



Willingness-to-pay for a rapid malaria diagnostic test and artemisinin-based combination therapy from private drug shops in Mukono district, Uganda

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Background



Malaria still a major health problem worldwide

- There were an estimated 216 million episodes of malaria
- There were an estimated malaria 655,000 deaths
- Majority of morbidity and mortality is in Africa
- Most at risk are children below 5 and pregnant women

(World Malaria Report 2011)



Background



Malaria is an entirely preventable and treatable disease

- We have effective treatment
- We have preventive interventions that work and are cost-effective
- All deaths from malaria are avoidable

Why has it come to this?



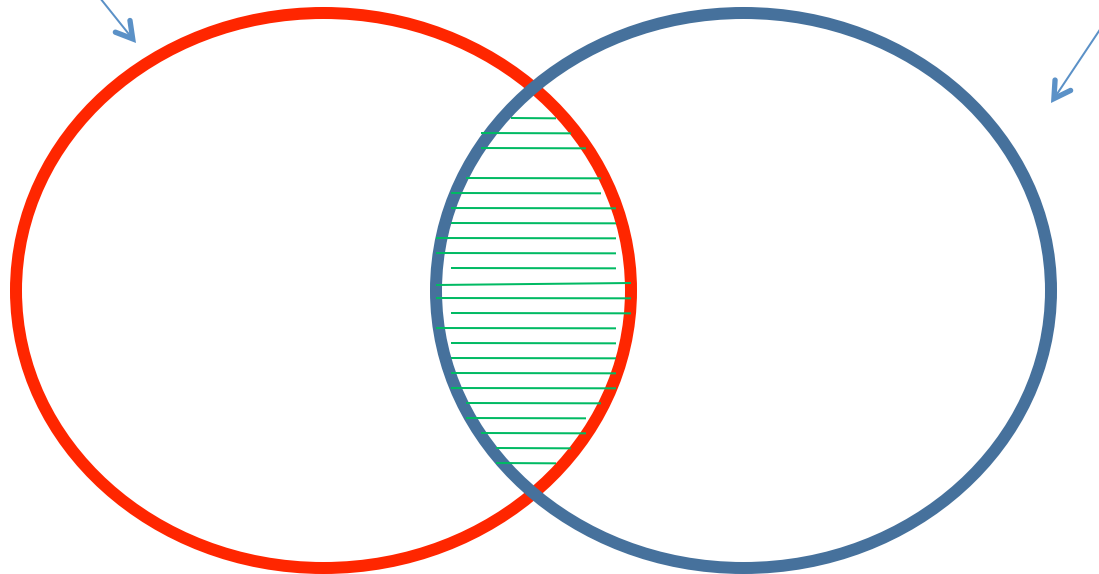
Background



Major obstacle: access and targeting

Individuals suffering a true malaria episode

Individuals receiving an effective





Background



Paradox: large numbers of individuals who are not ill from malaria get an antimalarial while many people suffering from malaria do not get treated with an effective antimalarial (AM)

(1) Access: ease with which an effective AM can be acquired by individuals

- distance to health provider
- socio-economic status: poor may not afford effective AM or high quality services

(2) Targeting: effective AM given only to those individuals with true malaria

- Diagnosis of malaria requires parasitological testing
- testing rate among suspected malaria patients around 50% in public sector and 15% in private sector (African region)
- Over-treatment of fever patients with antimalarials



Background



Current WHO guidelines on malaria treatment

- All persons of all ages with suspected malaria:
 - should receive parasitological confirmation of diagnosis (microscopy or rapid diagnostic test)
 - uncomplicated malaria (*P.falciparum*) should be treated with an artemisinin-based combination therapy (ACT)

ACT highly effective but expensive

- compared to older, less effective antimalarials (resistance)

Malaria RDTs accurate and easy to perform with little training

- opportunity to expand parasitological diagnosis

Background

In many parts of Africa, the first point of seeking treatment for fever is the private informal health sector

- As many as 10-60% visit drug shops as first point of care
- In Uganda, 50% of all distribution of AMs through drug shops





