

Can Good Products Drive Out Bad? Evidence from Local Markets for (Fake?) Antimalarial Medicine in Uganda

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Motivation

- Fake medicines are a global public health problem
- Evidence of antimalarial drug quality (Nayyar et al., 2012)
 - **35% of medicines in public and private outlets in sub-Saharan Africa are fake**
 - Similar for South-east Asia
 - Similar problem for antibiotics
- Implications for child mortality and long-term human capital accumulation

Common Explanations

- **Profit motives** at all levels in the global supply-chain: manufacturers, counterfeiters, government officials, health care workers, wholesalers, retail drug shops
- Insufficient **internal quality-control** in production process and **regulation and monitoring** of the supply-chain
- **Imperfect competition**
- Widespread **self-prescription** and **poor knowledge** about product authenticity among consumers

However, there is essentially very little evidence of how supply and demand forces drive drug quality, and how to combat the problem

- We provide evidence from the private retail sector in Uganda

Observability: Which one is fake?



A

B

Observability: Which one is fake?

Fake

Authentic



A

B

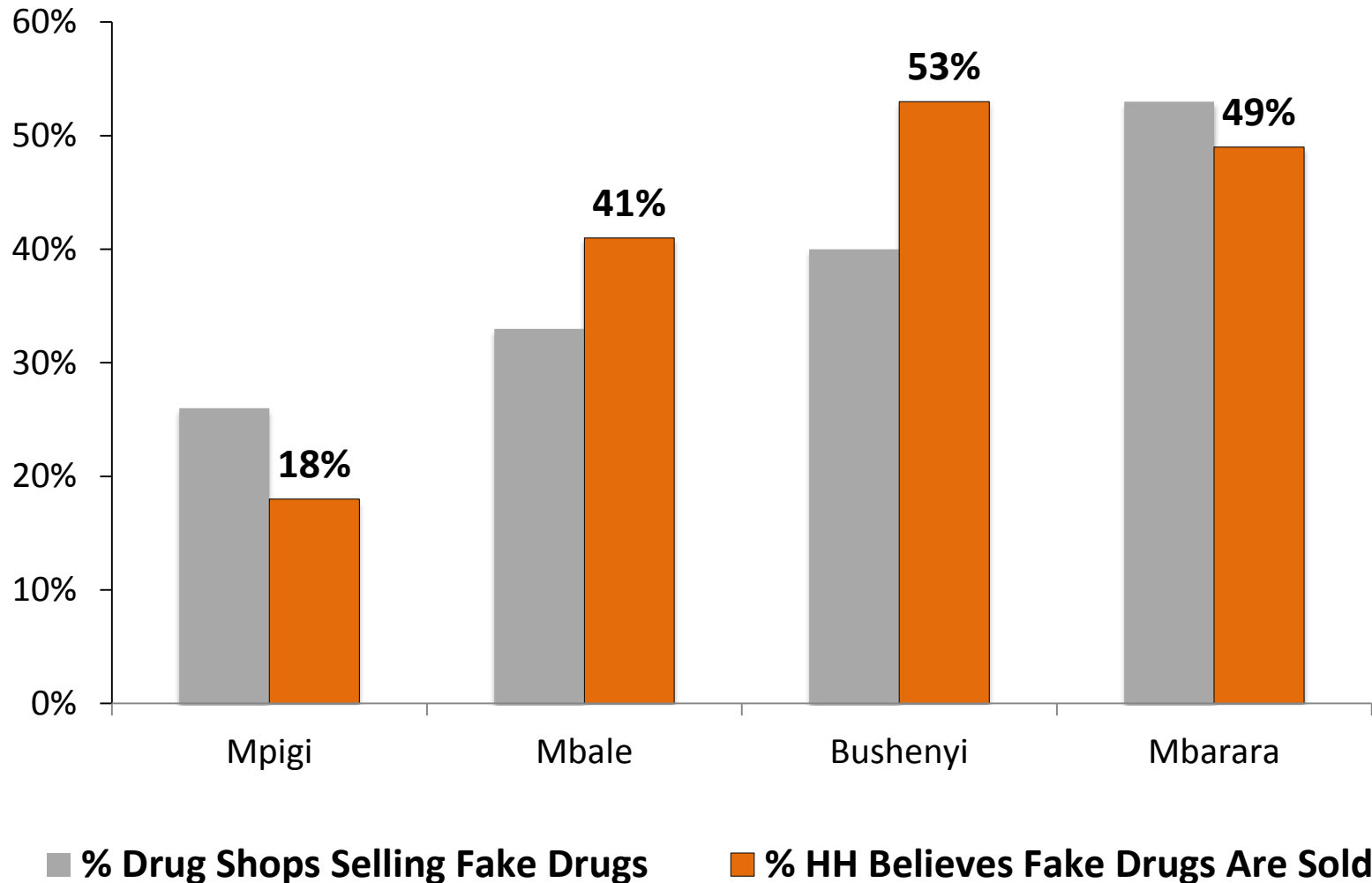
Are fake drugs cheaper?

