

# Using phone surveys to assess mortality



**Evidence from Bihar, India**

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# Introduction



- Multiple (complementary) sources of mortality information in India
- Uncertainty about mortality impact, despite recent attempts
  - Especially at the state level
- Promise of phone surveys
  - Lower costs
  - Surge in interest during pandemic
  - Increases in mobile phone coverage
  - Easier implementation for continuous surveillance
- Limited use in mortality surveillance
  - Mortality is a rare event
  - Given lower response rates, large sample sizes can still cost quite a bit

# Roadmap for this presentation



**01** **Pilot survey**  
Description & results

**02** **Ongoing survey**  
Approach & basic summary  
statistics

**03** **Phone surveys**  
Limitations & potential fixes

**04** **Path forward**  
Survey completion & plans  
for analysis

# Pilot survey: Description



- Implemented in June 2021 in Bihar
  - Bihar is one of India's poorest and largest states (pop. ~120 million)
  - Mortality surge due to second wave in June 2021
- Question: deaths of any members in household since April 1, 2021
  - 505 households, 17 deaths
  - We calculate person-years of exposure (denominators) based on household size
  - Assuming dead members died in the middle of the exposure period
- Mobile phone numbers were scraped from an administrative dataset
  - Beneficiaries of the Public Distribution System (PDS) in Bihar
    - 80% of rural households are covered under the PDS
    - Approx 60% have phone numbers in our dataset
    - Our contact rate was 41%
  - We did not weight our estimates in the pilot

# Pilot survey: Results

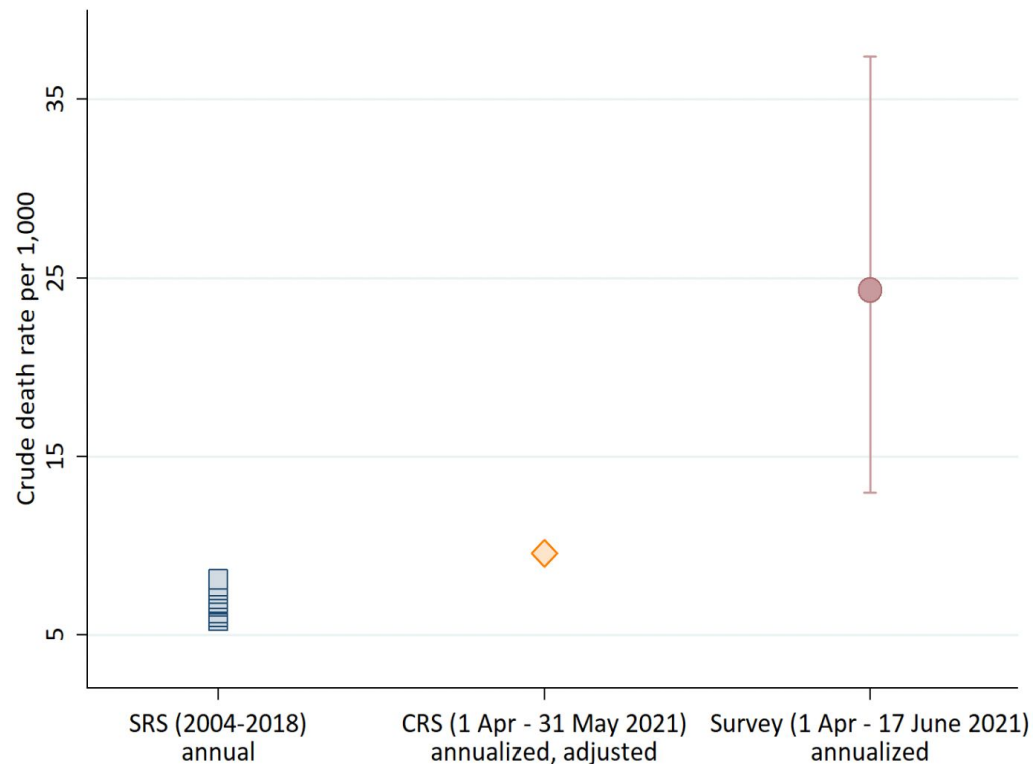


Observed annualized Crude Death Rate of 24.3 deaths per 1,000 [95% CI 13.0-37.4] during the second surge of the pandemic in Bihar; more than four times baseline mortality (5.8 deaths per 1,000 per year).