Background



Characteristics of drug shops (wide range):

- level of qualification of staff typically low
 - sell cheap but less effective AM drugs
 - ACT less frequently available and only at much higher price
 - diagnosis typically made without parasitological test
 - advantage: often nearby and may therefore save lives
-
- ➔ Over-treatment with antimalarials – often not an ACT
 - ➔ Misdiagnosis: some patients get wrong treatment



Background



Given that so many people go to drug shops it is important that services are as good as possible

Cluster-randomised trial recently finalised among drug shops in Mukono District, Uganda:

➔ Is it feasible to increase appropriate treatment in drug shops:

- (1) Treatment of suspected malaria only after a parasitological test
 - rapid diagnostic test (RDT) for malaria
- (2) Treatment with an artemisinin-based combination therapy (ACT)

Pre-study:

what are drug shop customers willing to pay for RDT and ACT?

ensure that some/most of customers will buy the RDTs and RDT



Aim



Contingent valuation survey among drug shop customers to capture their willingness-to-pay (WTP) for:

- (1) An RDT performed by a trained drug shop vendor.
- (2) A course of ACT for an adult (without a test).
- (3) A course of ACT for an adult after the purchase of an RDT (that turned out to be positive).



Methodology



Exit interviews at drug shops in Mukono District:

Eligibility criteria

- customers leaving drug shop having purchased an antimalarial or requesting treatment for fever
- customer 15 years and above
- if customer less than 15 years → interview with main caregiver



Methodology



Questionnaire focussing on:

(1) Willingness-to-pay elicitation

- Bidding game

(2) Background characteristics of respondent: age, sex, education, occupation of head of household, health-seeking behaviour, distance travelled today including costs, experience of malaria/fever in past 2 weeks in the household

(3) Ownership of assets in the household of the respondent

- Development of wealth index



Methodology



Willingness-to-pay elicitation (example: RDT)

Explanation of RDT to respondent:

- fever or headache → not necessarily malaria
- malaria is caused by parasites in your blood
- can only be diagnosed by a microscope or an RDT
- the result ready in 15 minutes when using RDT, no risk of transmission of diseases, can only diagnose malaria
- RDT must be done by trained person
- Demonstration (without taking blood)



Methodology



Willingness-to-pay elicitation (example: RDT)

“If drug shops had rapid malaria tests available today – would you be willing to pay UGX 500 (US\$0.25) for a rapid diagnostic test?”

Interviewers:

- bidding game auction process until respondent says no:
→ UGX700 (US\$0.35), UGX1000, UGX1500, UGX10000 (US\$4.98)

Auction process ends with open ended question:

“What is the maximum amount you would be willing to pay for a rapid malaria test?”



Results



General:

