# Can Cash Transfers Save Lives? Evidence from a Large-Scale Experiment in Kenya

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# Introduction

- Cash transfers continue to grow in popularity as a poverty alleviation tool, with documented direct economic benefits for recipients (Bastagli et al. 2016)

$\Rightarrow$ Can unconditional cash transfers (UCT) generate positive intergenerational effects, in particular, **causal reductions in child mortality**?

- Recent observational cross-country evidence that expanding cash transfer programs is associated with lower under-5 mortality (Richterman et al. 2023)

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- Recent observational cross-country evidence that expanding cash transfer programs is associated with lower under-5 mortality (Richterman et al. 2023)

- Big current debate in economics: **are cash transfers enough?** Or are they largely ineffective in the absence of complementary public goods or behavioral changes?

# This paper

- Analyze a randomized controlled trial (RCT) of a large-scale cash transfer program among 300,000 people in 653 villages in rural western Kenya by the NGO “GiveDirectly” in 2015-17, a major funder of direct cash transfers (via mobile money)
  - Previous work found these cash transfers generated short-term gains for recipient households **and** substantial gains for neighboring firms and households (Egger et al. 2022, *Econometrica*);

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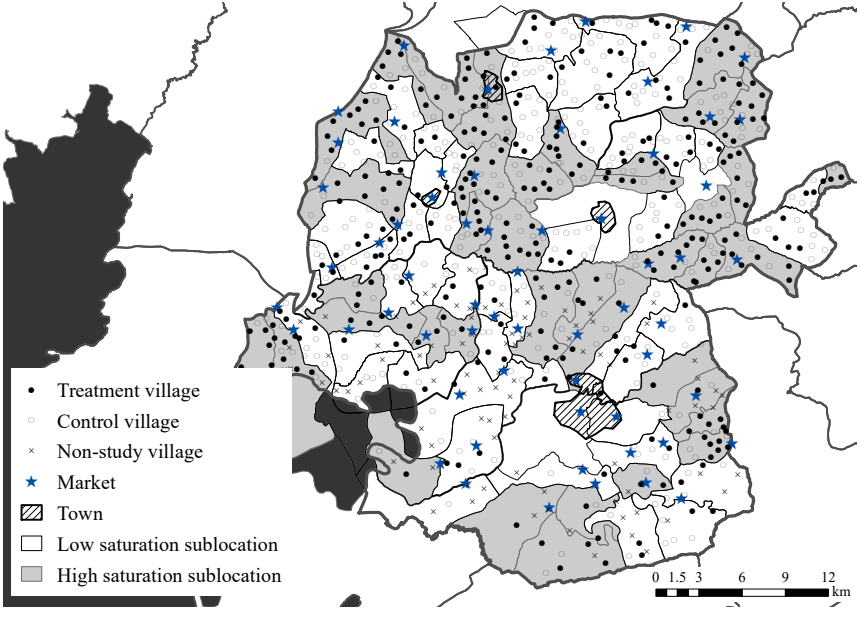
- **New data** for this paper
  ⇒ Conducted a household census – covering 64,000 households – to collect
  1. Full birth histories and child survival for all female household members for 2011-2023
  2. Verbal autopsies (VA) for all under-5 deaths to understand causes.

  ⇒ New round of survey data (10,000 households) to get additional details on birth experience (including costs, delivery location, antenatal care, etc.)

# Two-level experimental design (Siaya, Kenya)

- Randomization at village **and** sub-location levels facilitates estimating spillover effects



# Unconditional Cash Transfer Program

GiveDirectly distributes one-time unconditional cash transfers in treatment villages as follows:

- Enrolls roughly the poorest 1/3 of households in each village using a simple proxy means test (here, having a grass-thatched roof)
- Transfer are very large: USD 1,000 nominal / $\approx$ USD 1,871 PPP in 2015 (2,500 PPP 2025)
  - Equivalent to **75% of mean annual household expenditure**
  - Over USD 10M cash distributed in program $\Rightarrow$ $\sim$16% of annual GDP in treated areas
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$\Rightarrow$ 1.5 years later, **large impacts on consumption (13%) & assets (26%) for recipient households,** spillover benefits to non-recipient households, minimal price inflation (Egger et al. 2022)

# Focus Today: Child Mortality Impacts

- How did receipt of a large cash transfer affect child survival?
- Kenya has relatively good health care access (by East African standards) but delivery is still expensive at better equipped facilities like hospitals with physicians (at over US$100)

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- From April to November 2023, 64,000 households completed the third endline census (EL3) – 92% of all households in the study area; over 90% of households surveyed in the 2014 baseline census were successfully tracked in the census, balanced across treatment arms

- **Analysis sample: over 100,000 total births** recorded over the 2011-23 period, with information on child deaths, as well as cause of death (via verbal autopsy).

# Empirical Strategy for Child Mortality Analysis

**Pre-specified primary outcomes** of interest on AEA RCT Registry (#AEARCTR-0000505):

- Infant (under-1) mortality (IMR)
- Child (under-5) mortality (U5MR)

- Following the methods in Egger et al (2022), estimate:
  (1) reduced-form effects (e.g., indicators for treatment village, high saturation sublocation)
  (2) spatial instrumental variables (IV) specifications that exploit all local variation in cash transfer exposure (within 2 km, the data-chosen radius for economic impacts)
- Control for year of birth, birth gender, the interaction between year of birth and gender, and maternal age group (pre-specified; not sensitive to these choices)

# Empirical Strategy: Reduced Form

We first estimate the following reduced-form specification to assess impacts on recipient households tracked to our baseline census ("recipient baseline households"):

$$\begin{aligned} y_{imhvs} &= \alpha_1 Treat_v + \alpha_2 HighSat_s \\ &\quad + \lambda_{t(i)} + \rho_{g(i)} + \lambda_{t(i)} \times \rho_{g(i)} + A_m + \delta M_i + \epsilon_{imhvs} \end{aligned} \tag{1}$$

where $y_{imhvs}$ is an outcome of interest for a birth $i$, for mother $m$, in household $h$, in village $v$ and sublocation $s$ (at baseline), $Treat_v$ is an indicator for village v assigned treatment, $HighSat_s$ is an indicator for sublocation $s$ assigned high saturation (i.e., two-thirds of villages being treated in $s$).

# Empirical Strategy: Spatial IV

To capture the full spatial dimension of spillover effects, estimate the following specification (based on Egger et al. 2022 and building on Miguel & Kremer 2004), where the local cash transfer amounts *Amt* are instrumented with experimental treatment assignment:

$$y_{imhvs} = \beta_1 Amt_v + \sum_{r=2}^{\bar{R}} \beta_r Amt_{v,r}^{-v} \tag{2}$$

$$+ \gamma_1 ShareElig_v + \sum_{r=2}^{\bar{R}} \gamma_r ShareElig_{v,r}^{-v} \tag{3}$$

$$+ \lambda_{t(i)} + \rho_{g(i)} + \lambda_{t(i)} \times \rho_{g(i)} + A_m + \delta M_i + \epsilon_{imhvs}$$

First-stage relationships are strong (F-stats>100). Conley spatial SEs, similar inference with different clustering approaches (i.e., by sublocation). Multiple hypothesis testing pre-specified for the two primary outcomes across main analyses.

# Results: Cash transfers and infant mortality (reduced form)

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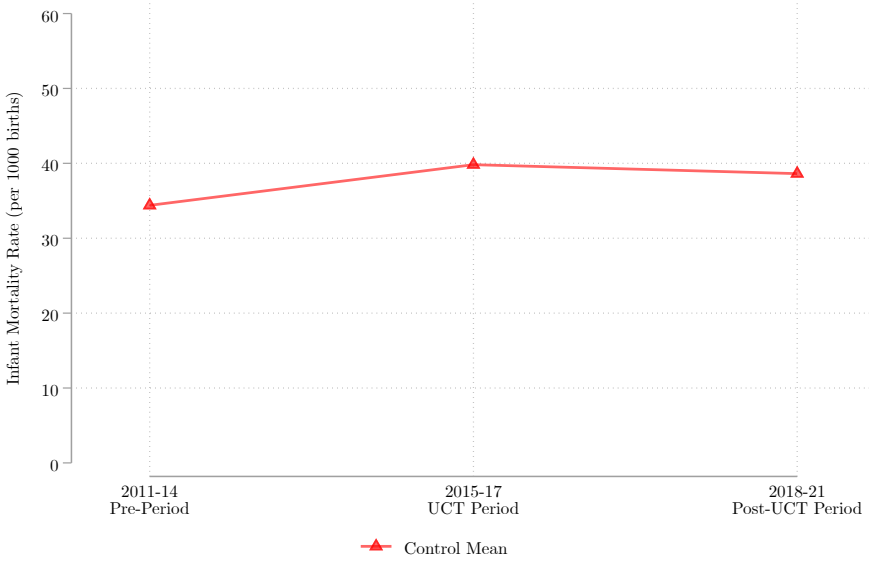

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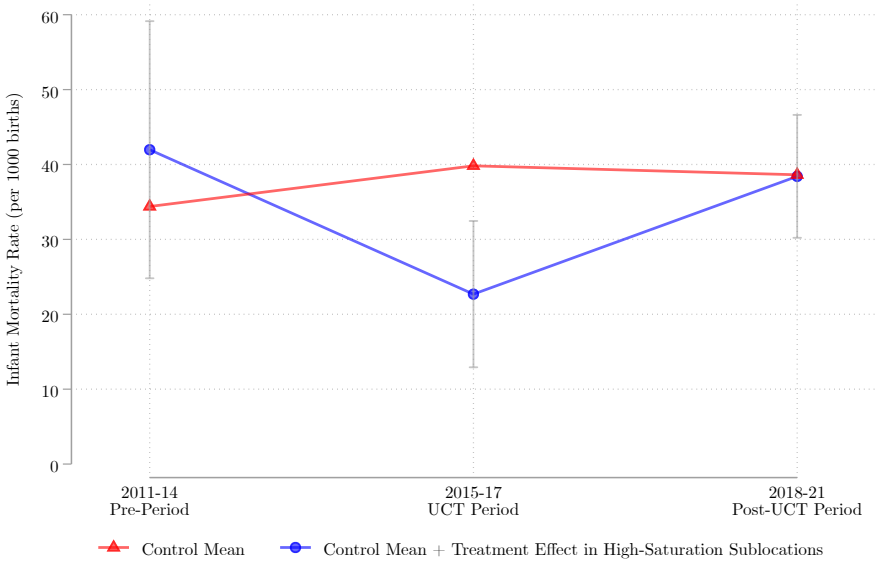
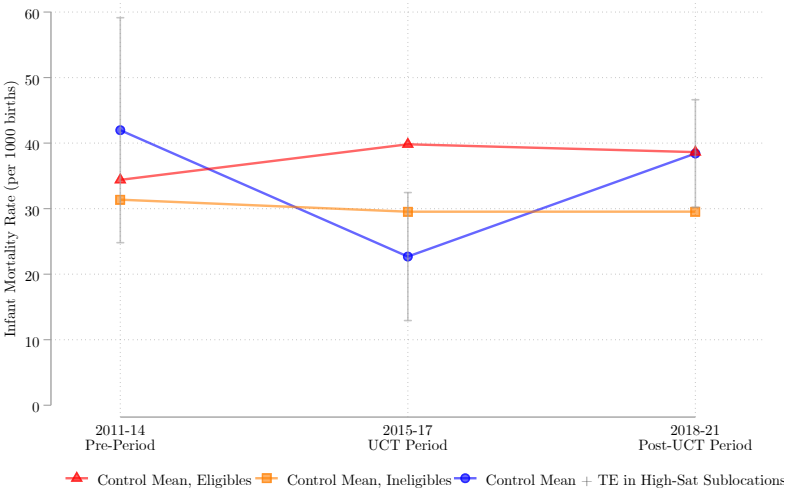



