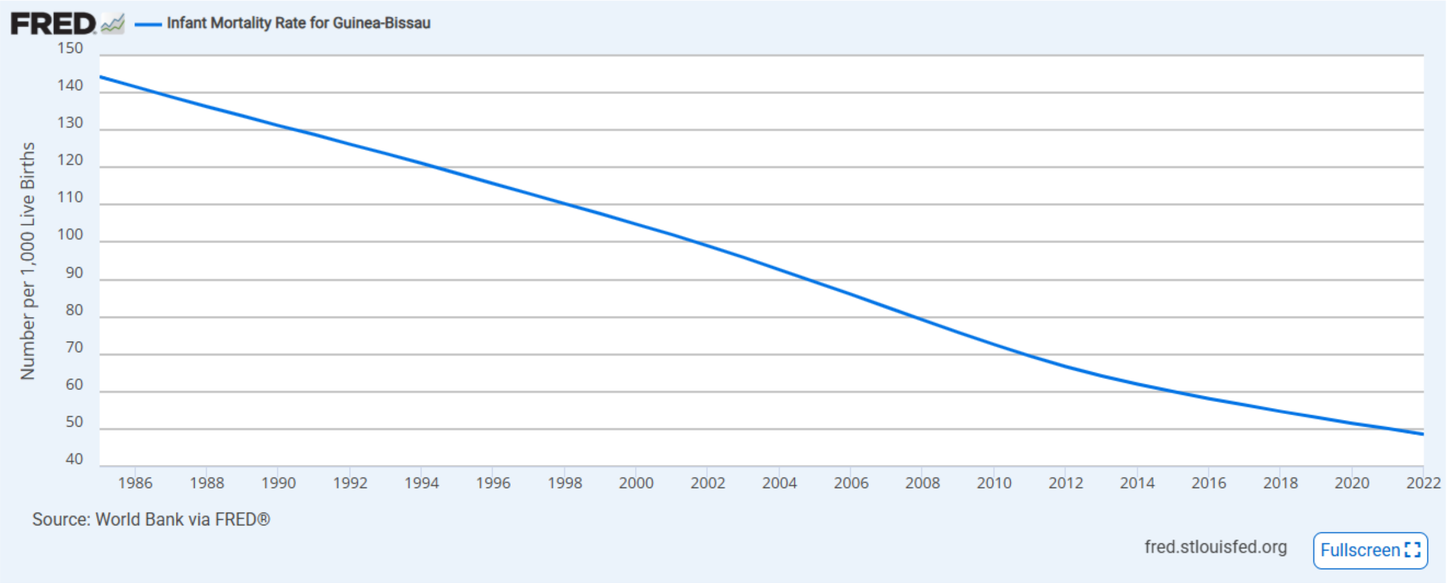
Topic 8: Health

Introduction

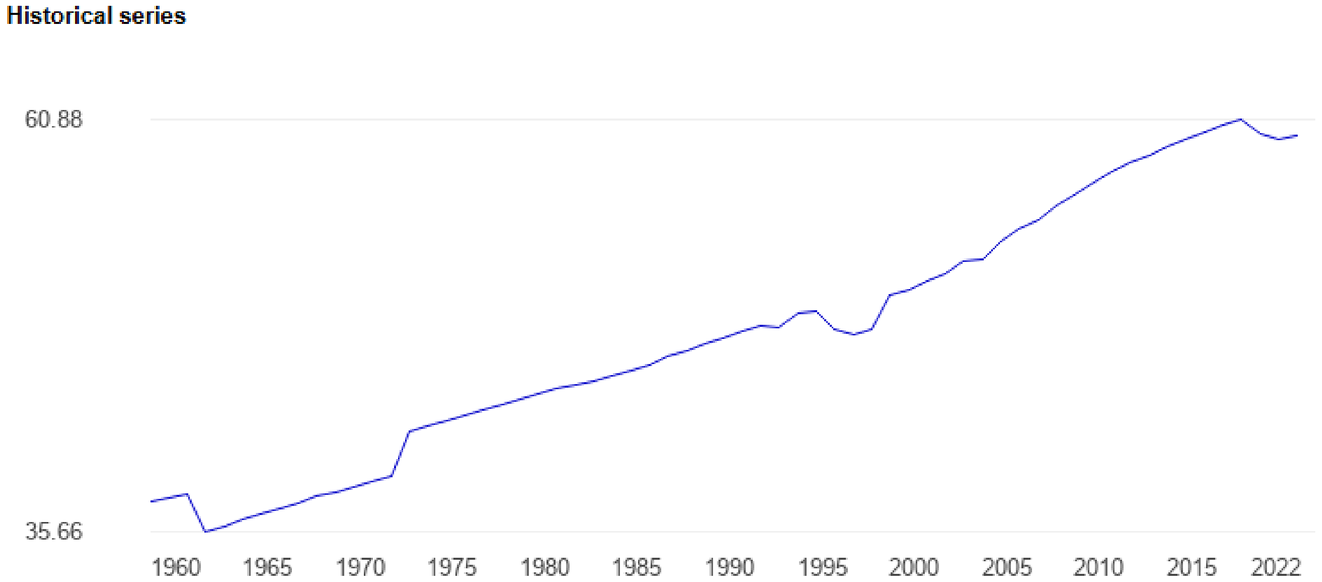
Infant mortality rate, per 1000 live births:
- Portugal: 2.5
- Guinea-Bissau: 48.6 – *35% of rural adult women have lost a child – Coutts et al. (2020)*.

Life expectancy at birth:
- Portugal: 81.6 years
- Guinea-Bissau: 59.9 years.

Infant mortality rate in Guinea-Bissau 1986 - 2022



Life expectancy at birth in Guinea-Bissau 1960 - 2020



Main things to learn

1. **Preventable diseases harming development**: cheap health interventions can substantially improve socioeconomic outcomes (e.g. education) both in the short (Miguel and Kremer 2004) and in the long run (Baird et al 2016).

2. **Cost (sharing) might decrease demand too much**: free distribution of cheap solutions might be cost effective… and save lives! (Cohen and Dupas 2010).

3. **Exogenous incentives motivate pro-social (health) agents**: even in a sector in which there is arguably a strong alignment between interests and mission:
   a. **exogenous incentives (both non-financial and financial – at the right level) motivate workers to exert more effort (Ashraf et al 2014).**
   b. **Training community health agents with financial incentives saves children's lives (Nyqvist et al 2019).**
   c. **Improving social status of pro-social health agents might substantially improve their performance (Fracchia et al 2023).**

4. Space for cooperation with traditional medicine to result in improved health outcomes? High demand and interest by traditional health practitioners (THPs). *Álvarez Pereira et al (work in progress)*.

