow wage rate = 55% market wage rate

Results from Latent Class Model

- 4-classes
- Gender, Income, Knowledge, Submerged → Covariates

Attribute	Class1	Class2	Class3	Class4
Monthly Fee	---	---	+++	++
Weekly labour	--	insig.	insig.	--
None	insig.	--	--	insig.
Class Size	**0.21**	**0.10**	**0.58**	**0.10**

Log Liklihood -1582.77

Conclusions

- Large portion of respondents have positive marginal utility for fee…
  - Confusion?
  - Strategic bias?
  - Paying for goods signals quality
- Is labour appropriate?
  - 21% dislike both money and labour
  - 10% prefer to pay in money over labour
  - 💪🏽 = 0.55💰 (slightly less in Latent Class Model)

Thank you!

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