$\Rightarrow$ UCT Period: infant mortality $\downarrow$ 45% (17.9 deaths/1000, SE 4.93), child mortality $\downarrow$ 30%

# Results: Cash transfers and infant mortality (reduced form) ▸ Annual




⇒ UCT Period: infant mortality ↓ 45% (17.9 deaths/1000, SE 4.93), child mortality ↓ 30%

# Results: Impacts on eligibles

Excluding Stillbirths | Secondary | Survival plots | Non-recipients

| | Reduced-Form | | Spatial IV | |
|---|---|---|---|---|
| | (1) Infant Mortality | (2) Child Mortality | (3) Infant Mortality | (4) Child Mortality |
| Own village | -5.74 | -11.96* | -7.98* | -12.72** |
| | (5.85) | (6.38) | (4.82) | (5.55) |
| MHT adjusted p-value | [0.234] | [0.110] | | |
| High-saturation spillovers | -12.13** | -5.68 | -11.49* | -12.91 |
| | (5.04) | (6.66) | (6.84) | (8.12) |
| ATE in high-saturation sublocations | -17.87*** | -17.64*** | -19.46*** | -25.63*** |
| | (4.94) | (5.86) | (6.94) | (8.54) |
| MHT adjusted p-value | | | [0.044] | [0.036] |
| Percent reduction in HS sublocations | 44.44% | 30.75% | 48.40% | 44.67% |
| Control Mean | 40.21 | 57.37 | 40.21 | 57.37 |
| Observations | 6,317 | 6,318 | 6,317 | 6,318 |

*Notes:* * $p < .10$, ** $p < .05$, *** $p < .01$. Reduced form SEs clustered at sublocation level. Spatial HAC SEs (Conley 2008) with 10km cutoff reported for IV. MHT corrected p-values in brackets. ATE in high-intensity villages equals average total effect of own-village estimates and spillovers in high-saturation sublocations.

# Comparison with non-experimental variation

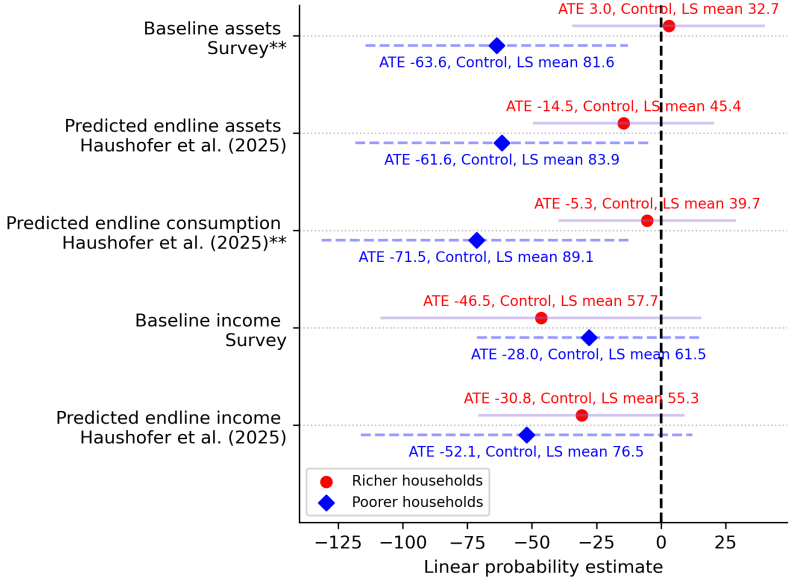
Benchmark these experimental estimates – drops of 40 to 50% in infant and child mortality – against several sources of non-experimental variation in economic circumstances:

1. Cross-country association between income and health ▸ Figure
2. Cross-sectional variation ▸ Figure
3. Intertemporal seasonal variation ▸ Figure
4. Aggregate economic shocks (drought and COVID-19) ▸ Figure
5. COVID-19 lockdown using exact date of birth ▸ Figure

Non-experimental studies: transfers in low-income settings associated with declines in IMR from 14-30% (Lim et al. 2010, Barham 2011, Ramos et al. 2021, Richterman et al. 2023).

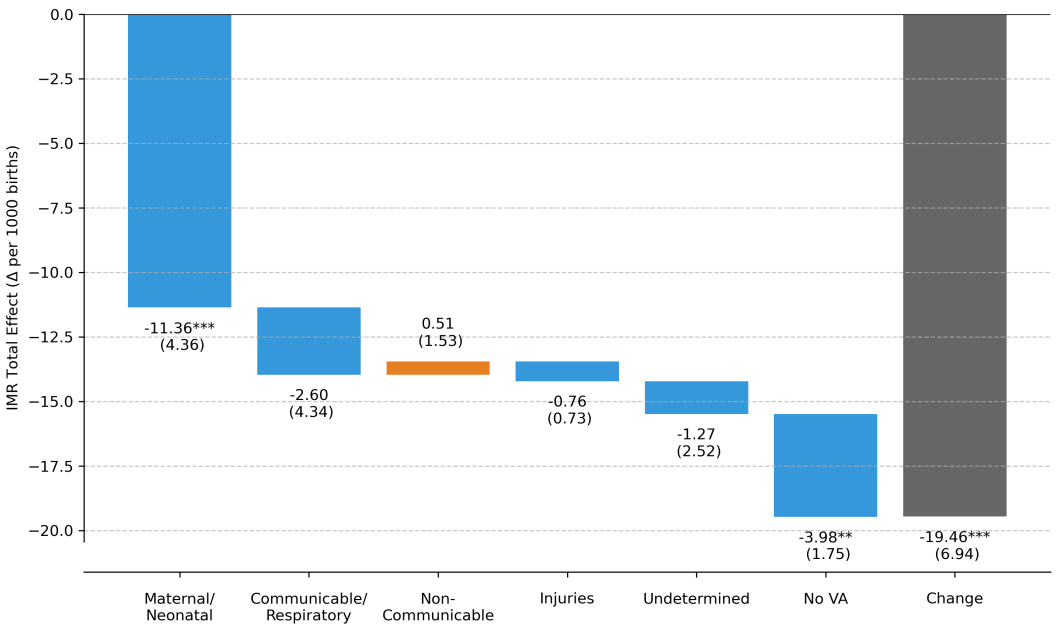
Across experimental and non-experimental estimates, **child mortality appears highly sensitive to economic conditions in low-income settings.**

# Infant mortality reductions largest among the poorest households




*Notes:* Poorer households average assets: $240. Richer: $1,117. Stars denote significance of interaction. * $p < .10$, ** $p < .05$, *** $p < .01$.

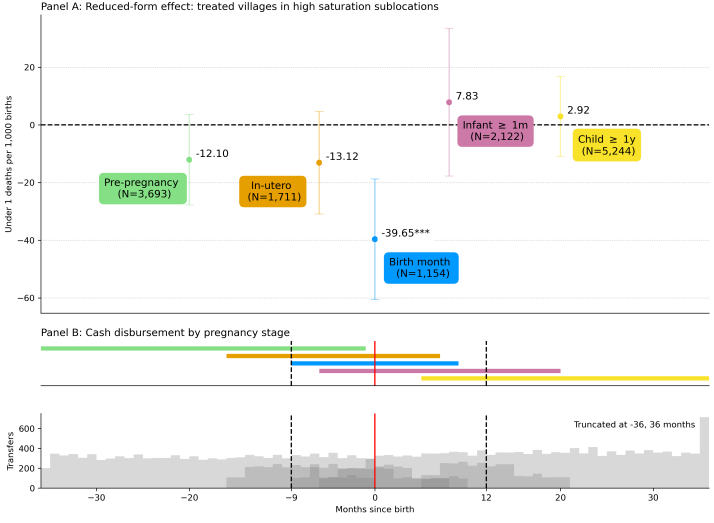
# Verbal autopsy data: Sharp drop in birth complications, neonatal deaths




*Notes:* Control means are 15.80 (maternal/neonatal), 10.70 (communicable/resp.), 2.55 (non-commun.), 0.51 (injuries), 7.65 (undetermined), 4.59 (no VA).

# Large gains among women receiving cash in the birth month

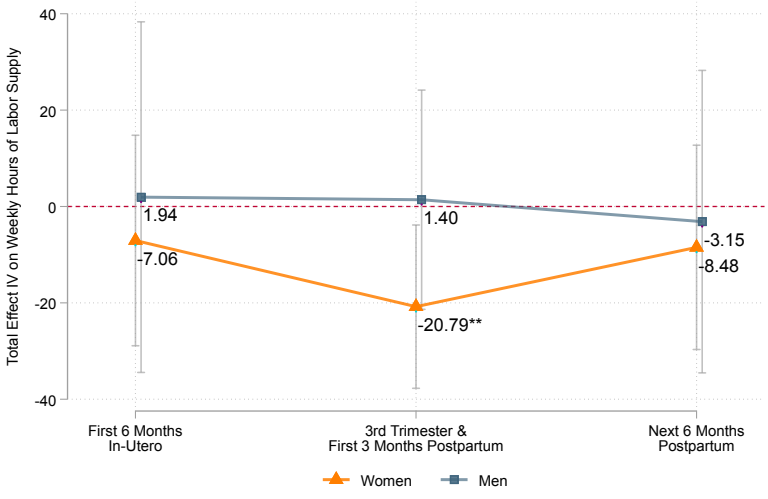
Spatial IV | U5-Fig | Regression




- Significant increase in likelihood of hospital delivery (+20pp on base of 44%)

# Impact on Female Labor Supply for Surveys Around Birth

Back Male




*Notes:* The control means are 40.79 (women) and 46.50 (men). N=876 (women) and N=659 (men).

- **Nutrition** (mother, child): household food expenditures up 9%, index of child food security up 0.17 SD units (Egger et al. 2022)

# Interpreting the results

- Recall errors seem unlikely to bias main effects ▸ Slide
- Patterns appear inconsistent with experimenter demand effects ▸ Slide
- Transient increase in overall birth rates among recipient households (+13%) ▸ Figure
  - Does not appear driven by selection of women with different characteristics (demographic, socioeconomic) into fertility ▸ Predicted Fertility ▸ Balance on Observables ▸ IMR Results with Controls
  - Duration of transfers 8 months $\rightarrow$ fertility effects unlikely for births where cash received in birth month (where IMR effects are largest)
  - Empirically: reduced-form estimate on births 0-9 months post transfer 2.4/1000 (5%, $p = 0.5$)

# Discussion

- A new empirical fact: Analysis of a large new dataset indicates that unconditional cash transfers lead to large **reductions of 40 to 50%** in child mortality in rural Kenya
  - Program is estimated to have averted 90 child deaths in this sample
  - Large effect consistent with non-experimental variation within sample
- Effects concentrated in the period when cash was going out
  - Largest reductions for those receiving cash around the time of birth
  - Transitory: there is a return to the status quo after the cash transfer stops
- Implications for policy, cost-effectiveness of development programs

# References I


Timothy G. Conley. Spatial econometrics. In Steven N. Durlauf and Lawrence E. Blume, editors, The New Palgrave Dictionary of Economics, volume 7, pages 741–747. Palgrave Macmillan, second edition edition.

Buddhika P.K. Mahesh, John D. Hart, Ajay Acharya, Hafizur Rahman Chowdhury, Rohina Joshi, Tim Adair, and Riley H. Hazard. Validation studies of verbal autopsy methods: a systematic review. BMC Public Health, 22:1–8, 12 2022. ISSN 14712458. doi: 10.1186/S12889-022-14628-1/TABLES/1. URL https://link.springer.com/articles/10.1186/s12889-022-14628-1https://link.springer.com/article/10.1186/s12889-022-14628-1.