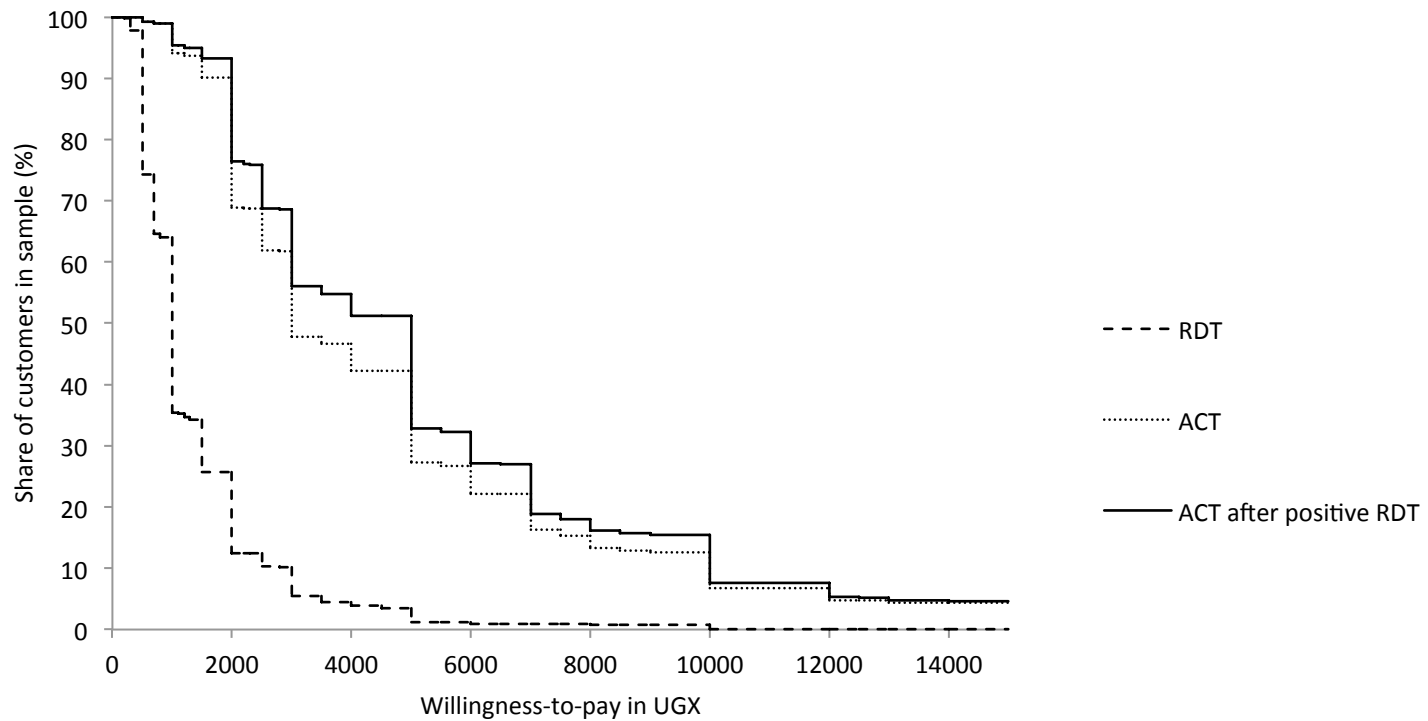
- 519 customers interviewed in 25 drug shops in 2009
- 95% reported that it would be useful if a test for malaria could be performed at drug shops
- 21 respondents (4%) reported having purchased an artemisinin containing drug today



Results



Figure 1: Share of drug shop customers with willingness-to-pay in UGX at a given value or higher for an RDT, a course of ACT and a combination of ACT and RDT, Mukono District, 2009, UGX2010 = US\$1.