Low-cost interventions in health

- **Intestinal worms is the most common infectious disease in the world**, affecting an estimated 1.5 billion people in 105 countries (**1/4 of the world population**).
- **Heavy infections** can lead to iron-deficiency anemia, protein-energy malnutrition, abdominal pain, and **listlessness**.
- **Low-cost single-dose oral therapies can kill the worms**, reducing most types of worm infections by 99 percent.

Miguel and Kremer (2004 – Econometrica) - 1

- Miguel and Kremer (2004, Econometrica) evaluate the **Primary School Deworming Project** (PSDP), which was carried out by a Dutch nonprofit organization, ICS, in cooperation with the Busia District Ministry of Health office.

- The project took place in southern Busia, a poor and densely-settled farming region in western Kenya, in an area with the highest worm infection rates in Busia district – **92% of a random sample (attending school) had a least 1 infection by some worm**.

- **The 75 project schools** consist of **nearly all rural** primary schools in this area and had a total enrollment of over 30,000 pupils between ages six to eighteen.

- In January 1998, the seventy-five PSDP schools were **randomly divided into three groups of twenty-five schools each**.

- Due to ICS's administrative and financial constraints, the **health intervention was phased in over several years**:

  - Group 1 schools received free deworming treatment in both 1998 and 1999, Group 2 schools in 1999, while Group 3 schools began receiving treatment in 2001.

Miguel and Kremer (2004 – Econometrica) - 2

Results:

- This paper finds that the **program reduced school absenteeism by at least one-quarter**, with particularly large participation gains among the youngest children, making deworming a highly effective way to boost school participation.

- It finds that **deworming reduces worm burdens and increases school participation among children in neighboring schools** (using treated schools' density).

- Including the externality benefits**, the cost per additional year of school participation is only $3.50**, making deworming considerably more cost-effective than alternative methods of increasing school participation.

Long term impact – Baird et al (QJE 2016):

- **Ten years later**, the program increased **labor supply among men** (+17% hours per week and more qualified jobs) and **education among women** (+25% more likely to have attended secondary school + from subsistence agriculture to more profitable occupations).

- **Annualized Financial Internal rate of return >32%** (doubles every 2.25 years).

Cost-sharing in Health

- It is often argued that **cost-sharing** - charging a subsidized, positive price - for a health product is necessary to **avoid wasting resources on those who will not use or do not need the product**.

- Several arguments in favor of cost-sharing:
  - **Selection effect**: charging a positive price could select out those who do not value the good and place it only in the hands of those who are likely to use it.
  - **Psychological effect**: paying a positive price for a good could induce people to use it more if they exhibited ‘sunk cost’ effects.
  - Higher prices may encourage usage if they are interpreted as a **signal of higher quality**.

Cohen and Dupas (2010 – QJE) - 1

- The authors explore these arguments in a **field experiment** where the **price** at which clinics could sell **antimalarial insecticide-treated bed nets** (ITNs) to **pregnant women** is **randomized**.

Results:

- **No evidence that cost-sharing reduces wastage** on those who will not use the product: women who received free ITNs are not less likely to use them than those who paid subsidized positive prices.

- **No evidence that cost-sharing induces selection of women who need the net more**: those who pay higher prices appear no sicker than the average prenatal client in the area in terms of measured anemia (an important indicator of malaria).

- **Cost-sharing** does, however, considerably **dampen demand**.

  - Uptake drops by 60pp when the price of ITNs increases from $0 to $0.60 (i.e., from 100% to 90% subsidy), a price still $0.15 below the price at which ITNs were sold to pregnant women in Kenya.

  - Overall, results suggest that **free distribution of ITNs could save many more lives than cost-sharing programs**.