Alireza Olyaee Manesh, Trevor A. Sheldon, Kate E. Pickett, and Roy Carr-Hill. Accuracy of child morbidity data in demographic and health surveys. International Journal of Epidemiology, 37:194–200, 2 2008. ISSN 0300-5771. doi: 10.1093/IJE/DYM202. URL https://dx.doi.org/10.1093/ije/dym202.

Katharine J. McCarthy, Ann K. Blanc, Charlotte E. Warren, James Kimani, Brian Mdawida, and Charity Ndwidga. Can surveys of women accurately track indicators of maternal and newborn care? a validity and reliability study in kenya. Journal of Global Health, 6, 2016. ISSN 20472986. doi: 10.7189/JOGH.06.020502. URL /pmc/articles/PMC5012235//pmc/articles/PMC5012235/?report=abstracthttps://www.ncbi.nlm.nih.gov/pmc/articles/PMC5012235/.

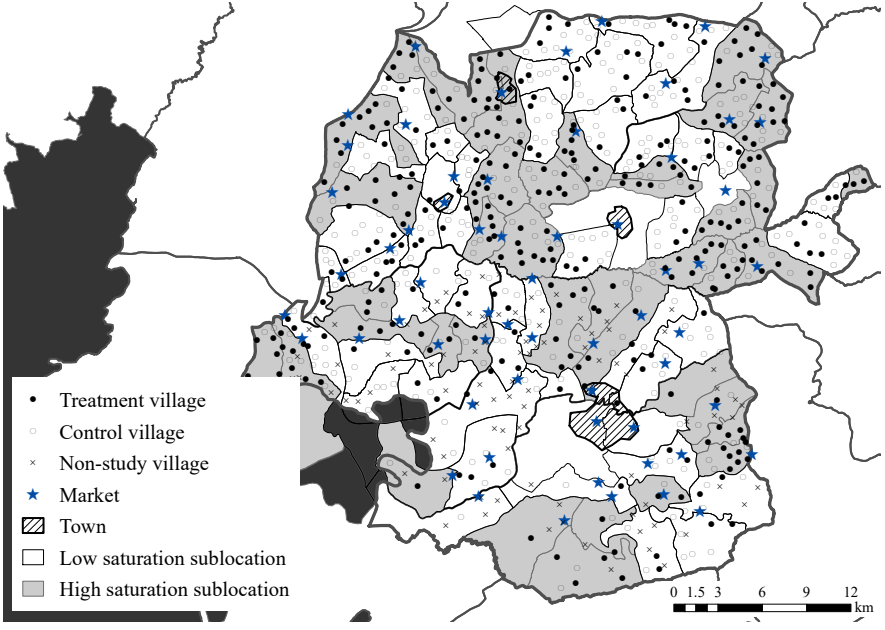
# Appendix

# Setting: rural western Kenya

653 villages in Siaya County

- ~100 households per village
- 4.3 members, 2.2 children on avg
- 98% of HH's in agriculture, 49% in self-employment, and 46% in wage work
- Avg respondent school attainment 5 years
- Steady economic growth, no national elections when cash distributed (late 2014 to early 2017)
- Delivery health services expensive in practice ('birth kits'), $60-100 common

# Spatial exposure to cash transfer treatment (Siaya, Kenya)



# Immediate economic impacts from Egger et al. (2022) Table

- Focuses on surveys conducted on average 1.5 years after the start of transfers
- All data publicly available on the *Econometrica* website – we welcome its use

- Document large impacts on consumption and assets for recipient households, confirming earlier RCT studies of cash transfer impacts
- Also document sizable **spillover benefits for local enterprises (in revenue) and non-recipient households** (in labor earnings and consumption), and perhaps surprisingly, minimal local price inflation (<1%).

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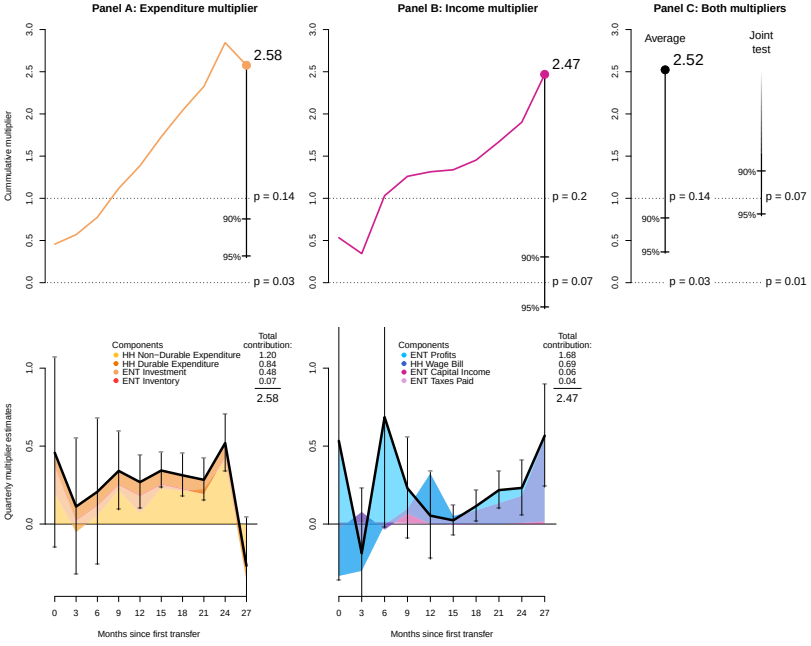
$\Rightarrow$ Main finding: taken together, the design and data allow us to generate an experimental estimate of a macroeconomic quantity, a **(real) local transfer multiplier of +2.5**.

# Real transfer multiplier (Egger et al. 2022)



# Short-term Results: Expenditure and Assets

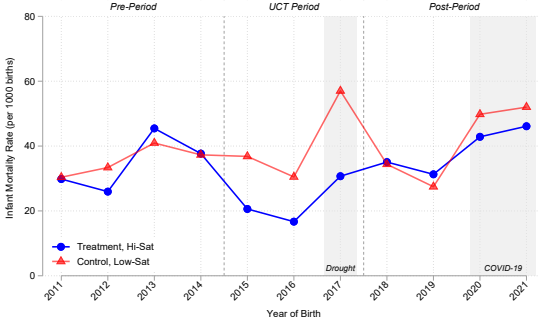
Back

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | **Recipient Households** | | **Non-Recipient Households** | |
| | 1(Treat Village) Reduced form | Total Effect IV | Total Effect IV | Control, low saturation mean (SD) |
| Panel A: Expenditure | | | | |
| Household expenditure, annualized | 293.59*** | 338.57*** | 334.77*** | 2536.01 |
| | (60.11) | (109.38) | (123.20) | (1933.51) |
| Non-durable expenditure, annualized | 187.65*** | 227.20** | 317.62*** | 2470.69 |
| | (58.59) | (99.63) | (119.76) | (1877.23) |
| Food expenditure, annualized | 72.04* | 133.84** | 133.30** | 1578.05 |
| | (36.96) | (63.99) | (58.56) | (1072.00) |
| Durable expenditure, annualized | 95.09*** | 109.01*** | 8.44 | 59.41 |
| | (12.64) | (20.24) | (12.50) | (230.83) |
| Panel B: Assets | | | | |
| Assets (non-land, non-house), net borrowing | 178.78*** | 183.38*** | 133.06* | 1131.66 |
| | (24.66) | (44.26) | (78.33) | (1419.70) |

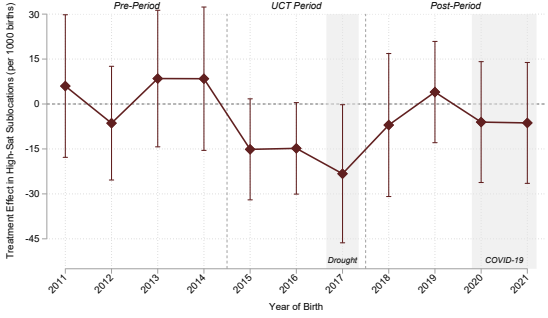
*Notes:* * $p < .10$, ** $p < .05$, *** $p < .01$.

# Results: Cash transfers and infant mortality by year

Back




Panel A: Infant Mortality by Year




Panel B: Reduced-Form Impacts by Year

*Notes:* Panel A reports the mean infant mortality rate by year among eligible households for treatment villages in high-saturation areas and control villages in low-saturation areas. Panel B reports the reduced-form estimates of infant mortality impacts for treatment villages in high-saturation areas. Pre-period births refer to births occurring in the period 2011-14, whereas the unconditional cash transfer (UCT) period refers to 2015-17 and the post-UCT period denotes 2018-21. The COVID-19 pandemic spans 2020-21 and a severe drought affected Kenya in late 2016 and 2017. * $p < .10$, ** $p < .05$, *** $p < .01$. Standard errors clustered at the sublocation level.

# Data: Endline 3 (EL3) Household Census

- From April to November 2023, 64,000 households completed the EL3 census, constituting 92% of all households in the study area (excluding “holiday homes”)
- Over 90% of households surveyed in the 2014 baseline census were successfully tracked in this census, balanced across treatment arms
- **Analysis sample: over 100,000 total births** recorded over the 2011-23 period, with information on child deaths, as well as cause of death (discussed below).
  $\Rightarrow$ Ongoing: detailed household surveys to further capture behavioral mechanisms.
- (Below discuss issues related to: recall; experimenter demand; any fertility effects.)

# Cross-country GDP - infant mortality relationship

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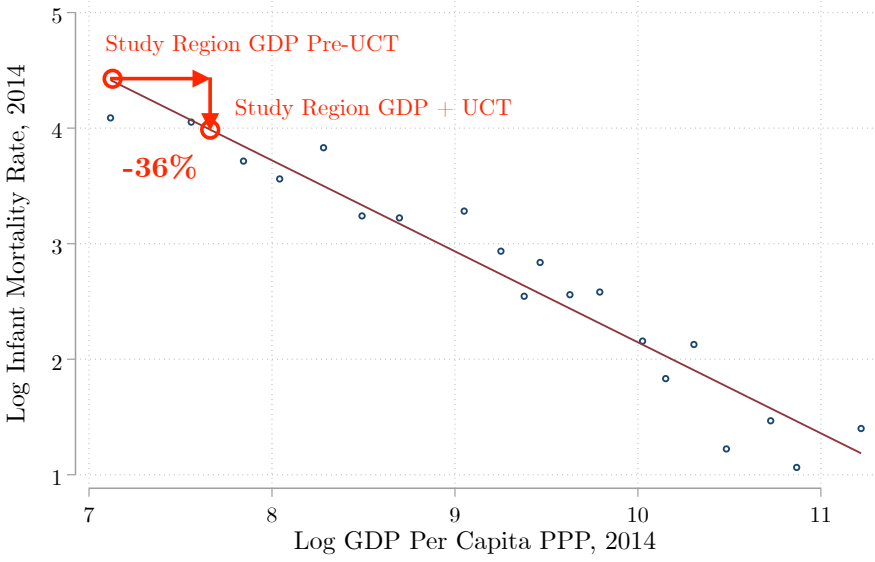