- Prices may “signal” quality
- The problem may be **less severe** if households can pay a little extra and get authentic drugs
- However, the data from Ugandan drugs shops shows that fake drugs are on average sold at the **same price** as authentic drugs
 - a. Similar to Akerlof (1970)

Do households suspect fake drugs?

- Households may realize that drugs are fake and ineffective
- Suspecting fake drugs would lead to **lower demand and treatments** among households that believe the drugs are fake
- We used household survey data from Uganda to investigate this

Do households suspect fake drugs?



Do households suspect fake drugs?

- Beliefs about drug quality appear to affect demand
 - When the child is sick in fever, suspecting mothers are:
 - 11% less likely to purchase antimalarial drugs from the private market
 - Use 11% less ACT to treat their children
- Profit-maximizing drug shops may therefore sell (some) authentic drugs in order to not **lose reputation** and future demand

Is learning about quality unbiased?

- Households may partially infer drug quality by observing health outcomes
 - If one treats fever with ACT and **does not quickly feel better**, then either the ACT is fake, or one did not have malaria
 - If one treats fever with ACT and **does feel better quickly**, then either the ACT is authentic, or the fever is a **self-limiting** non-malarial infection
 - Unbiased learning about drug quality depends on whether beliefs about malaria are unbiased

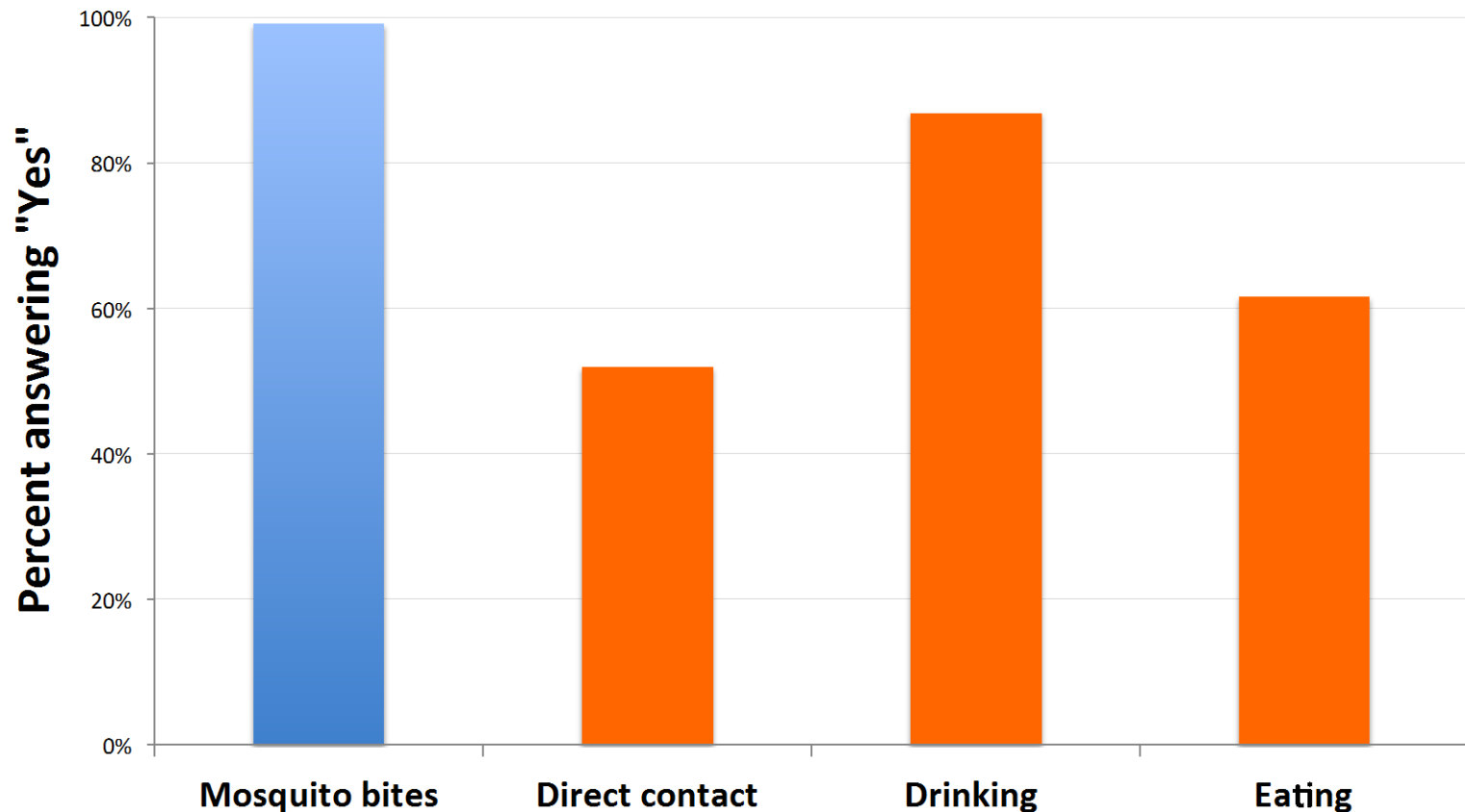


If consumers do not realize fever is often self-limiting, beliefs about drug quality can be upward biased, which private drugs shops can exploit

Is learning about quality unbiased?

Beliefs about Malaria Transmission

Can the following cause malaria?



Is learning about quality unbiased?

- Misconceptions are **positively** correlated with beliefs about drug quality:
 - a. “Naïve” HH with misconceptions are 29% less likely to believe drug shops sell fake ACTs
- Misconceptions in villages are **negatively** correlated with actual drug quality
 - a. One std. dev. increase in the share of “naïve” consumers is associated with a 18.6 pp higher likelihood that an outlet sells fake drugs

Consistent with profit-maximizing drug shops exploiting biased beliefs about malaria and drug quality, without losing reputation