Cohen and Dupas (2010 – QJE) - 2

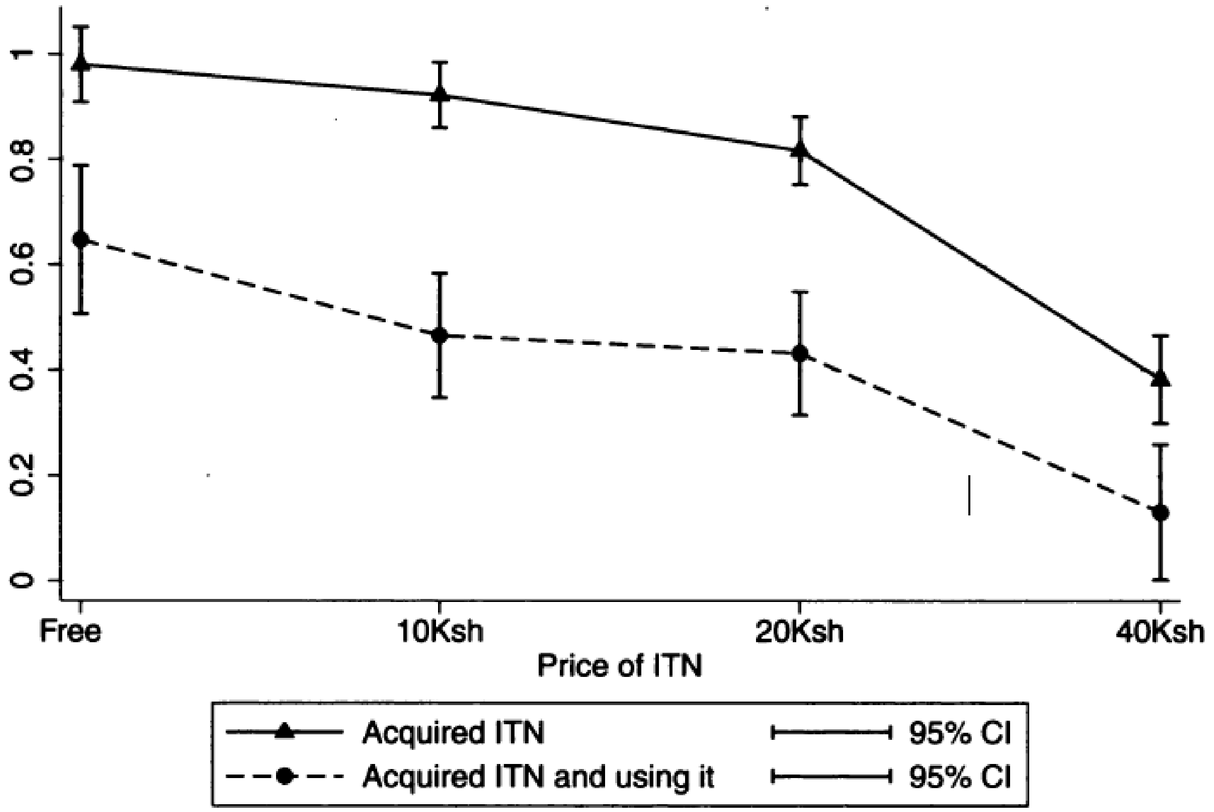


FIGURE I
Ownership vs. Effective Coverage

The preventive health puzzle

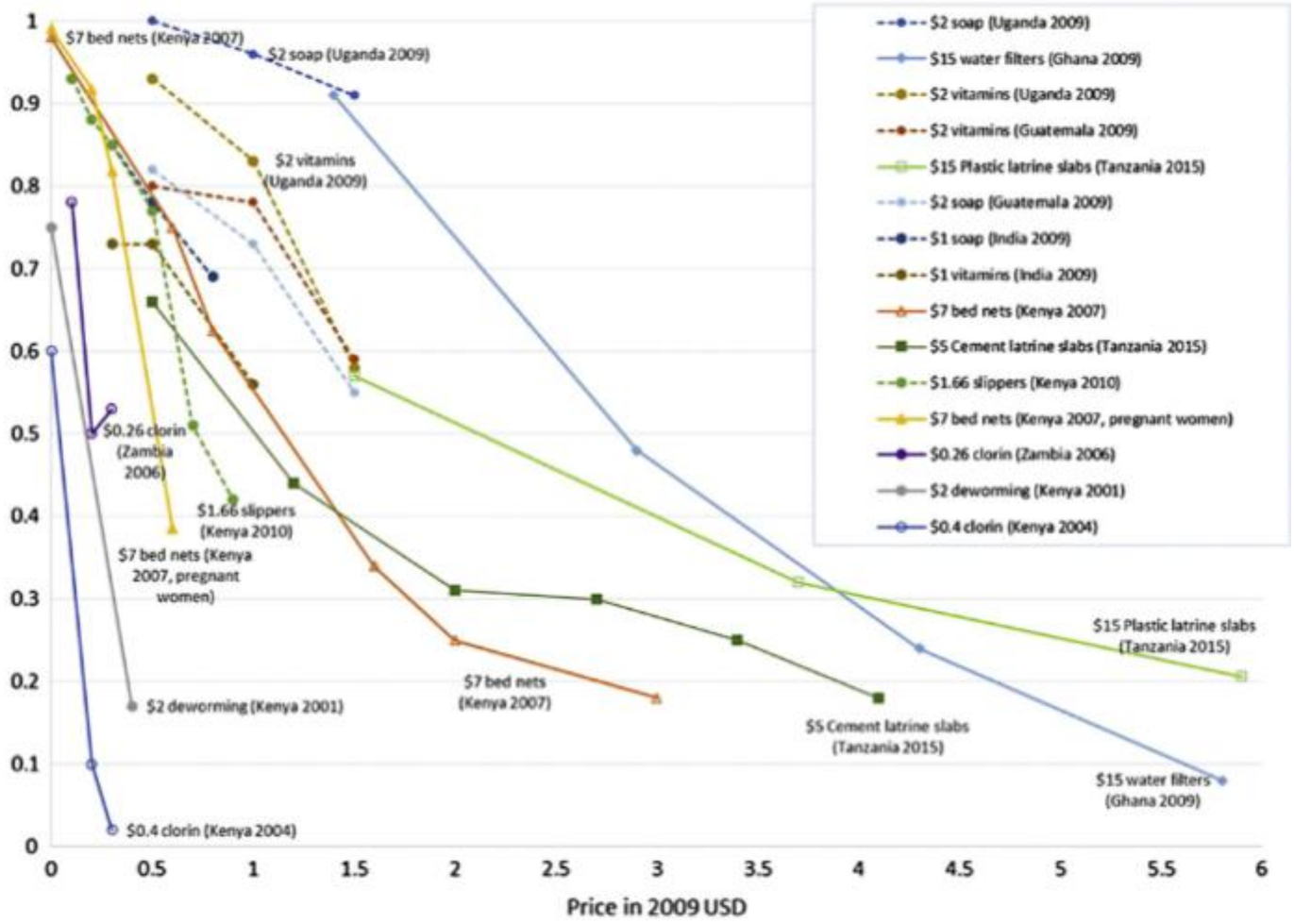


FIGURE 1

Demand for preventative health products. The y-axis plots the share of individuals or households taking up the product.

From Dupas and Miguel (2017)

Ashraf et al. (2014, JPubEcon) – 1

INCENTIVES IN HEALTH 1

- Ashraf et al. (2014, JPubEcon) design a field experiment to evaluate the **effect of extrinsic rewards** on the **performance of agents in a public health organization**. The experiment is designed to compare the effects of monetary and non-monetary incentives.

- Collaboration with a public health organization based in Lusaka, Zambia, which recruits and trains hairdressers and barbers to provide information about HIV prevention and sell condoms in their shops.

- Particularity of this context: **effort in a pro-social task**, that benefits society (not just the employer) – **stronger association between interests and mission**:
  - **Possibility of crowding out intrinsic motivation**.

Ashraf et al. (2014, JPubEcon) – 2

INCENTIVES IN HEALTH 1

- The experiment randomly assigns **205 distinct geographical clusters containing 1222 agents** to one of **four groups** that receive **different rewards based on condom sales**.
- Agents in the control group receive no rewards, while agents in the three treatment groups receive financial margins at the bottom and the top of the feasible range, and nonfinancial rewards.
- The smaller and larger financial-margin treatments pay a 10% and 90% margin on each condom sale, respectively, whereas the non-financial scheme (“star” treatment) gives agents a “thermometer” display, showing condom sales and stamps, with one star stamp for each sale.

Ashraf et al. (2014, JPubEcon) - 3

INCENTIVES IN HEALTH 1

- **Non-financial rewards are effective at promoting sales**: **agents in the star treatment sell over twice as many condoms as agents in any other group**, on average. The estimates are stable throughout the one-year period, thus ruling out novelty effects (from about 12,000 condoms sold per group to over 23,000).
  - Competition for prestige? The effect of the stars treatment is higher in neighborhoods with more participating salons.

- That **financial incentives are ineffective** might be due to **earnings from condom sales being a small fraction of overall earnings**, because both demand for the product and earnings from each sale are low.

- **Financial rewards are effective for the poorest agents in the sample**, for whom the relative value of financial incentives is higher.