# Cross-sectional comparison, study region

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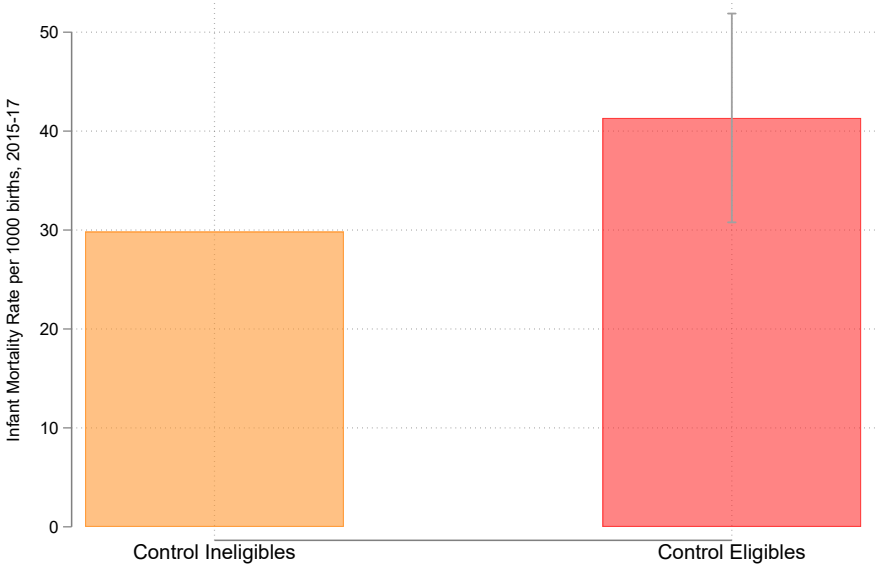

# Infant mortality by month, study region

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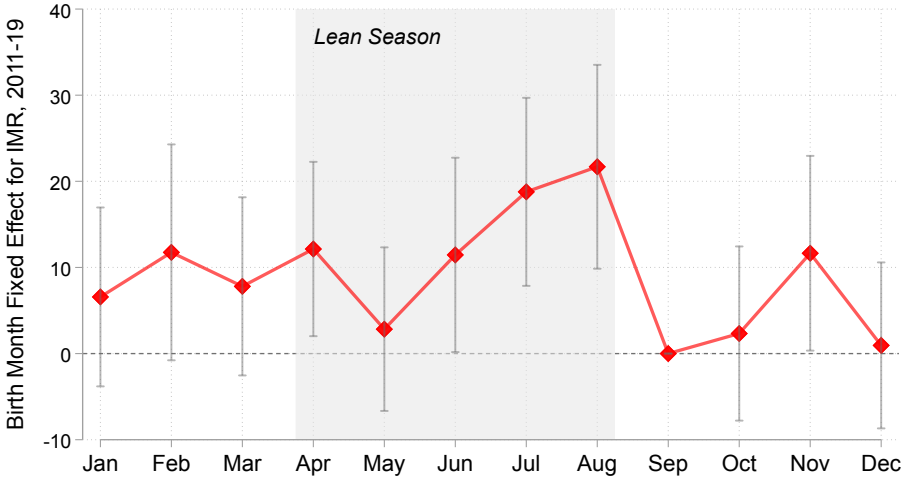

# IMR and aggregate shocks, study region

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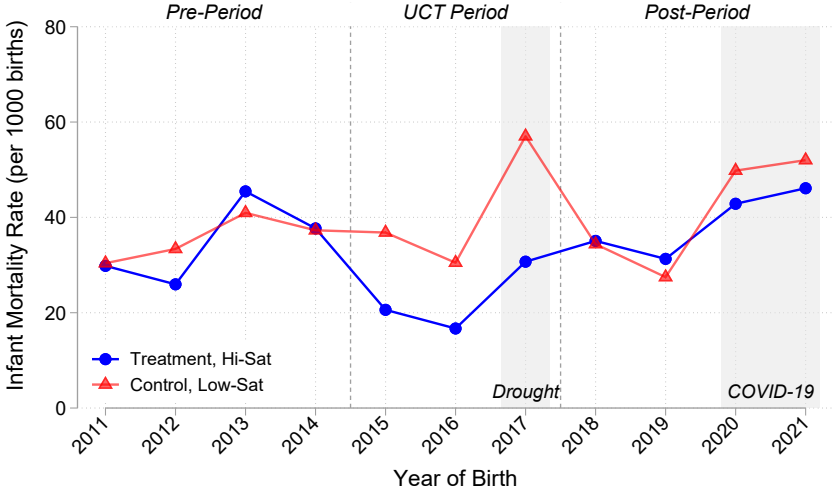

# COVID-19 lockdown and IMR, study region

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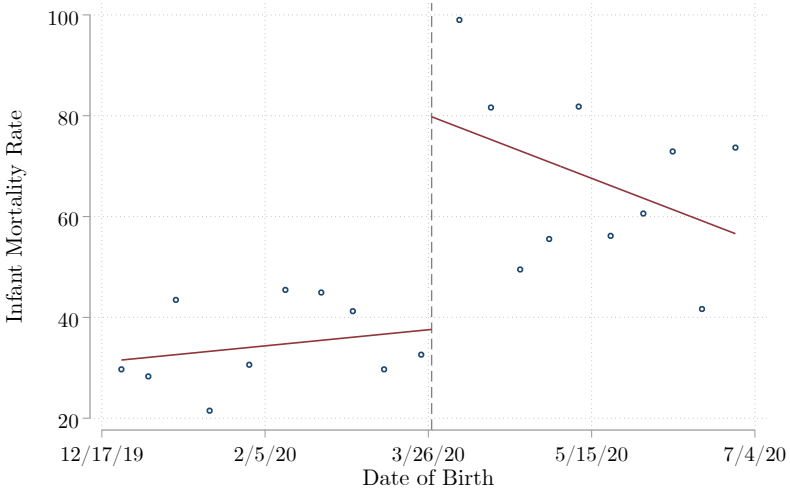

# Non-experimental variation in infant mortality

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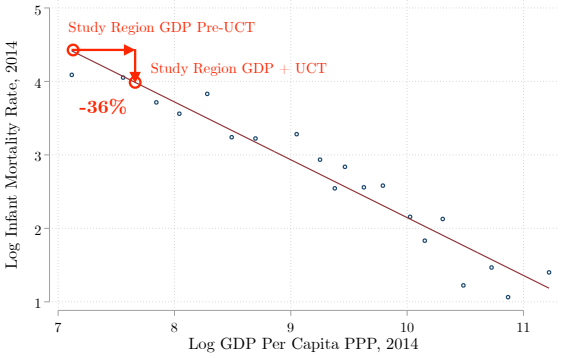
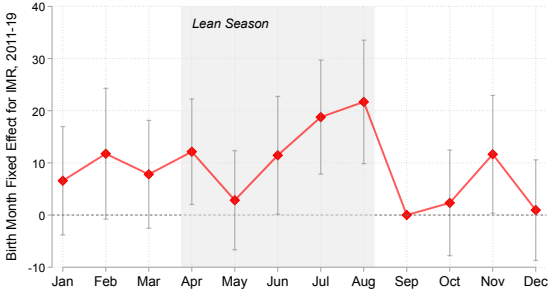



Cross-Country GDP - Infant Mortality Relationship




Infant Mortality by Month, Study Region

# Non-experimental variation in infant mortality

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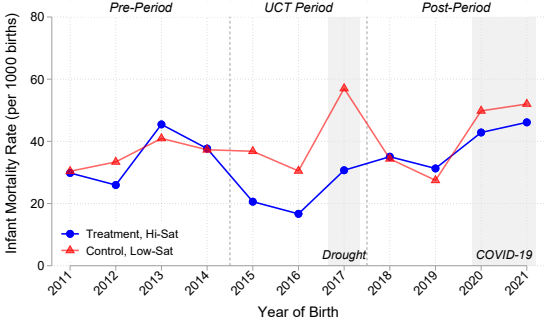
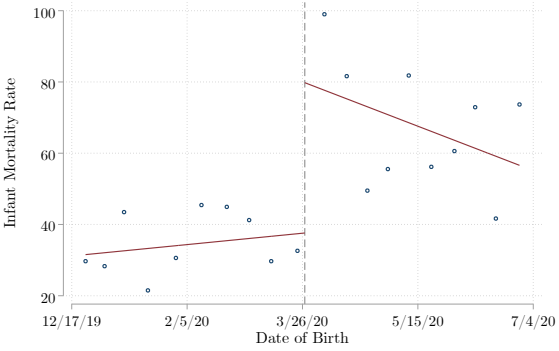



IMR and Aggregate Shocks, Study Region




COVID-19 Lockdown and IMR, Study Region

# Results: Impacts on Primary Outcomes (Excluding Stillbirths)

Back

| | Reduced-form | | Spatial IV | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| | Infant Mortality 2015-17 | Under-5 Mortality 2015-17 | Infant Mortality 2015-17 | Under-5 Mortality 2015-17 |
| Own village | -6.85 | -13.10** | -9.02** | -13.79*** |
| | (5.53) | (6.13) | (4.44) | (5.26) |
| High-saturation spillovers | -9.63** | -3.18 | -8.35 | -9.84 |
| | (4.84) | (6.52) | (5.47) | (7.33) |
| ATE in high-saturation sublocations | -16.48*** | -16.28*** | -17.38*** | -23.63*** |
| | (4.64) | (5.60) | (5.73) | (8.11) |
| Percent reduction in HS sublocations | 52.04% | 33.24% | 54.88% | 48.24% |
| Control Mean | 31.66 | 48.98 | 31.66 | 48.98 |

*Notes:* * $p < .10$, ** $p < .05$, *** $p < .01$. Reduced form standard errors are clustered at the sublocation level. Spatial HAC standard errors (Conley, 2008) with a cutoff of 10km are reported for IV estimates.

# Results: Impacts including secondary outcomes

Back

| | Primary outcomes | | Secondary outcomes | |
|---|---|---|---|---|
| | (1) Infant Mortality 2015-17 | (2) Under-5 Mortality 2015-17 | (3) Neonatal Mortality 2015-17 | (4) Days survived under-5 2015-17 |
| **Panel A: Reduced-form results** | | | | |
| Treatment village | -5.74 | -11.96* | -3.56 | 17.63* |
| | (5.85) | (6.38) | (4.00) | (10.22) |
| MHT adjusted p-value | [0.234] | [0.110] | | |
| High-saturation sublocation | -12.13** | -5.68 | -6.00 | 11.78 |
| | (5.04) | (6.66) | (3.75) | (10.50) |
| Treatment village in high-saturation sublocation | -17.87*** | -17.64*** | -9.56** | 29.41*** |
| | (4.94) | (5.86) | (3.80) | (9.75) |
| **Panel B: Spatial IV results** | | | | |
| Spatial IV: Own village effect | -7.98* | -12.72** | -3.56 | 17.83* |
| | (4.82) | (5.55) | (3.62) | (9.55) |
| Spillover effect | -11.49* | -12.91 | -11.00* | 26.94** |
| | (6.84) | (8.12) | (6.16) | (13.12) |
| ATE on eligibles | -19.46*** | -25.63*** | -14.57** | 44.78*** |
| | (6.94) | (8.54) | (5.75) | (13.47) |
| MHT adjusted p-value | [0.044] | [0.036] | | |
| Control Mean | 40.21 | 57.37 | 23.05 | 1,735.17 |
| Observations | 6,317 | 6,318 | 6,237 | 6,257 |

*Notes:* Reduced form standard errors are clustered at the sublocation level. Spatial HAC standard errors (Conley, 2008) with a cutoff of 10km are reported for IV estimates. MHT corrected p-values in brackets.