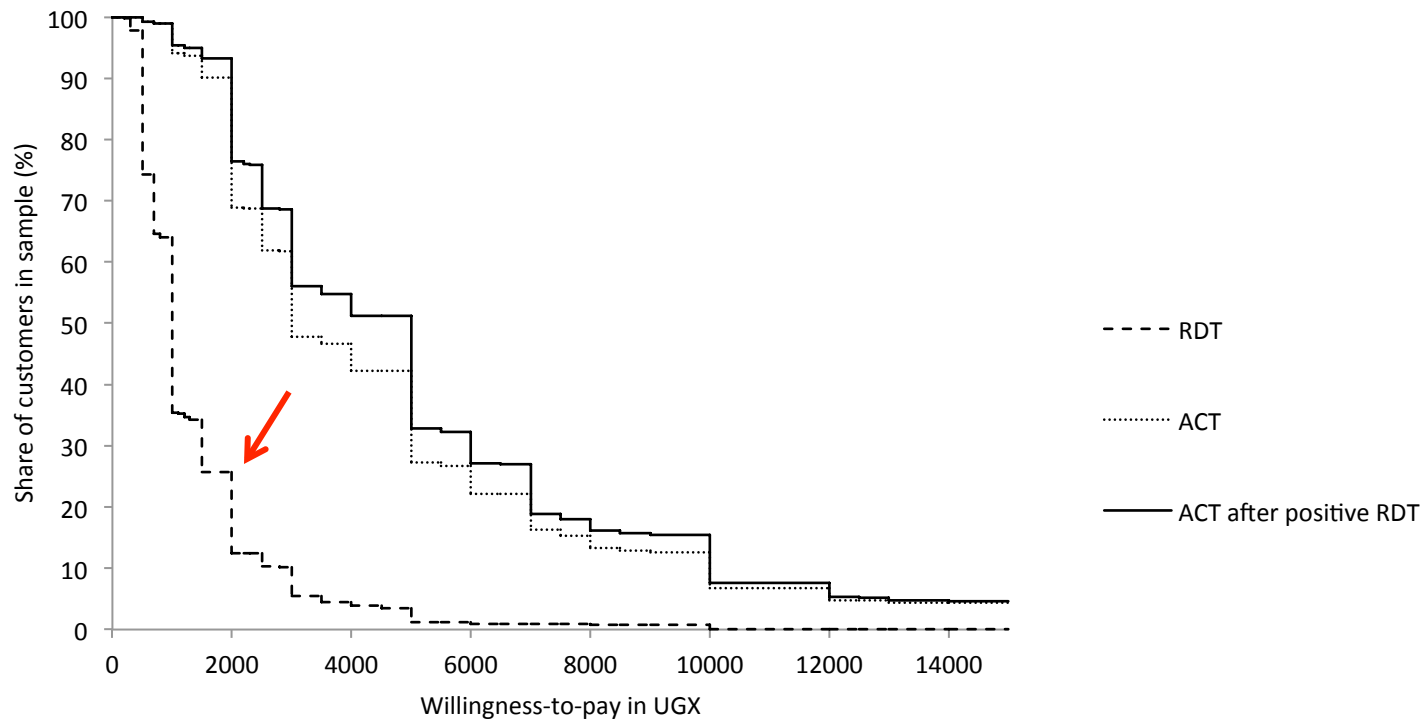




Results

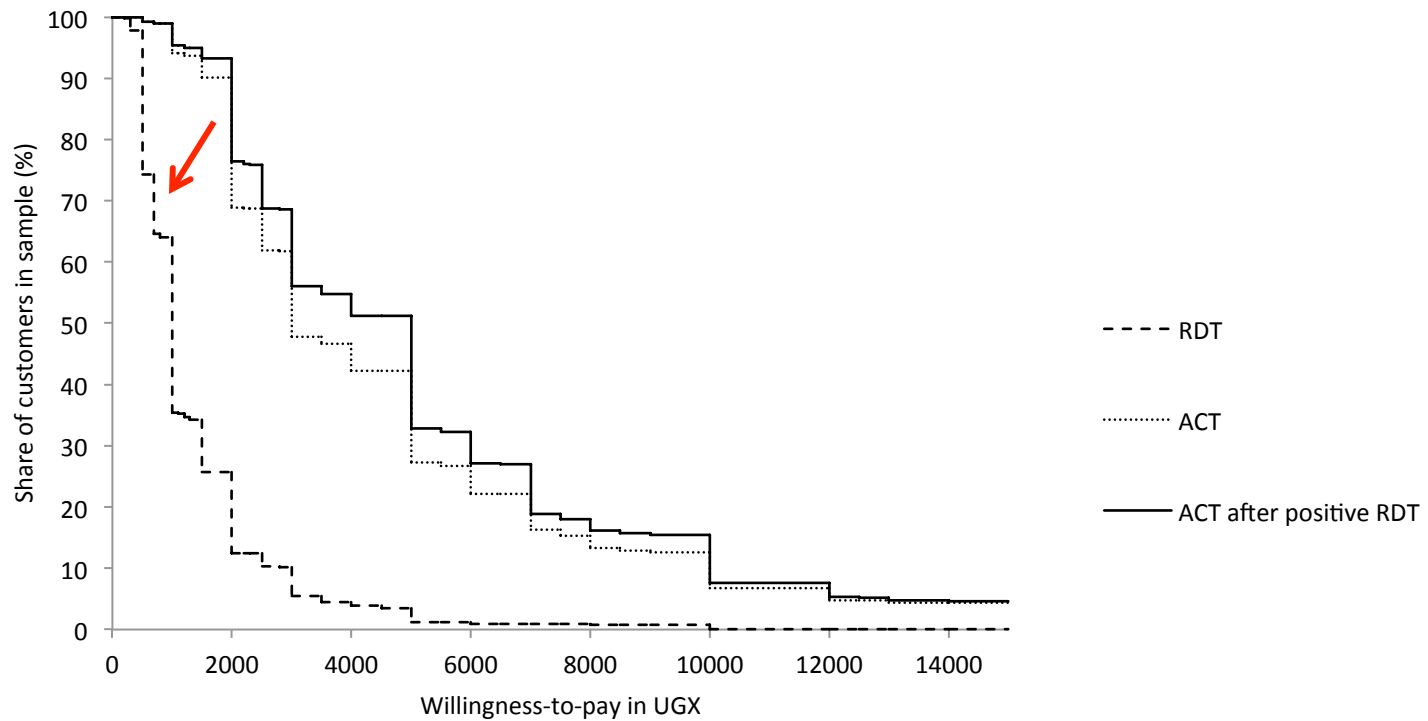


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Results

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Results



Figure 1: Answer to the question: if the price was X how many drug shop customers would purchase the goods

- 74% would pay UGX700 (US\$0.35) or higher for an RDT
- 25% would pay UGX2000 (US\$1.00) or higher for an RDT
- 70% would pay UGX2000 (US\$1.00) or higher for a course of ACT
- 25% would pay UGX6000 (US\$2.99) or higher for a course of ACT
- 58% of drug shop customers stated the same WTP for ACT whether malaria diagnosis is confirmed by RDT or not
- 33% of drug shop customers stated higher WTP for ACT when malaria diagnosis is confirmed
- Mean WTP for ACT significantly higher when malaria is confirmed



Results



Factors associated with WTP (RDT example)

Multiple regression analysis between $\ln(\text{WTP for RDT})$ as dependent variable and background characteristics of respondents as explanatory variables:

- Decreasing WTP for increasing age
- Increasing WTP for increasing socio-economic status
- Lower WTP if family members had experienced fever/malaria in the past two weeks as compared to not having experienced fever/malaria
- Higher WTP if malaria diagnosis had been obtained prior to drug shop visit (laboratory test or health worker)

No association between WTP and the following: gender, marital status, education, travel time, travel distance