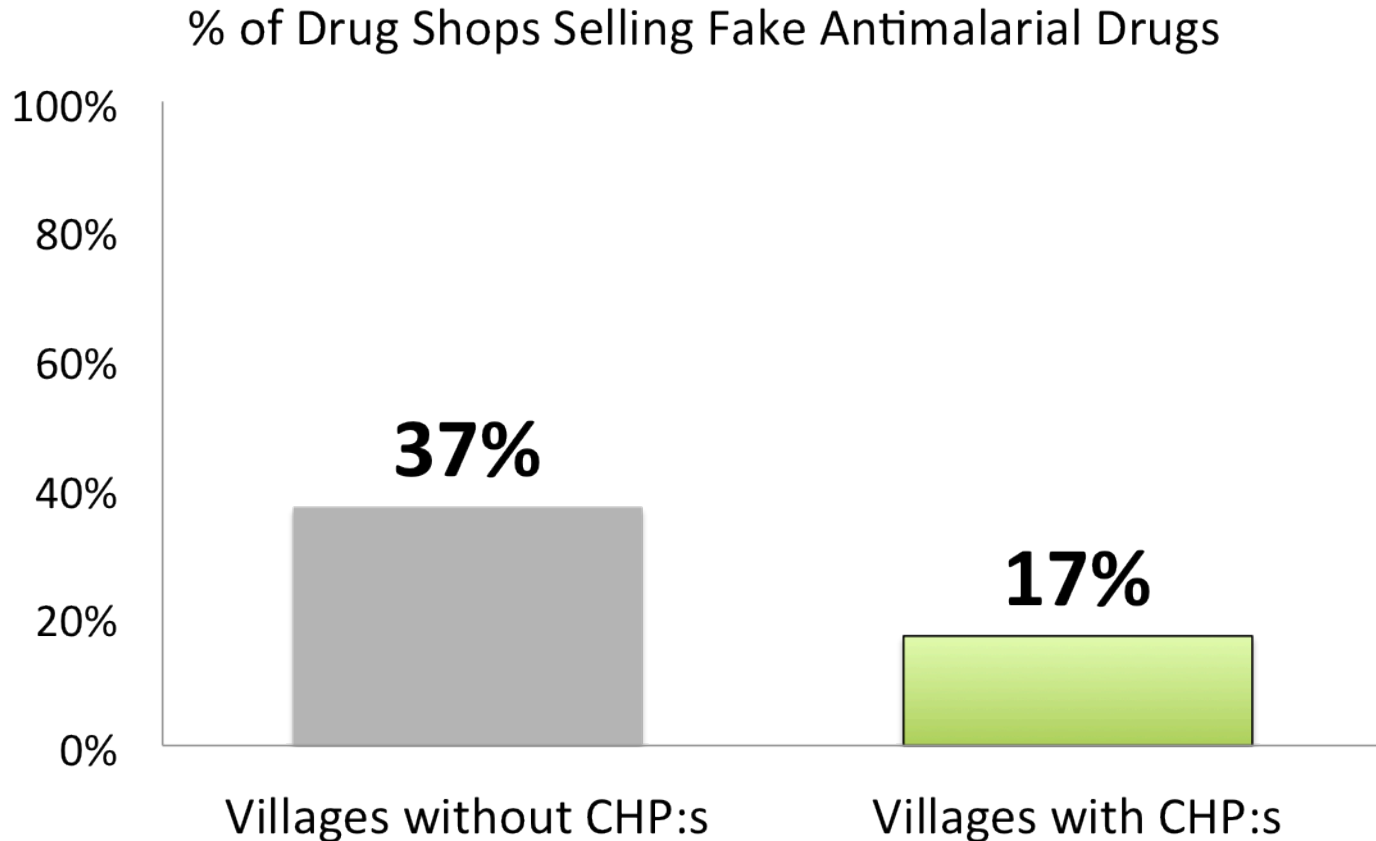
Randomized Experiment

- **NGO Collaboration:** BRAC and Living Goods
- **Intervention: Selling Authentic ACT**
 - Door-to-door Community Health Promoter (CHP) selling at a 20-25% subsidized price
 - ~100 sample villages, half randomly assigned CHP
- **Theoretical Prediction:**
 - NGO entry could **drive out the bad drugs** from private outlets due to the NGO, as **reputation forces are stronger** when consumers can compare health outcomes of NGO-drugs vs. drugs from private outlets
 - The positive externality **depends on extent of malaria misconceptions**