# Results: Impacts including treatment-high saturation interaction

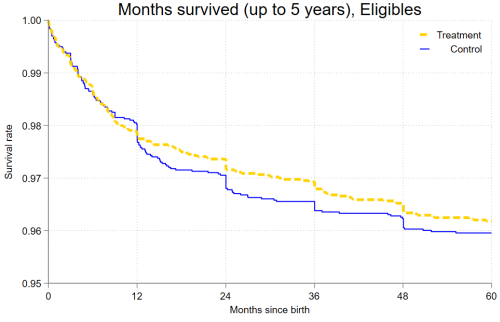
Back

| | (1) Infant Mortality 2015-17 | (2) Under-5 Mortality 2015-17 | (3) Neonatal Mortality 2015-17 | (4) Days Survived U5 2015-21 |
|---|---|---|---|---|
| Treatment Village | 4.674 | -3.958 | -0.406 | 6.791 |
| | (7.807) | (8.414) | (5.590) | (13.136) |
| High-Saturation Sublocation | 0.207 | 3.794 | -2.318 | -0.878 |
| | (7.867) | (10.239) | (5.514) | (16.205) |
| Treatment x High-Saturation | -22.404** | -16.812 | -6.727 | 22.869 |
| | (11.073) | (12.361) | (7.897) | (20.047) |
| Treatment Villages in High-Saturation Sublocations | -17.52*** | -16.98*** | -9.45** | 28.78*** |
| | (4.93) | (5.97) | (3.82) | (9.86) |
| Control Mean | 40.210 | 57.372 | 23.053 | 1735.166 |
| Observations | 6320 | 6321 | 6240 | 6260 |

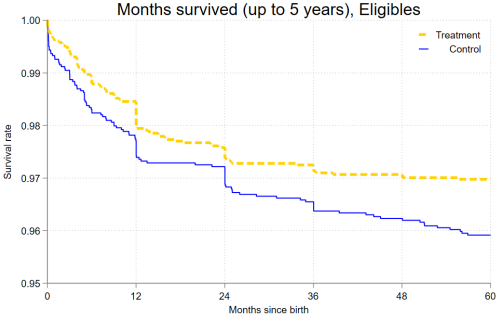
*Notes:* * $p < .10$, ** $p < .05$, *** $p < .01$. Standard errors clustered at sublocation level.

# Survival plots

Back



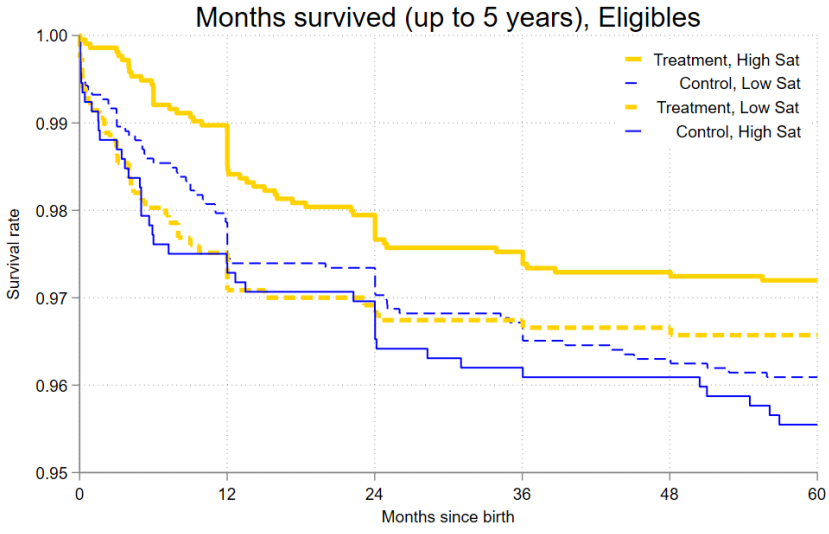

Pre-cash transfer




UCT Period

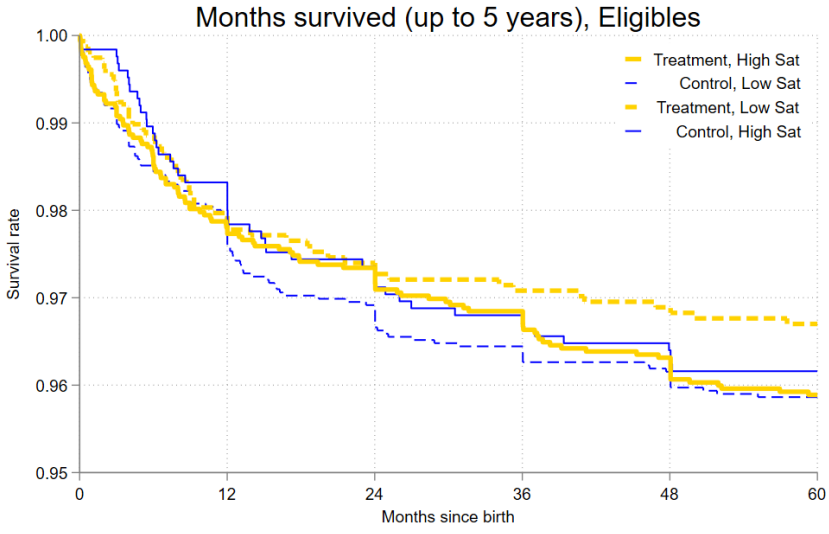
# Survival plot, 2015-2017

Back



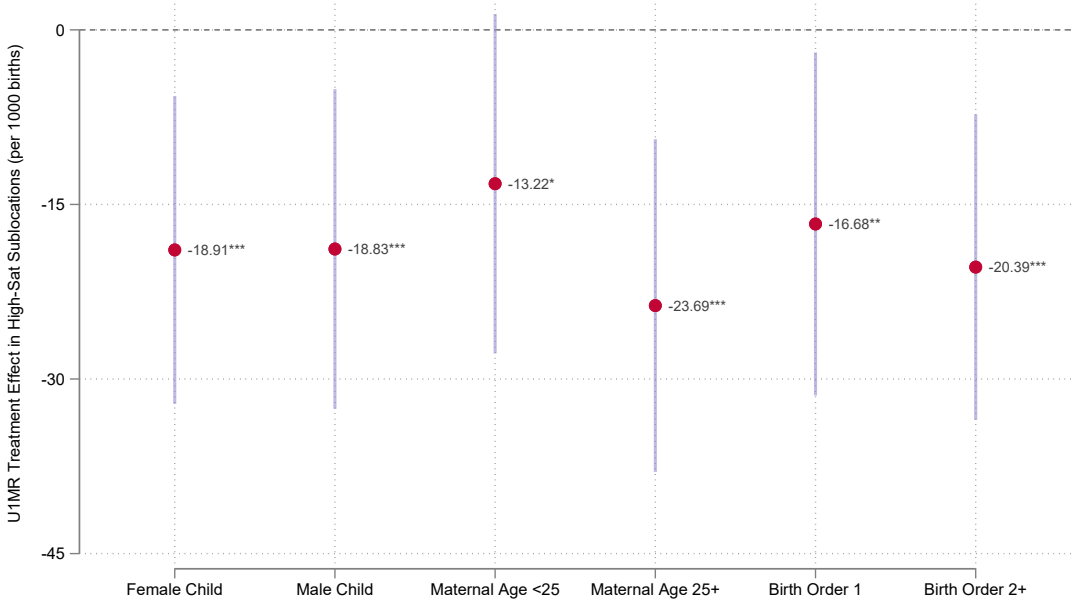
# Survival plot, pre 2015

Back



# Heterogeneity: Gender, Maternal Age, Birth Order

Table Interpretation Cash Enough




Notes: * p < .10, ** p < .05, *** p < .01. 95% confidence intervals are displayed.

# Results: Heterogeneity by Gender, Maternal Age, and Birth Order

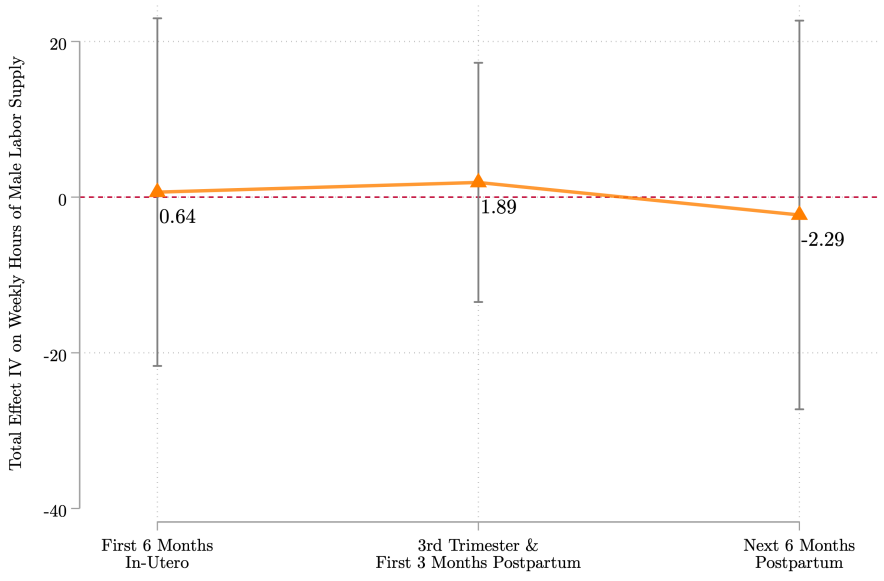
Back

| | (1) Male | (2) Maternal Age 25+ | (3) Birth Order 2+ |
|---|---|---|---|
| Treatment Village | -12.80* | -6.75 | -15.41* |
| | (7.63) | (7.33) | (8.08) |
| High-Saturation Sublocation | -6.12 | -6.60 | -1.28 |
| | (7.46) | (7.16) | (7.95) |
| Treatment Village x Heterogeneity | 8.53 | -3.52 | 11.80 |
| | (10.50) | (10.80) | (10.47) |
| High Saturation Sublocation x Heterogeneity | -8.44 | -6.76 | -15.53 |
| | (10.36) | (10.65) | (10.29) |
| Treatment Villages in High-Saturation Sublocations | -18.93** | -13.35* | -16.69* |
| | (7.81) | (8.08) | (8.62) |
| Treatment in Hi-Sat Subloc Including Heterogeneity Char | -18.83** | -23.64*** | -20.42*** |
| | (8.21) | (7.84) | (7.25) |
| F-Test Two-Sided P-Value | 0.99 | 0.37 | 0.74 |
| Control Mean | 39.82 | 39.82 | 39.82 |
| Observations | 6260 | 6298 | 6260 |

*Notes:* * $p < .10$, ** $p < .05$, *** $p < .01$. Standard errors clustered at village level. All equations include indicators for given dimension of heterogeneity. Outcome is infant mortality.

# Impact on Male Labor Supply for Surveys Around Birth

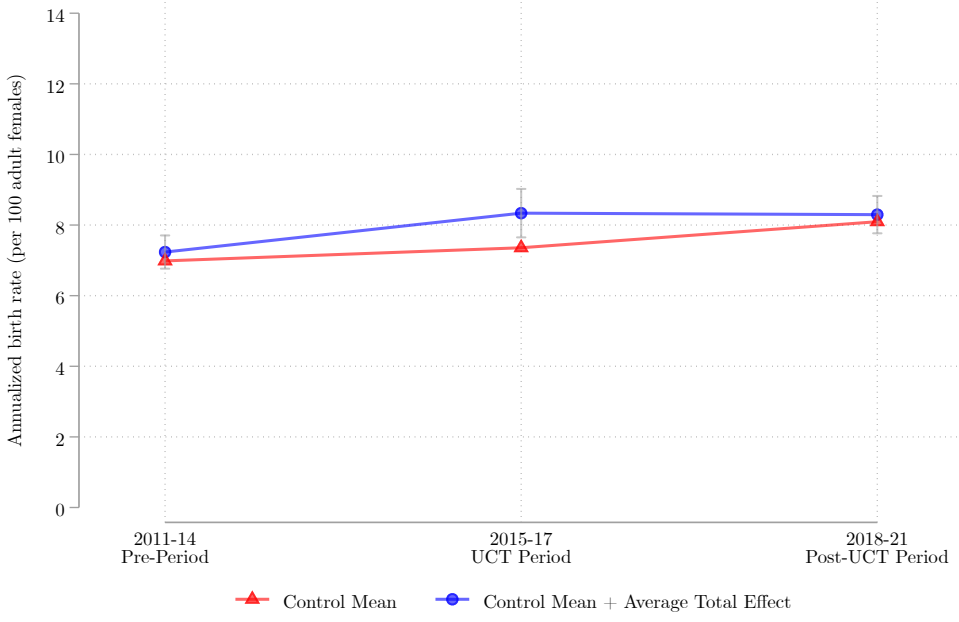
Back




*Notes:* Control means are 32.51 (1st 6m in-utero), 27.04 (3rd trimester/1st 3m postpartum), 37.52 (next 6m postpartum), 27.56 (other men).