Ashraf et al. (2014, JPubEcon) - 4

INCENTIVES IN HEALTH 1

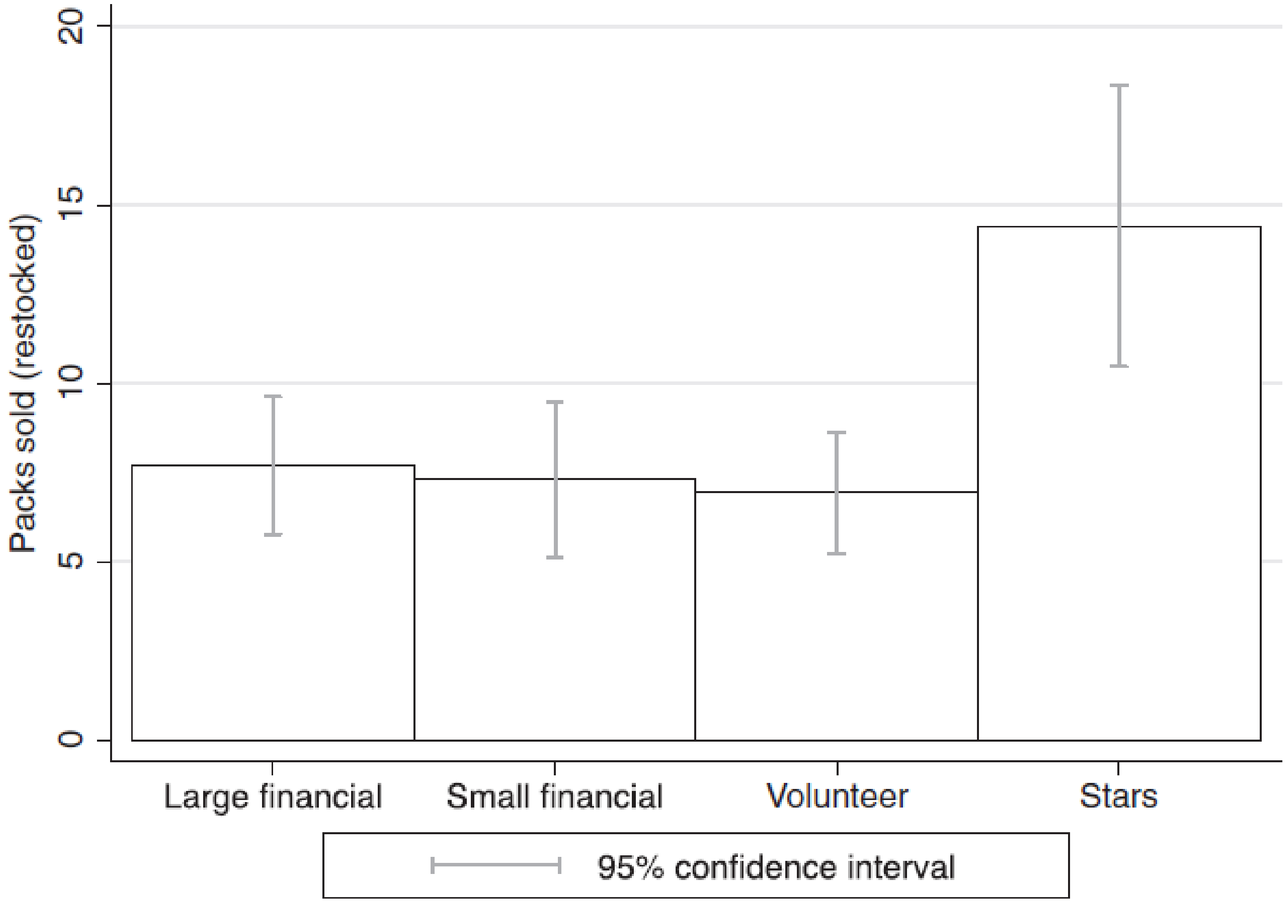
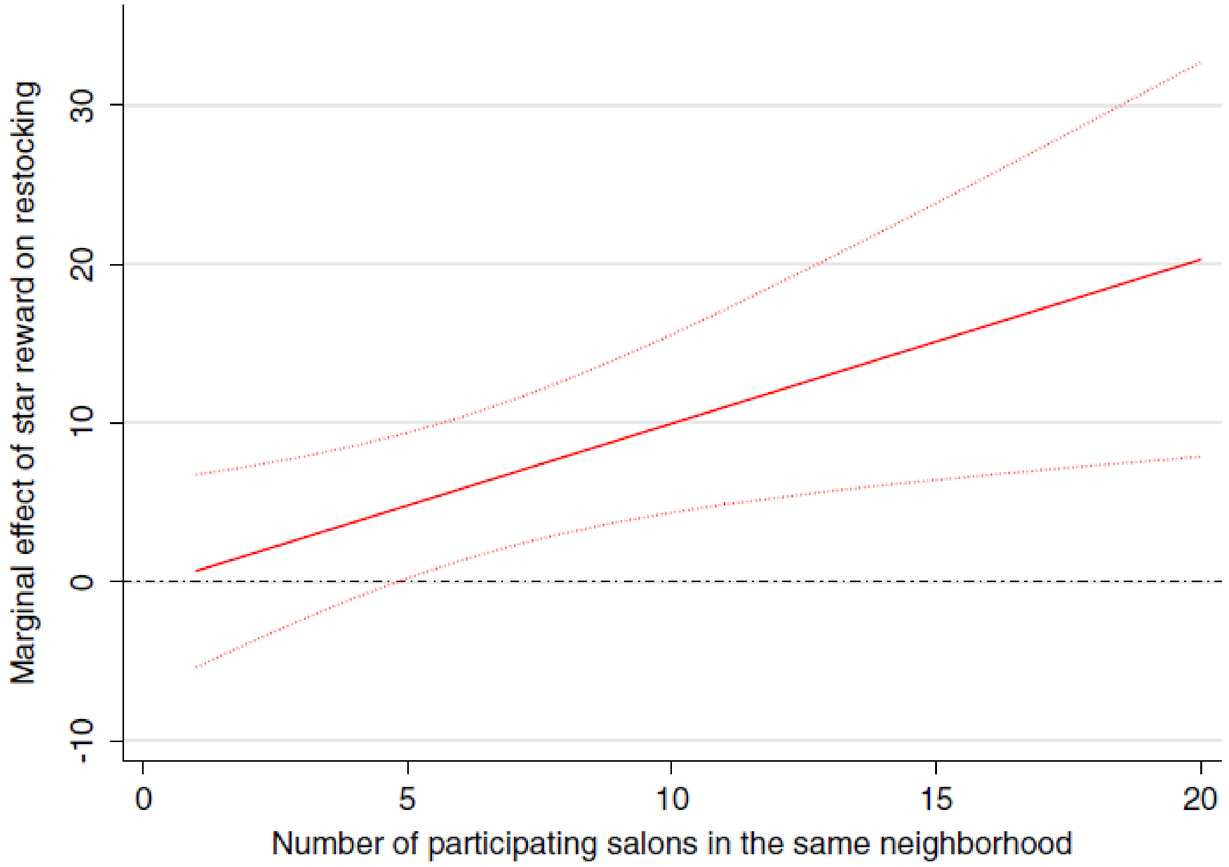


Fig. 2. Average yearly sales by treatment group. Notes: Each bar measures the average number of packs sold over the year by agents in each of the four groups with 95% confidence intervals.