Discussion and conclusions



- (1) Prices for an RDT and a course of ACT substantially higher than the WTP among majority of drug shop customers
 - Possible market price for an RDT: UGX5220-5800 (US\$2.60-2.89)
 - (manufacturer price + mark-up)
 - 4% of drug shop customers had a WTP of UGX5000 or higher (US\$2.49)

 - Current price adult course of (non-study) ACT observed in drug shops: UGX5000 (US\$2.49) and upwards
 - 42% of drug shop customers had a WTP of UGX5000 or higher
- ➔ Policy implication: Substantial subsidy is needed to encourage purchase of RDT and ACT



Discussion and conclusions



(2) Scepticism regarding diagnosis of malaria using an RDT in drug shops

- 74% of drug shop customers had a WTP of UGX700 or higher (US \$0.35)
- 58% of drug shop customers had the same WTP for ACT whether malaria diagnosis was confirmed by RDT or not

Possible policy implications

- ➔ large subsidy for RDT needed
- ➔ information campaign on the advantages of RDT needed
- ➔ diagnosis and treatment as a (conditional) package



Discussion and conclusions



(3) Recommended prices for the trial:

- RDT: UGX500 (US\$0.25)
- Adult course of (study) ACT: UGX3000 (US\$1.49)
- Child course of (study) ACT: UGX2000 (US\$1.00)

Results from the trial:

- More than 90% of customers arm purchased an RDT if offered
- More than 90% of RDT-negative customers did not purchase a study ACT (first 5 months of trial) but deteriorated over time