# Cash Transfers and Birth Rates in Recipient Households

Back



# Impacts on Recipient Baseline Household Fertility

LASSO Back

| | Actual Fertility Among Adult Women | | | Predicted Fertility Among Actual Mothers | |
|---|---|---|---|---|---|
| | (1) 2011-14 | (2) 2015-17 | (3) 2018-21 | (4) 2015-17 | (5) 2018-21 |
| Total Effect IV | 0.25 | 0.98*** | 0.20 | -0.18 | -0.64 |
| | (0.24) | (0.35) | (0.27) | (0.61) | (0.61) |
| Control Mean | 6.99 | 7.36 | 8.10 | 8.00 | 10.01 |
| Observations | 23527 | 23527 | 23527 | 930 | 930 |

*Notes:* Data comprise women from the EL3 census (columns 1-3) and women from the EL3 census from households surveyed at baseline (columns 4-5). Fertility outcomes represent the annual probability a woman gives birth to at least one child. The last two columns report predicted fertility among women actually giving birth in a given period using a random forest trained on women in control, low-saturation villages with household baseline income, assets, education, marital status, age, and household size as predictor variables. * $p < .10$, ** $p < .05$, *** $p < .01$. Standard errors clustered at sublocation level.

# UCTs and Observables of Households Giving Birth in 2015-17

Back

| | (1) Education | (2) HH Head Age | (3) Marital Status | (4) Income | (5) Assets | (6) HH Size |
|---|---|---|---|---|---|---|
| Total Effect IV | -0.08 | -1.60 | 0.07 | -4056.17 | -5412.13 | 0.32 |
| | (0.30) | (1.27) | (0.04) | (2772.12) | (4949.98) | (0.23) |
| Control Mean | 8.588 | 34.499 | 0.718 | 14895.334 | 32446.214 | 4.403 |
| Observations | 1159 | 1158 | 1159 | 1159 | 1159 | 1159 |

*Notes:* This table reports regressions exhibiting the association between treatment status and six baseline household socioeconomic characteristics (maximum years of education of household members, primary respondent age, number of adults, number of children, baseline household assets, and baseline household income) for transfer-eligible households present at baseline with births over 2015-17 that were sampled in the baseline survey. * $p < .10$, ** $p < .05$, *** $p < .01$. Standard errors clustered at the village level.

# UCTs and Predicted Birth Probability Among Actual Mothers

Back

| | (1) Probability of Birth Among Actual Mothers Socioeconomic Variables | (2) Probability of Birth Among Actual Mothers LASSO Variables |
|---|---|---|
| Total Effect IV | -0.18 | 0.27 |
| | (0.61) | (0.21) |
| Control Mean | 8.009 | 7.921 |
| Observations | 929 | 929 |

*Notes:* This table reports regressions exhibiting the association between treatment status and the probability of birth among mothers who actually gave birth over 2015-17. The sample is comprised of mothers in transfer-eligible households present at baseline sampled in the baseline survey. In column 1, the probability of birth is predicted using six baseline household socioeconomic characteristics (maximum years of education of household members, primary respondent age, marital status of primary respondent, income, assets, and household size) using a random forest trained on women in control, low-saturation villages. In column 2, the probability of birth is predicted linearly using variables selected by LASSO. In both cases, the training sample is not included in the final regression. * $p < .10$, ** $p < .05$, *** $p < .01$. Spatial HAC standard errors with 10km cutoff reported for IV estimates.

# Effects on IMR After Including Controls

Back

| | (1) No Controls BL Survey Sample | (2) Socioeconomic Controls | (3) PDS LASSO-Selected Controls |
|---|---|---|---|
| Total Effect IV | -42.44*** | -34.89** | -43.55*** |
| | (16.13) | (16.12) | (15.72) |
| Control Mean | 60.810 | 60.810 | 60.810 |
| Observations | 1432 | 1432 | 1432 |

*Notes:* This table reports effects estimated by Equation 2 of the cash transfer on infant mortality rates for transfer-eligible households present at baseline and surveyed in the baseline survey. Mortality data are sourced from the endline 3 census whereas household- and village-level control variables are sourced from the baseline survey. Column 1 presents infant mortality results in the baseline survey sample with no additional controls beyond those pre-specified (e.g., year of birth fixed effects, birth gender, mother age group). Column 2 includes controls for six baseline household socioeconomic characteristics (maximum years of education of household members, primary respondent age, marital status of primary respondent, income, assets, and household size) along with a full set of interactions between these variables. Column 3 includes controls selected by PDS LASSO, with a total of 261 baseline variables available for selection. * $p < .10$, ** $p < .05$, *** $p < .01$. Spatial HAC standard errors (Conley) with a cutoff of 10km are reported for IV estimates.

# Endline 2 Household Consumption and Asset Results

Back

| | Recipient households | | | Non-recipient households | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | (1) 1(Treat village) Eligibles | (2) Total Effect IV | (3) N (eligible) | (4) 1(Treat village) Ineligibles | (5) Total Effect IV | (6) IV Control Eligibles | (7) IV Ineligibles | (8) Control, low-saturation mean (SD) | (9) N (non-recip) |
| Total consumption expenditure in last 12 months (wins) (PPP) | 228.53*** | 226.85*** | 4191 | -17.21 | 184.40* | -40.93 | 238.65** | 2130.16 | 4274 |
| | (54.49) | (75.13) | | (92.39) | (98.48) | (72.65) | (115.91) | (1616.89) | |
| Food consumption expenditure (annualized from last 7 days) (wins) (PPP) | 53.05 | 65.65 | 4191 | 15.59 | 73.96 | -5.61 | 93.12 | 1315.21 | 4274 |
| | (32.96) | (47.21) | | (48.64) | (54.98) | (42.68) | (63.10) | (895.17) | |
| Total non-land, non-house assets, net lending (wins) (PPP) | 154.82*** | 134.45*** | 4191 | 52.52 | 51.29 | -83.41 | 83.71 | 965.57 | 4276 |
| | (26.51) | (48.81) | | (72.14) | (84.15) | (52.02) | (103.67) | (1188.43) | |

*Notes:* * $p < .10$, ** $p < .05$, *** $p < .01$. Conley (2008) standard errors with a positive definite kernel up to 10 km are in parentheses.

# Exploring Mechanisms

- We explore the mechanisms through which cash transfers affect child mortality by looking at UCT exposure at different **stages of the life-cycle** and by examining **changes in cause of death**
- UCT exposure by age:
  - Receiving cash near time of birth has the largest impact
  - No evidence of sustained effects (consistent with lack of spillovers)
- Cause of death:
  - Large reductions in maternal and neonatal causes
  - Smaller (and not individually significant) reductions in most other causes of death
  - Post-neonatal reductions potentially underestimated, due to larger number of surviving infants (competing risks)

# Estimating the Effects of Transfers at Different Stages in the Life-Cycle

- We aim to understand how receiving cash at different pregnancy stages affects child mortality (e.g. in-utero versus when the child is one)
- We also want to test for the persistence of effects
- Leverage random variation in intervention start dates to estimate dynamic effects using IV regression
- To avoid concerns in the dynamic difference-in-difference literature, estimate regressions separately for individuals exposed at different stages in their life indexed by $g$ where

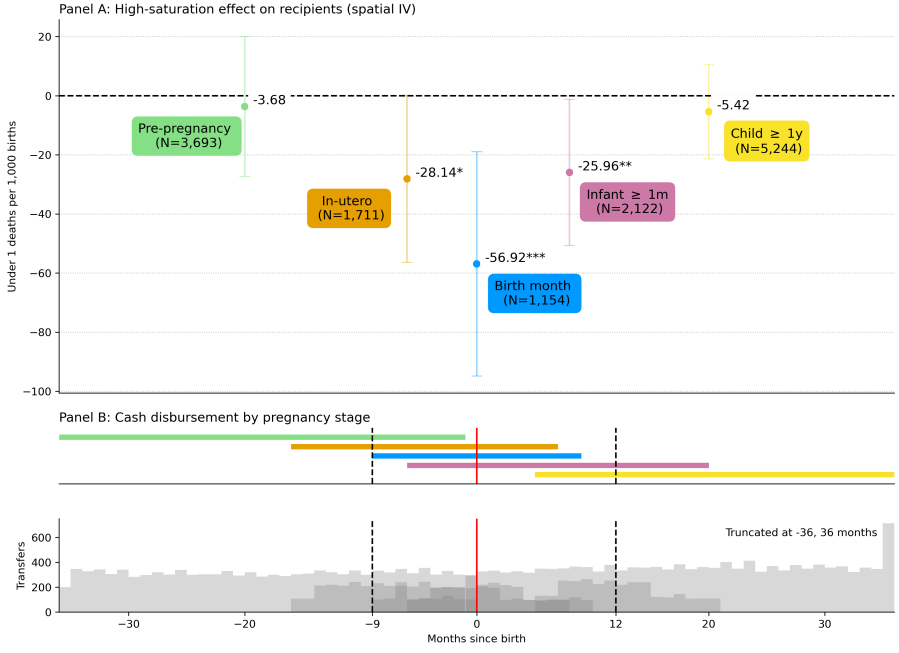
$g \in$ {3-5y post birth, 9m-3y post birth, in-utero, neonatal, infant, 1-3 years pre birth, 3-5 years pre-birth}

$$y_{imhvs} = \beta_g Amt_{vg} + \sum_{r=2}^{\bar{R}} \gamma_{vg,r} Amt_{vg,r}^{\neg v} + \lambda_v ShareElig_{vg} + \sum_{r=2}^{\bar{R}} \lambda_{vg,r} ShareElig_{vg,r}^{\neg v} + \lambda_{t(i)} + \epsilon_{imhvs}$$

- Limitation: transfers occurred over 10 months, so many infants exposed to cash in-utero were also exposed as a neonate, etc. Back

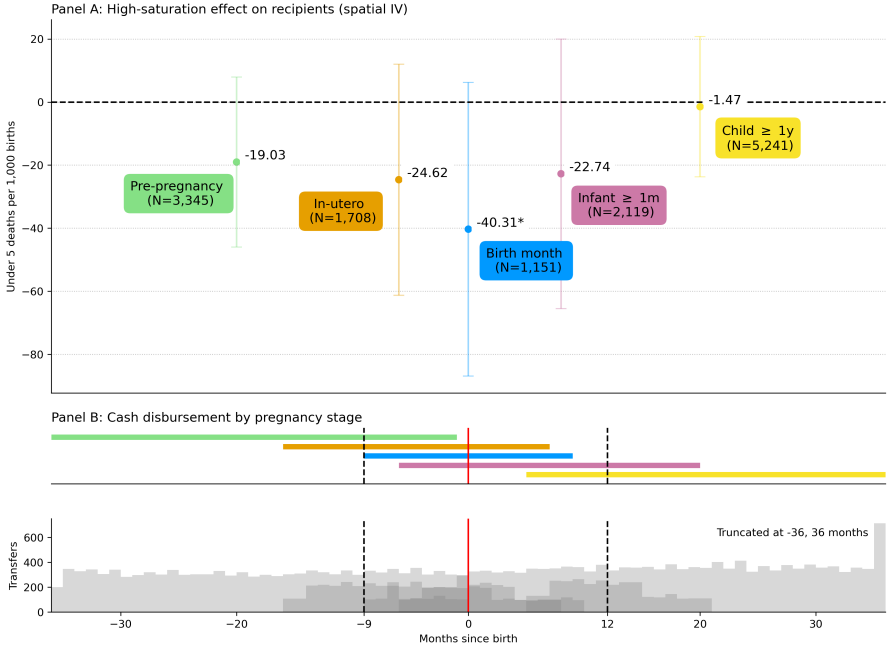
# Large Effects of Cash in Utero or Under-1