Ashraf et al. (2014, JPubEcon) - 5

INCENTIVES IN HEALTH 1



Nyqvist et al. (2019, AEJ/AE) – 1

INCENTIVES IN HEALTH 2

- They study the impact of a novel **community health** delivery program delivered by **Community Health Promoters** (CHP).
- CHP's main activities resemble the standard activities of any community health worker: **conduct home visits within their community**, **educate** households on essential health behaviors, provide **basic medical advice**, and refer the more severe cases to the closest health center.
- On top of this, the **CHPs make a modest income by selling a diverse basket of basic health goods**, ranging from anti-malaria drugs to soap and fortified foods.
- Thus, the CHPs operated as **micro-entrepreneurs with financial incentives** to meet household demand and improve child health.

Nyqvist et al. (2019, AEJ/AE) - 2

INCENTIVES IN HEALTH 2

- The program was randomized across **214 rural villages spread across Uganda** and was fully operational in all treatment clusters by the beginning of 2011.

- Results **after 3** years show that the program resulted in a **substantial health impact**: in treatment villages, **under 5-years child mortality was reduced by approximately 27 percent**, infant (i.e., **under 1-year) mortality by 33 percent**, and neonatal (i.e., **under 1-month) mortality by 28 percent**, compared to control villages that did not receive the program.

- The evidence shows that households in treatment villages were significantly more likely to **use products sold by the CHPs**, including bed nets and oral rehydration salts.

- They also document large **increases in a number of maternal, newborn, and child health services**, including follow-up visits, and **better knowledge** of basic health issues.

Nyqvist et al. (2019, AEJ/AE) - 3

INCENTIVES IN HEALTH 2

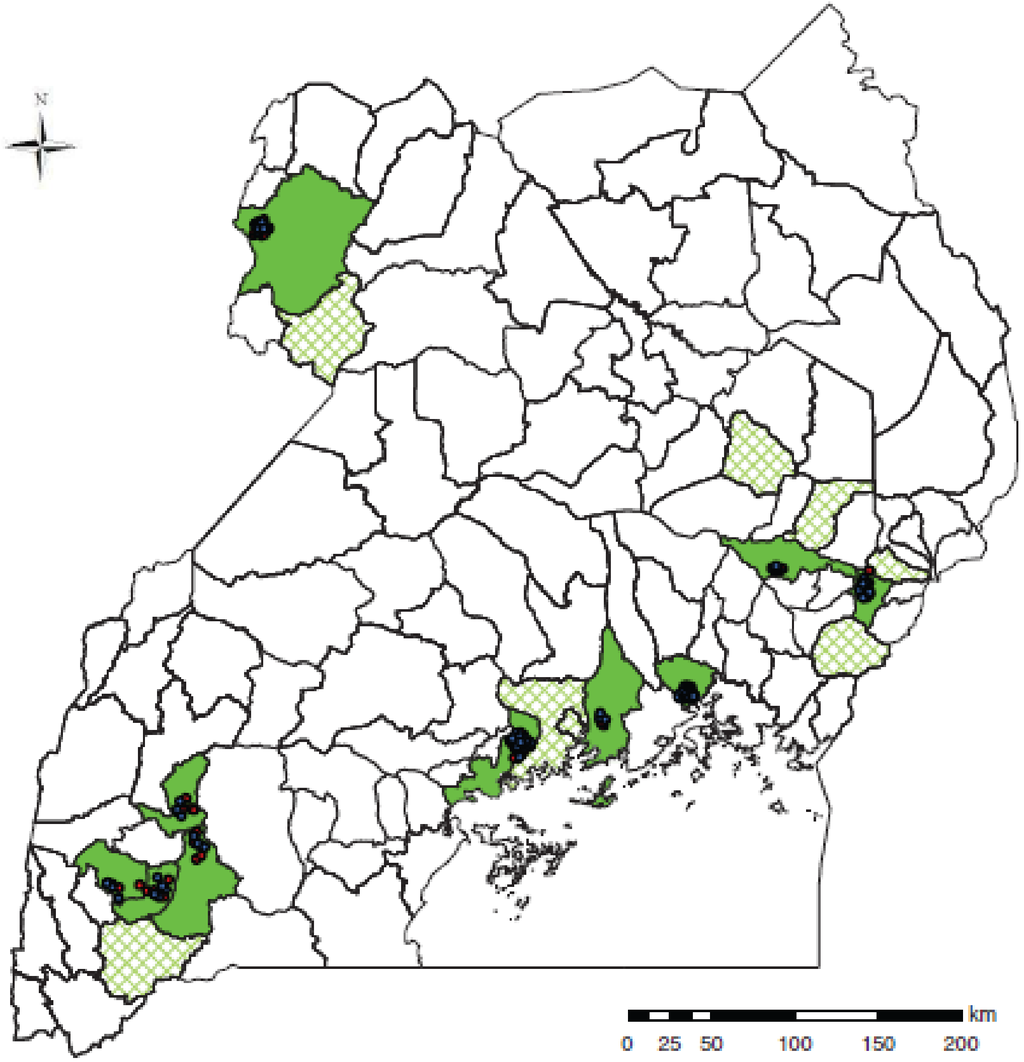


FIGURE 1. MAP OF DISTRICTS AND DISTRIBUTION OF CLUSTERS

Notes: Green fully colored areas indicate districts that were part of the study, while cross-hatched areas indicate districts excluded from the study, but in which the program was also implemented. Red and blue dots indicate, respectively, control and intervention clusters (villages) included in the study. Figure A1 in the Appendix provides a set of more detailed images by study district.

Nyqvist et al. (2019, AEJ/AE) - 4

INCENTIVES IN HEALTH 2

TABLE 3—PROGRAM IMPACT ON CHILD MORTALITY

	Number of deaths			Mortality per 1,000 years of exposure		Mortality per 1,000 births		
	Under-5 deaths	Infant deaths	Neonatal deaths	Under-5 mortality	Infant mortality	Neonatal mortality	Under-5 mortality	Infant mortality
Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Program impact	−0.58	−0.54	−0.29	−5.95	−18.87	−9.27	−19.86	−17.26
	(0.23)	(0.19)	(0.15)	(2.06)	(5.94)	(4.62)	(7.23)	(5.35)
Rate ratio				0.73	0.67	0.73		
				(0.09)	(0.09)	(0.11)		
Mean control	2.08	1.62	1.07	19.4	52.7	33.36	68.4	49.7
Branch FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	214	214	214	214	214	214	214	214
R^2	0.148	0.163	0.162	0.145	0.155	0.135	0.117	0.153

Notes: Program impact measures the coefficient on the assignment to treatment indicator, from a standard OLS regression. Dependent variables: (1) number of under-5 deaths; (2) number of infant deaths; (3) number of neonatal deaths; (4) number of under-5 deaths per 1,000 child-years of exposure to the risk of death; (5) number of infant deaths per 1,000 child-years of infant exposure to the risk of death; (6) number of neonatal deaths per 1,000 births; (7) number of under-5 deaths per 1,000 births; (8) number of infant deaths per 1,000 births. Rate ratios in specifications (4)–(6) are derived from a Poisson model, with branch fixed effects and standard errors clustered by village; the number of observations for those specifications are 11,342 (4), 8,808 (5), and 6,499 (6). Branch fixed effects are included in every regression. There are 12 branches in the sample. Robust standard errors are in parentheses. R^2 refers to the OLS regressions.