Randomized Experiment

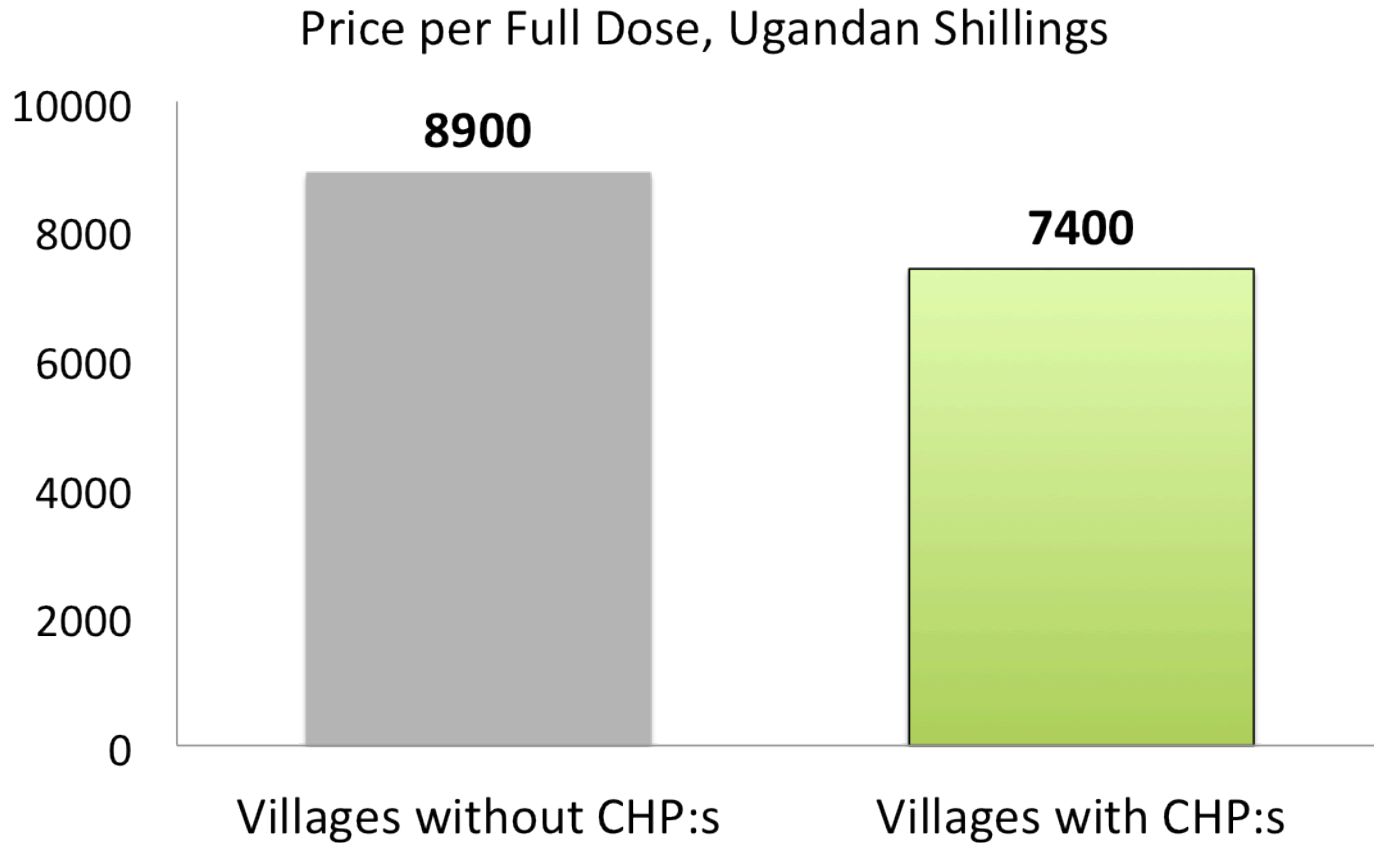


Impact: Drug Quality in Drug Shops



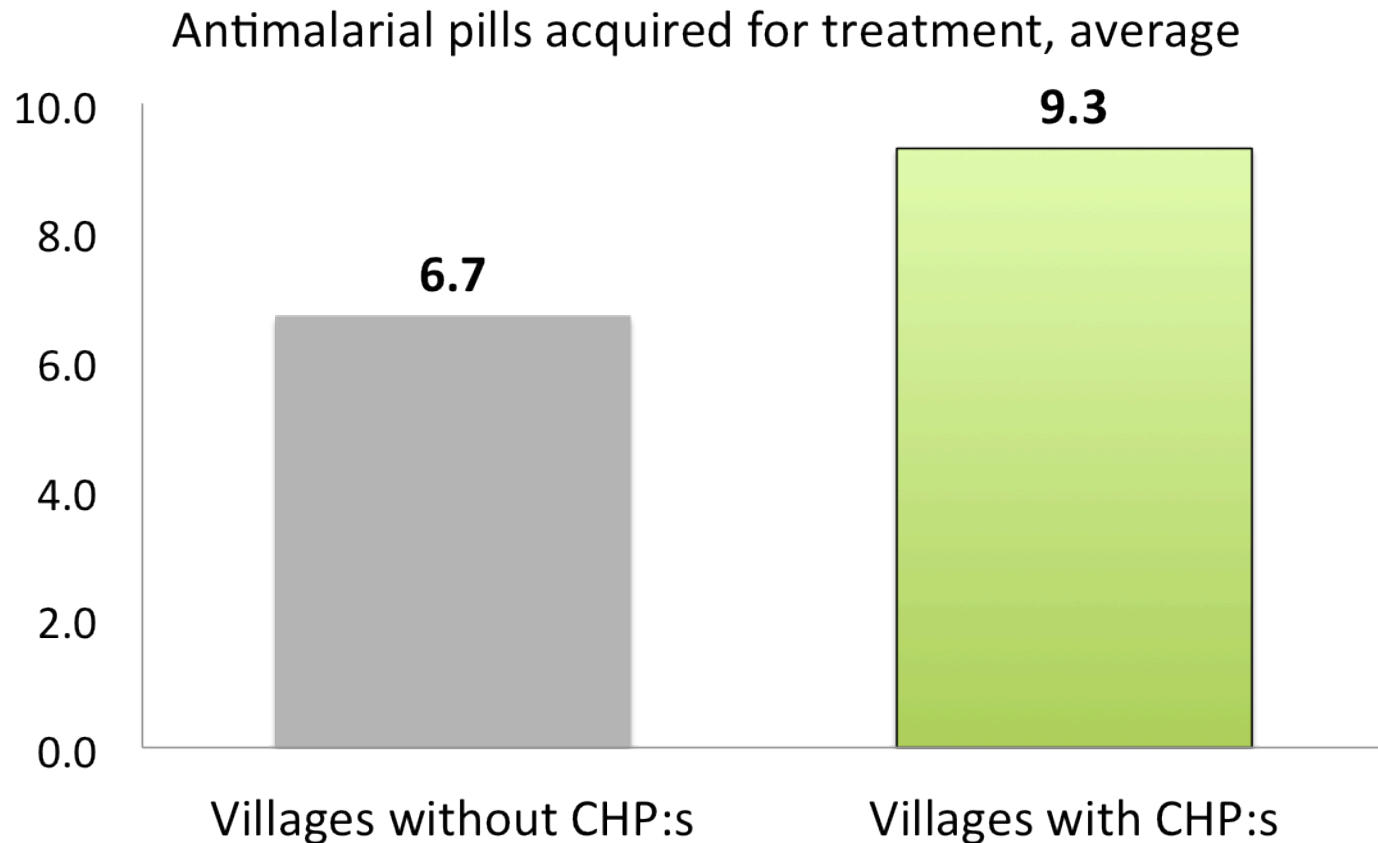
**Program Impact:
20 %-points fewer drug shops sell fake drugs**

Impact: Price in Drug Shops



**Program Impact:
18% lower prices**

Impact: Treatment of Sick Children



Program Impact:
39% increase in antimalarial medicine use

Conclusion and Way Forward

- Evidence of **positive market externalities**: Fake drugs in private outlets can be driven out by the entry of an NGO committed to high quality and low price
 - Effect much weaker in villages with wide-spread malaria misconceptions
- Interventions directly **targeting the retail sector can be highly effective**
- Potential interventions and policies:
 - Technological solutions and certification schemes
 - Health education
 - Better diagnostics (RDT)