U5 figure Back



# Large Effects of Cash In Utero or Under-1

Back



# Results do not appear to be consistent with demand effects

Back

- No persistent effects
  - Only reduction in the exact UCT years of 2015-2017, but might expect sustained effects if social desirability biased responses
- Detect spillover effects on IMR, but spillover exposure is not obvious to respondents
- Effects concentrated among households that received cash at exactly the time of birth (when there is a plausible mechanism, hospital delivery, backed up by survey evidence)
- VA analysis shows effects concentrated in maternal/neonatal causes, no change in non-communicable diseases (e.g., cancer) where cash is less likely to have impact

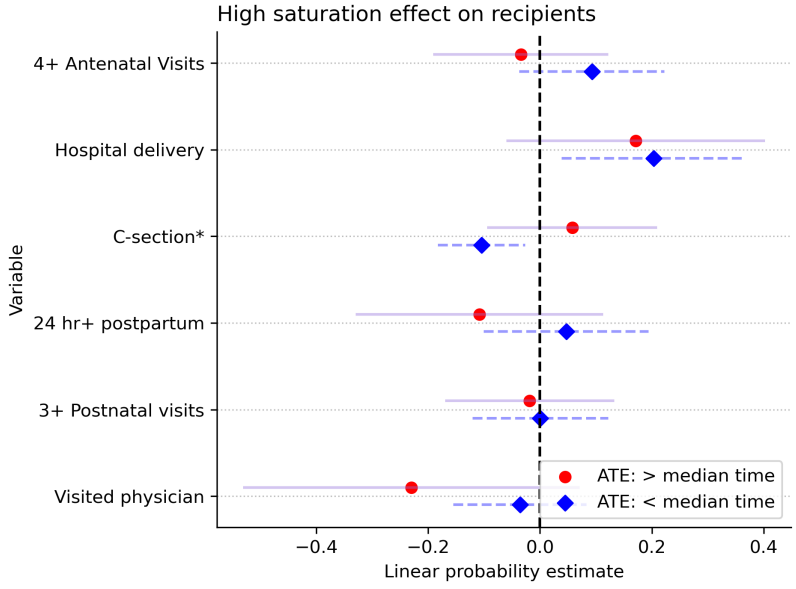
# Recall errors seem unlikely to bias headline mortality estimates

Back

- Public health evidence indicates that recall is very accurate for recording both births and child deaths, consistent with them being important and and memorable events (Manesh et al., 2008; Mahesh et al., 2022; McCarthy et al., 2016)
  - Consistent with our team's field experiences and anecdotes
  - Recall data on mechanisms (i.e., exact amount spent on an antenatal visit years ago) may be less reliable (McCarthy et al., 2016)
- Similar recall methods are standard in Demographic and Health Surveys (DHS), the most common data source in related research
- Simple recall failures of the year of birth would likely attenuate estimates

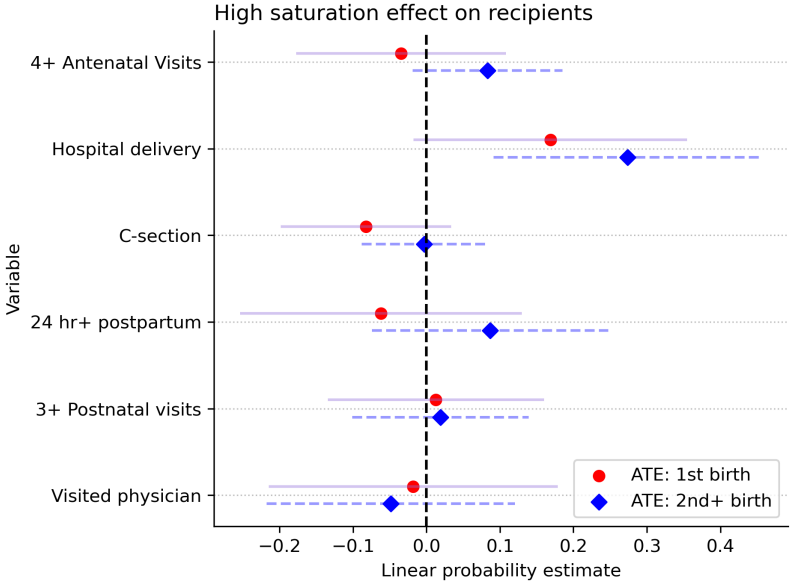
# Survey results by proximity to a physician-staffed facility

Back



# Survey results by birth order

Back



# GiveWell's top ranked charity

Back

An SMC Community Distributor in Burkina Faso shows an infant a strip for measuring malnutrition, which may be done alongside delivery of the antimalarial medicine. Photo credit: Malaria Consortium/Sophie Garcia

CHARITY 1 OF 4

## Medicine to prevent malaria

### OVERVIEW

Malaria **kills around 600,000 people annually**, mostly children under 5 in sub-Saharan Africa.[2] Seasonal malaria chemoprevention is preventive medicine that saves children's lives. It is given during the four months of the year when malaria infection rates are especially high.

### COST-EFFECTIVENESS

About **$7** to protect a child from malaria.[3] In 2021-2023, we directed funding to the Malaria Consortium to support this program at an estimated average cost-effectiveness of **$4,500** per life saved.[4]

Compare to most charities' programs

### EVIDENCE OF IMPACT

**Exceptionally strong**. Many high-quality studies of seasonal malaria chemoprevention have consistently found strong impact. Malaria Consortium conducts valuable, high-quality ongoing monitoring.

Compare to most charities' programs

### TOP ORGANIZATION IN THIS AREA

**Malaria Consortium**

SEASONAL MALARIA CHEMOPREVENTION PROGRAM

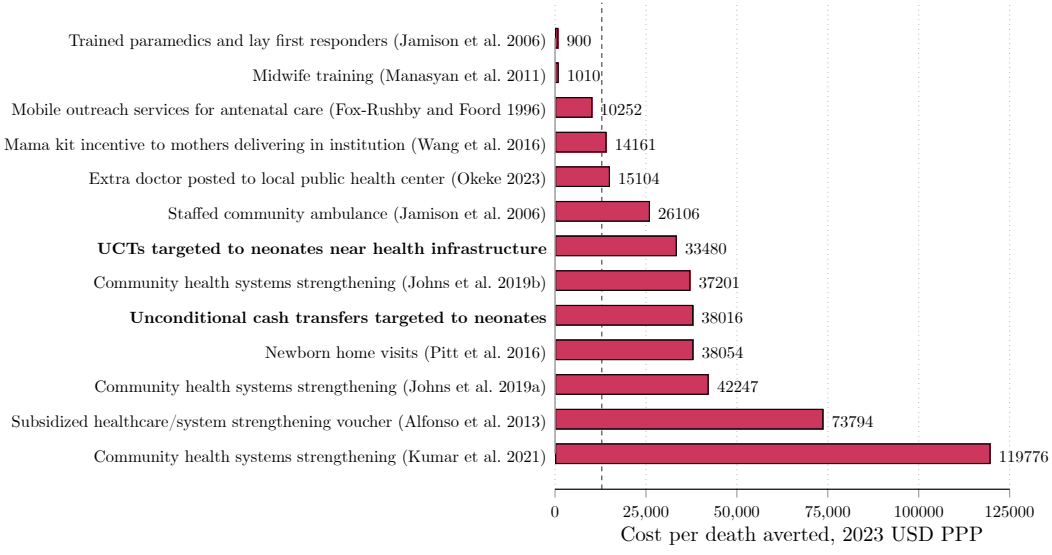
FULL RESEARCH REPORT | DONATE

# Details: Valuing lives saved

- GiveWell employs *moral weights* in cost-effectiveness calculations to balance the trade-offs between consumption and other goods (source “Approaches to Moral Weights: How GiveWell Compares to Other Actors”)
- GW’s moral weights value averting a death of someone aged under 5 at 116 times doubling consumption for one year (source “Build your own moral weights!”)
- Per capita annual consumption in sample: USD PPP 758
- Therefore the implied value of averting a death by the “moral weights” is $116 \times \$758 = \$87,935$
- The total value of the estimated averted deaths is $8.0 million

Back

# Cost Per Death Averted for Health Interventions in Sub-Saharan Africa




Valuation Discussion

# Comparison with non-experimental variation

Benchmarking these experimental estimates – drops of 40 to 50% in infant and child mortality – against several sources of non-experimental variation in economic circumstances, **child mortality appears highly sensitive to economic conditions in low-income settings.**

1. Cross-country association between income and health ▸ Figure
2. Cross-sectional variation ▸ Figure
3. Intertemporal seasonal variation ▸ Figure
4. Aggregate economic shocks (drought and COVID-19) ▸ Figure
5. COVID-19 lockdown using exact date of birth ▸ Figure
6. Existing observational work: transfers in low-income settings associated with 14-30% IMR declines (Lim et al. 2010, Barham 2011, Ramos et al. 2021, Richterman et al. 2023).

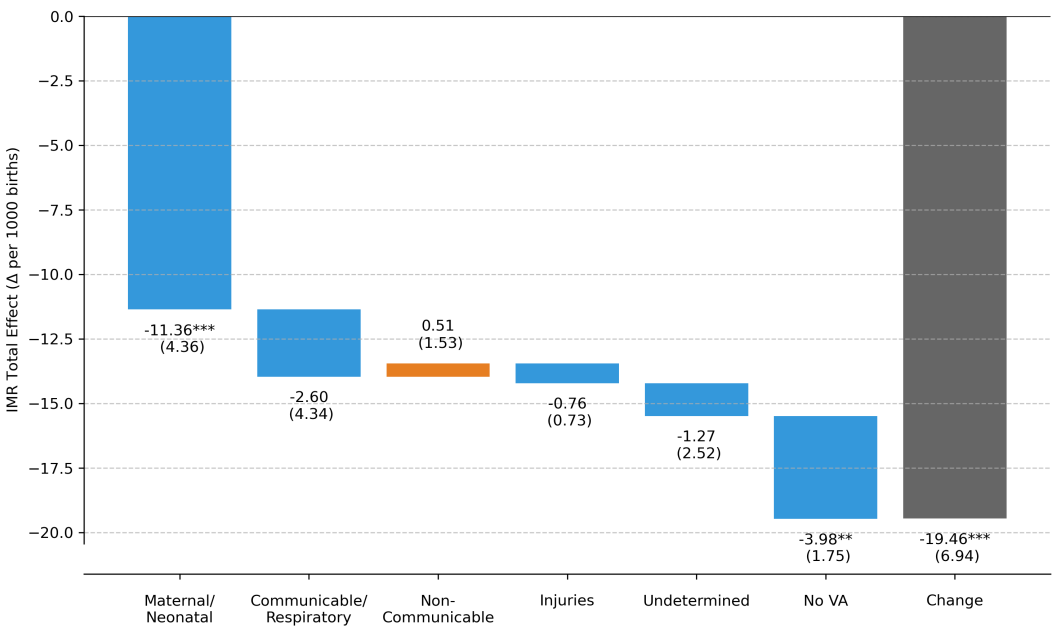
# Evidence from Verbal Autopsies (VA)

- Identify likely cause of death using verbal autopsies (WHO 2022, IHME 2024)
- The **machine learning (ML) algorithm** predicted a likely cause of death (COD) in over 80% of cases, with the remainder undetermined (due to missing / inconsistent answers)
  - The version we use (with priors by COD) was calibrated by the Kenya Medical Research Institute (KEMRI) in the study area, and surveyors were trained by KEMRI experts
  - Public health literature shows that the WHO VA algorithm is reliable (Mahesh 2022)
- Among the 4,696 recorded under-5 deaths, VA was collected in 92% of cases.
  - 82% were collected among an ideal respondent (i.e. present at time of death)

# Main Verbal Autopsy Patterns

- Focus on groups of causes of death (as pre-specified).
- In control villages, **the leading COD is maternal/neonatal causes** (38% of those with non-missing causes), i.e., birth complications, stillbirths, congenital defects
- Communicable/nutritional causes (37% of non-missing causes), i.e., malaria, malnutrition
- Respiratory problems (13%), i.e., pneumonia, upper respiratory infections
  - Other less common COD include non-communicable disease (10%), injuries (2%).