Fracchia et al. (2023 – JDE) - 1

INCENTIVES IN HEALTH 3

- Fracchia et al. (2023, JDE) ask how **volunteer, part-time Community Health Workers** (CHWs) can be **incentivized** to do a better job **without employing financial incentives**.

- Specifically, they consider two main possibilities to incentivize CHWs.
  1. **Improving the social status of CHWs** in their communities.
  2. **Increasing the perceived task significance** of CHWs.

- They follow the full contingent of 1,015 CHWs in Bissau, the capital city of Guinea-Bissau during 2017-2019. RCT.

Fracchia et al. (2023 – JDE) - 2

INCENTIVES IN HEALTH 3

- **Social status intervention**: honorific **awards** for good performance.
  - Ceremonies with the presence of local authorities and representatives of international organizations.
  - Text messages to households in the neighborhood.

- **Task significance**: visualization of a video showing the extent to which CHWs' actions improve the welfare of the member of their communities.

Figure C2: Social status award

Fracchia et al. (2023 – JDE) - 4

INCENTIVES IN HEALTH 3

- The main result is that the **social status intervention improved the performance of CHWs and household health**.

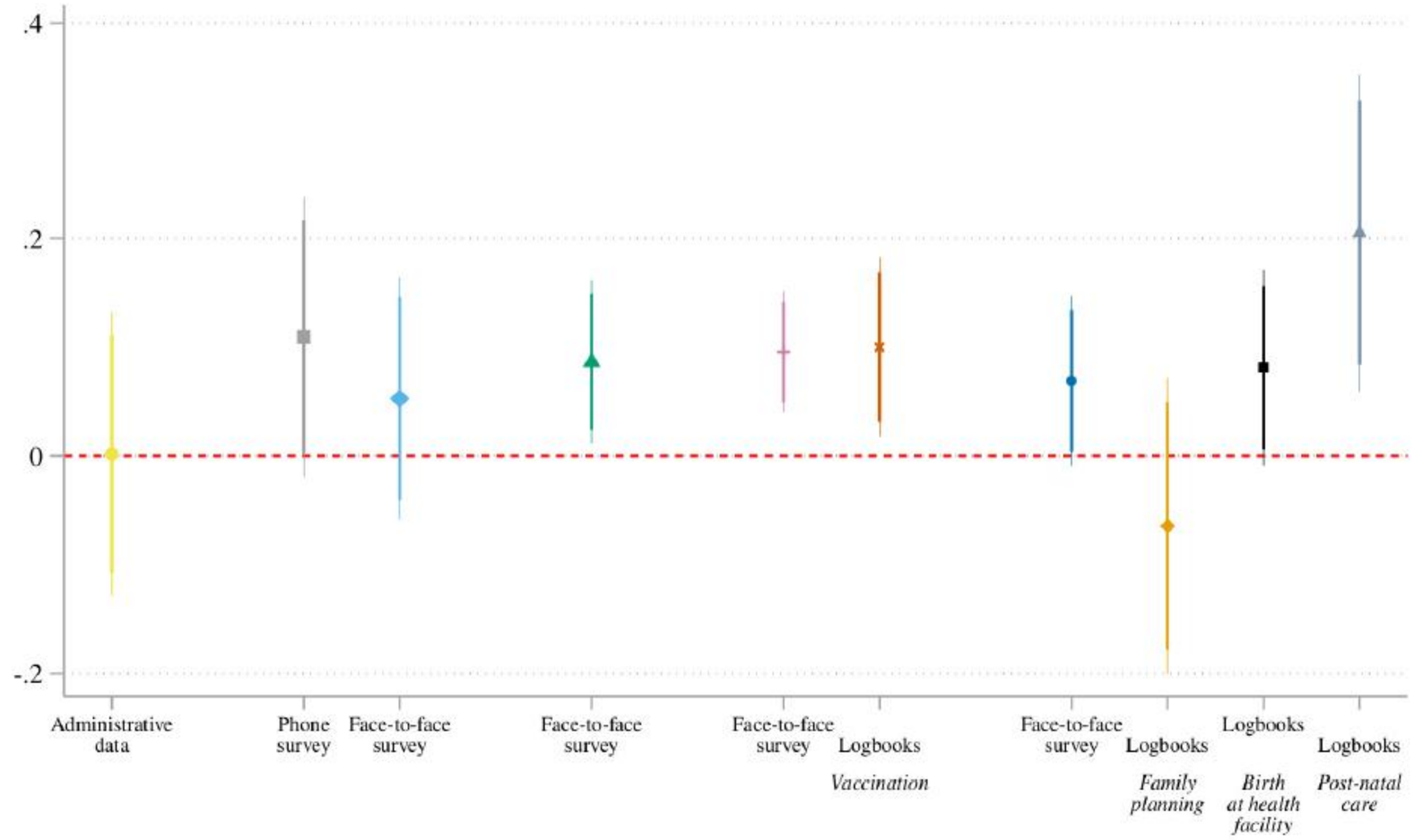
  - Better performance in a wide range of tasks, **including incentivized and non-incentivized activities**, i.e., beyond those considered for the honorific awards.

- **No systematic treatment effects for the task significance video**. The exception is a positive impact on vaccination of children under 5 years old.

Fracchia et al. (2023 – JDE) - 5

INCENTIVES IN HEALTH 3

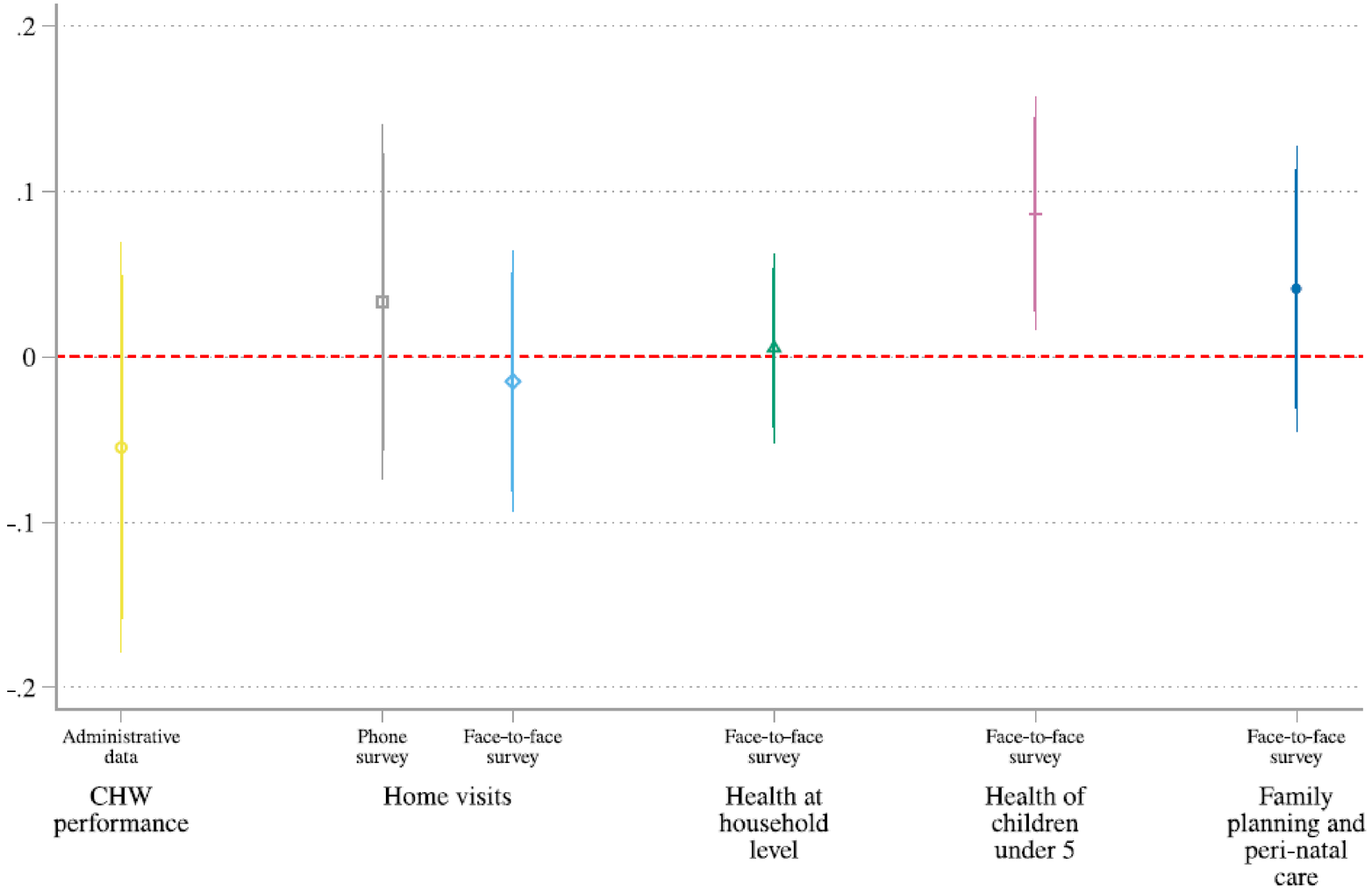
Fig. 1. Main treatment effects – aggregated outcomes employing z-scores – Social status.



Fracchia et al. (2023 – JDE) - 6

INCENTIVES IN HEALTH 3

Fig. 2. Main treatment effects – aggregated outcomes employing z-scores – Task significance.

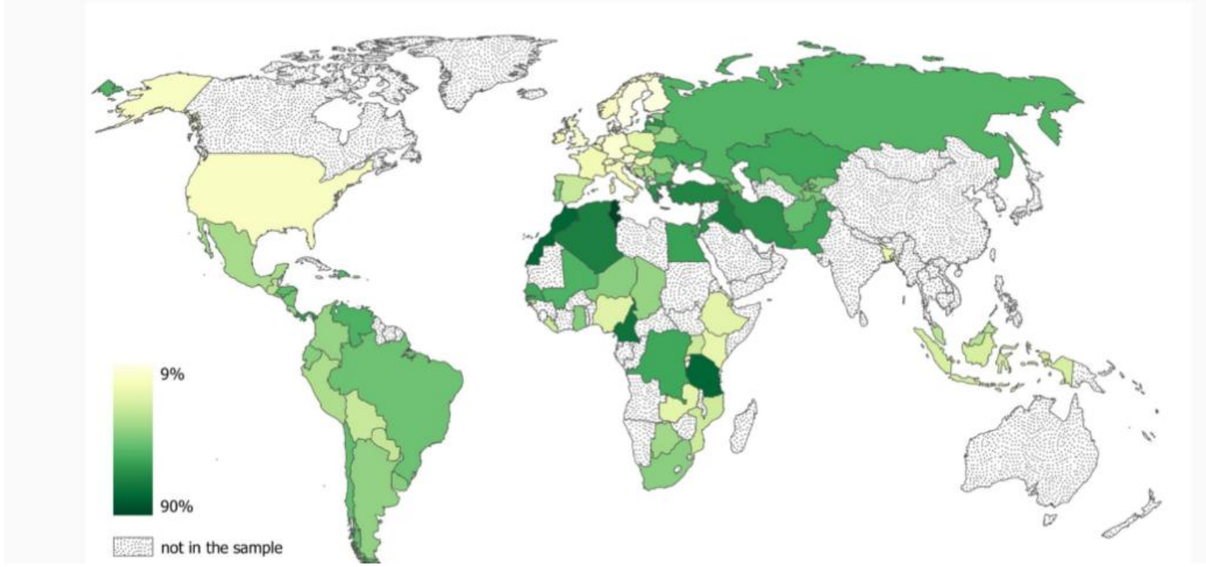


Traditional health

- Scarce resources + preventive health puzzle (Dupas and Miguel, 2017).
  - **Biased beliefs as one core cause of low investment in health?**

- 2 doctors per 10,000 people and challenges in coordinating and incentivizing community health workers:
  - Can we use **the availability and high demand for traditional health practitioners** (about 60 per 10,000 people) **to improve** the reach (supply and demand) of **–modern- health services**?