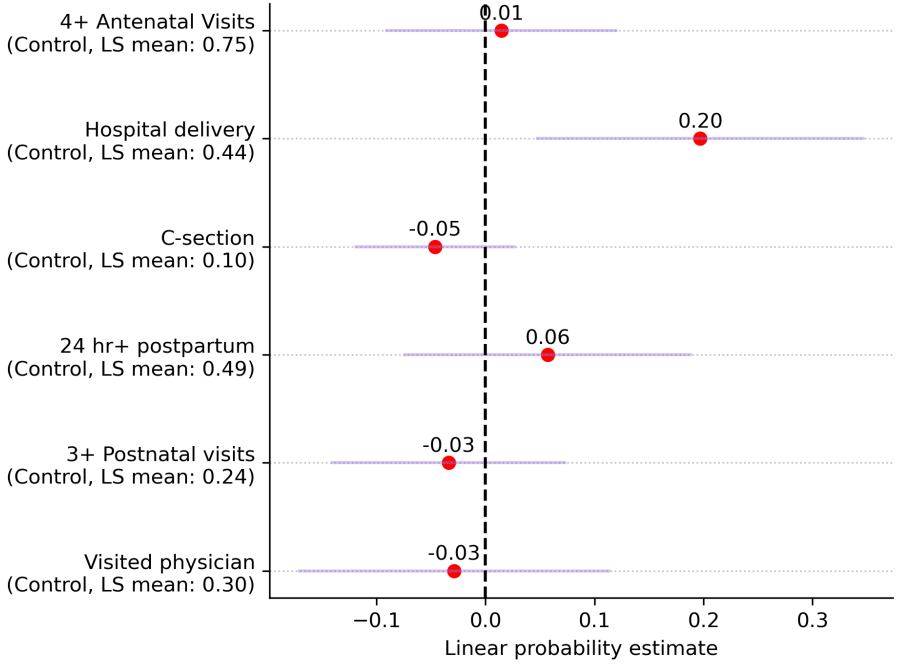
# Results: Sharp drop in birth complications, neonatal deaths




*Notes:* Control means are 15.80 (maternal/neonatal), 10.70 (communicable/resp.), 2.55 (non-commun.), 0.51 (injuries), 7.65 (undetermined), 4.59 (no VA).

# Survey results on healthcare utilization

Distance heterogeneity | Birth order heterogeneity



# Is cash enough? Complementarity with health services

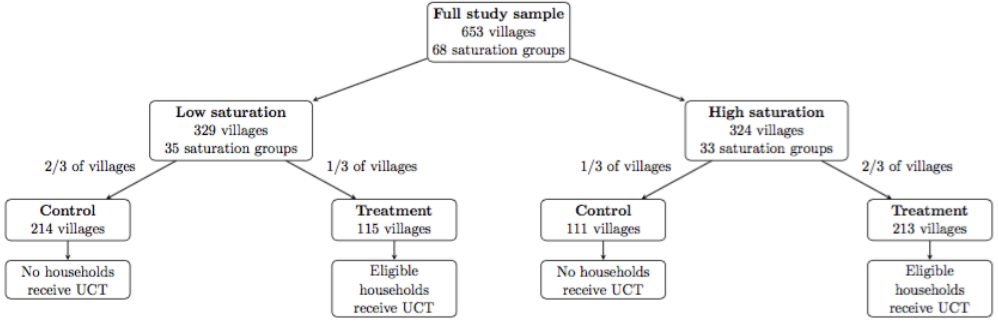
- VA and cash transfer timing results (as well as suggestive evidence that effects are larger among older mothers at higher risk of complications Figure ) indicate a **possible role for antenatal, delivery, postnatal and maternal care**
- Use data on health facilities from the Kenya Master Health Facilities list, which contains the coordinates and contact information of every registered facility nationwide
- Surveyed facilities to understand whether they were staffed by a physician, which has been shown to matter for child health outcomes — see Okeke (2023) in Nigeria.
- Measured travel time by equipping enumerators with GPS speedometers to directly measure speeds on local roads and paths, as well as using OpenStreetMap estimates

# Complementarity with health services: suggestive evidence

| | (1) Study measurements | (2) OpenStreetMaps |
|---|---|---|
| **Panel A: Spatial IV, no controls** | | |
| Total Effect IV (Time: Below median) | -24.24** | -15.79 |
| | (12.31) | (12.03) |
| Total Effect x Above median | 4.42 | -3.33 |
| | (14.15) | (16.08) |
| **Panel B: Spatial IV, double-partial out LASSO controls, with treatment interactions** | | |
| Above median: DP LASSO x Treat Controls | 30.87** | 8.07 |
| | (14.71) | (15.93) |

*Notes:* All travel times are drive time. Column (1) uses GPS-measured travel speeds obtained from enumerators. Column (2) uses OpenStreetMap travel time estimates. Physician-staffed facilities were measured via clinic surveys in 2024. Facilities are included if reported as open in 2014 and employed physician. Possible covariates include malaria suitability, rainfall, baseline village income and assets, road proximity, population, distance to town, and proximity to water source. Covariate

# Study design and timeline: Randomization




Back

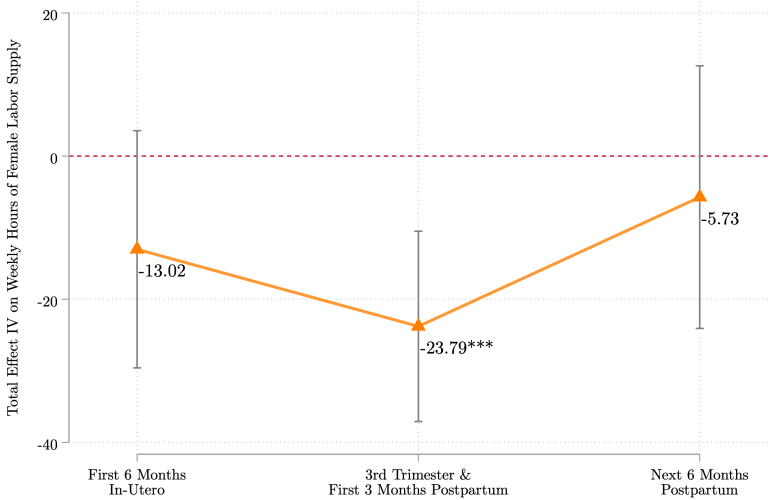
# Other plausible mechanisms: nutrition

- **Nutrition** (mother, child): household food expenditures up 9%, index of child food security up 0.17 SD units (Egger et al. 2022)

| **Outcome** | **Reduced Form** | **Total Effect IV** | **Control, Low-Sat Mean** |
|---|---|---|---|
| Food expenditure | 72.04* (36.96) | 133.84** (63.99) | 1578.05 (1072.00) |
| Child food security index | 0.13*** (0.04) | 0.17** (0.08) | -0.04 (1.12) |

# Other plausible mechanisms: female labor supply

- **Female labor supply**: Women in treated households surveyed in the 3rd trimester of pregnancy or in the first 3 months of birth exhibit substantial reductions in weekly hours worked (by 40 to 90+%) Male Labor Supply




*Notes:* Control means are 26.97 (1st 6m in-utero), 33.26 (3rd trimester/1st 3m postpartum), 21.72 (next 6m postpartum), 25.35 (other women).

# How Many Deaths Did the Cash Transfers Prevent?

Back-of-the-envelope calculations:

- Under-5 deaths averted = Point estimate on under-5 mortality treatment effect $\times$
  # Recipient births censused in treatment villages (born during 2015-17)
  = (-25.32 deaths/1000 births) $\times$ (3,337 births in treatment villages) $\approx$ 86 deaths

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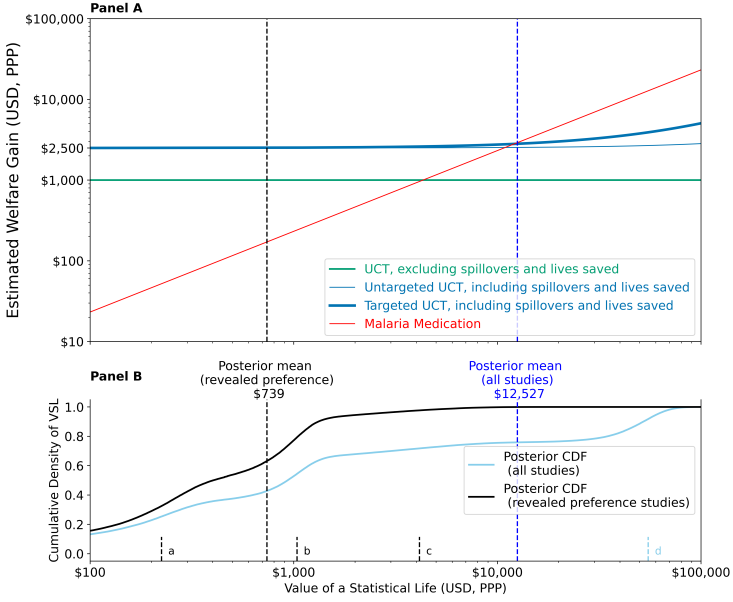
- How do the welfare gains of UCTs compare to leading health programs?
- The typical approach to value lives saved by recipients' **value of a statistical life (VSL)**
  - Revealed-preference estimates typically low (below $5,000) among populations with similar income but some stated preference estimates that inform policy are much higher (>$80,000)
- We plot the welfare gains of UCTs — with and without reductions in mortality — versus an effective health program (malaria medication) to accommodate the range of VSLs

▸ Details and alternative assumptions ▸ Cost-effectiveness comparison

# Welfare Gains from UCTs or Malaria Medicine by VSL

Malaria Medication Details




VSL Estimates a: Killeen (2025), b: Kremer et al. (2011), c: Berry et al. (2020), d: Redfern et al. (2019)

# Spillover effects on non-recipients

Back

| | (1) Infant Mortality 2015-17 | (2) Under-5 Mortality 2015-17 | (3) Neonatal Mortality 2015-17 | (4) Days survived under-5 2015-17 |
|---|---|---|---|---|
| Total effect IV | 0.74 | 2.20 | -4.04 | -1.15 |
| | (3.84) | (4.96) | (3.01) | (7.27) |
| Control Mean | 31.82 | 46.84 | 19.21 | 1,753.45 |
| Observations | 13,191 | 13,192 | 13,102 | 13,154 |

*Notes:* This table reports estimates of spillover effects of the cash transfers on non-recipients of cash (both ineligible households and eligible households in control villages) on mortality for births across 2015-2017. Estimates are constructed using a spatial instrumental variable approach. Spatial HAC standard errors in parentheses. * $p < .10$, ** $p < .05$, *** $p < .01$.