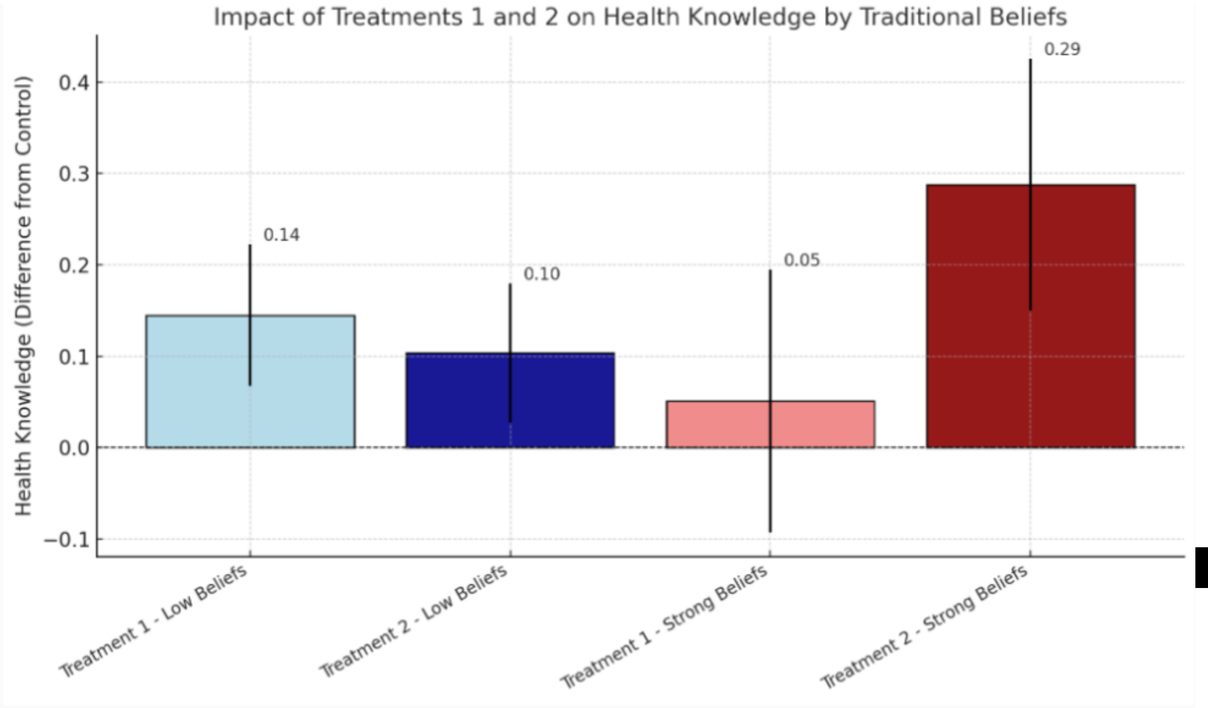
Do you believe in the evil eye, or that certain people can cast curses or spells that cause bad things to happen to someone? [Gershman (2022)]



Àlvarez Pereira et al (2025 – work in progress)

TRADITIONAL HEALTH 1

- RCT in 180 villages – information campaigns promoting maternal and child health.
- Two treatment arms: 2 nurses vs 1 nurse and 1 traditional health practitioner (THP).
- Including a traditional health practitioner in the campaign:
  - **Improved health knowledge more**, specially for mothers with strong traditional beliefs.
  - Increased **trust in traditional practitioners**.
  - Increased **prenatal visits to the health center more**, for mothers with strong traditional beliefs.

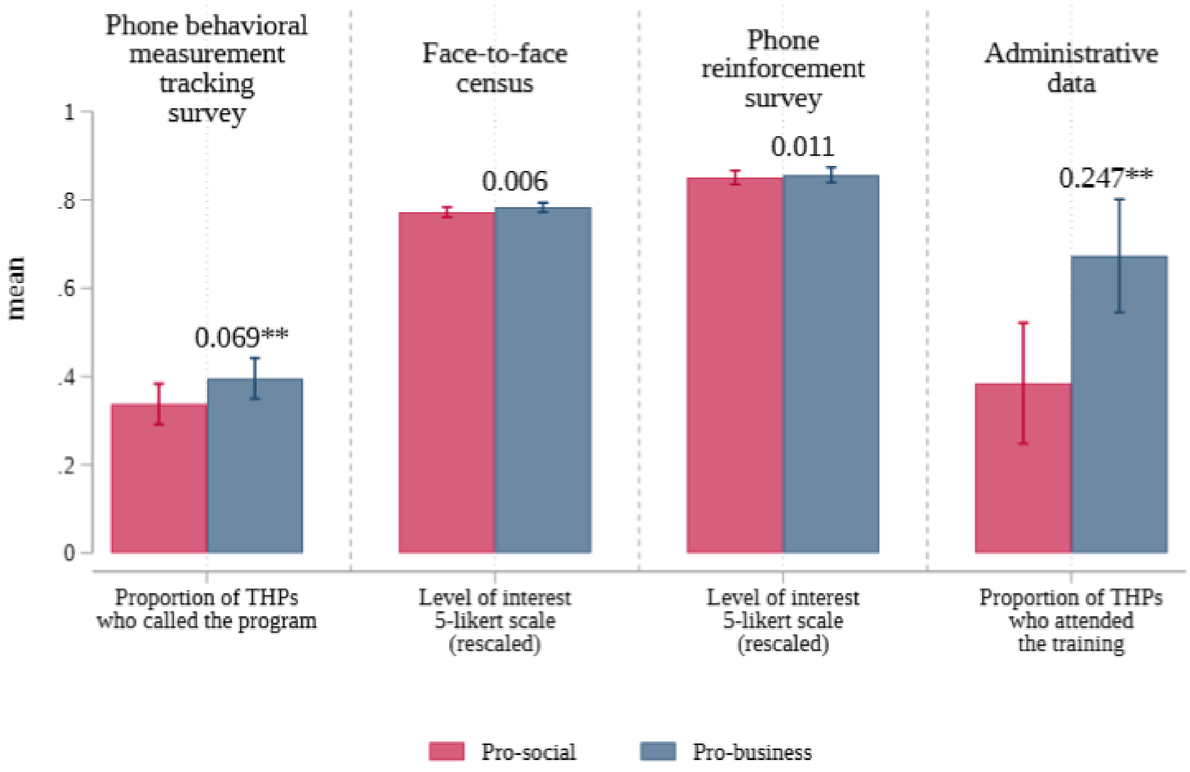


Àlvarez Pereira et al (2026? – work in progress)

TRADITIONAL HEALTH 2

- After finding that it is feasible to collaborate with THPs: **RCT to explore whether they can formally collaborate with the formal health sector** / play the role of community health workers.
- First paper on selection: THPs **much more likely to participate** in the program **when the invite appeals to their improved business prospects** – as compared to improving lives in their community.
- Next steps: complete training and test their behavior as community health agents – referral to health centers.

Figure 2: Interest in participating in the program.



A revision of main findings

1. High prevalence of preventable diseases harming development.

2. Demand of preventive health solutions decreases really fast with their cost.

3. Exogenous incentives motivate pro-social (health) agents – but resources are scarce.

4. Space for cooperation with traditional medicine to result in improved health outcomes? An open question.

Thanks for your attention and contributions!