Comparison of crude death rate observed in the phone survey with:

- Baseline rates observed in the Sample Registration System
- Adjusted rates observed in the Civil Registration System, used in current estimates of excess deaths

Figure 1: Large increase in death rates in Bihar in April-June 2021



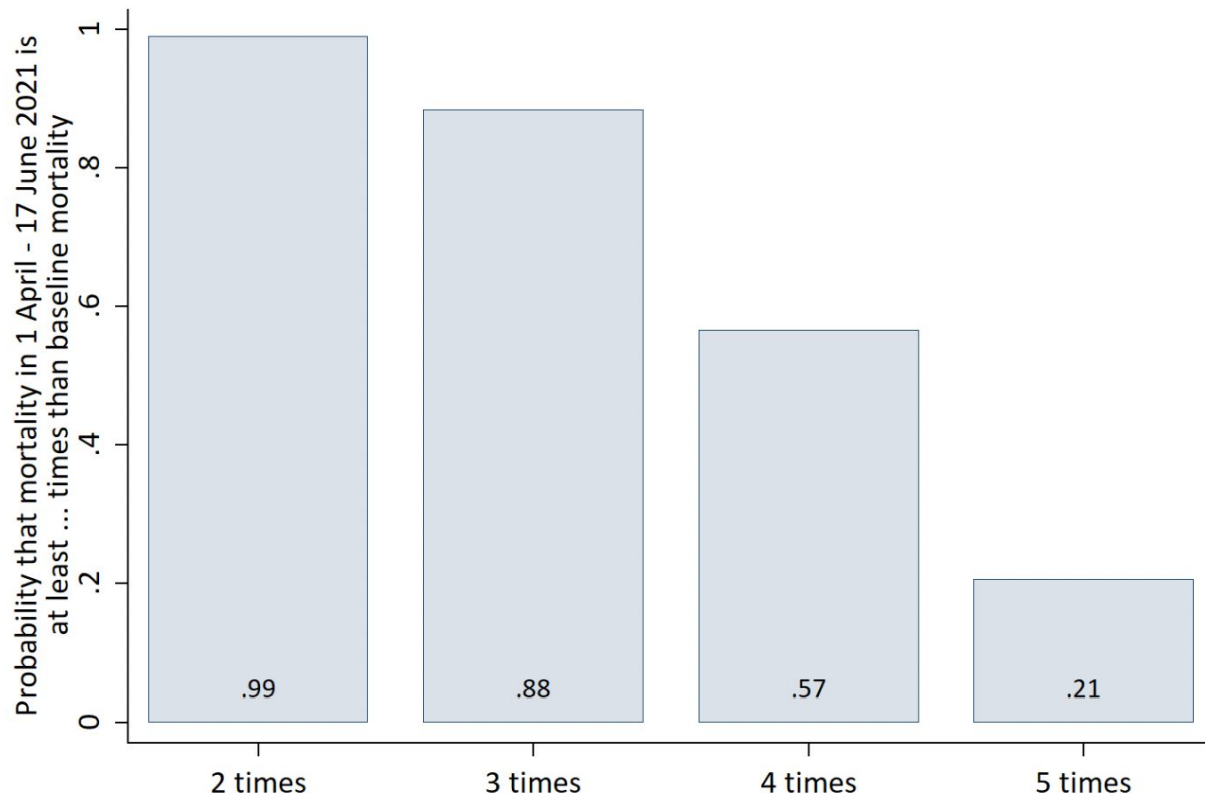
Note: Sample Registration System (SRS) covers a sample of 374,000 people in Bihar. Civil Registration System (CRS) covers all of Bihar, but 51.6% of deaths were estimated to be registered in 2019. Adjusted April-May 2021 estimates from the Civil Registration System (CRS) are annualized Crude Death Rates. They are adjusted by the inverse of the rate of completion of death registration in 2019 in the CRS. This estimate assumes that the increase in unregistered deaths was the same as the increase in registered deaths. Survey estimate are from a survey of beneficiaries in the Public Distribution System.

# Pilot survey: Results



Despite a small  
sample size . . .

**Figure 2:** High probability that mortality during second surge in Bihar was at least 3 times baseline mortality



Note: Graph shows probabilities of annualized crude death rate in 1 Apr - 17 Jun 2021 being 2-5 times baseline mortality (5.8 deaths per 1,000 in 2018). Calculations are based on 1,000 bootstrap samples.

# Ongoing survey: Approach

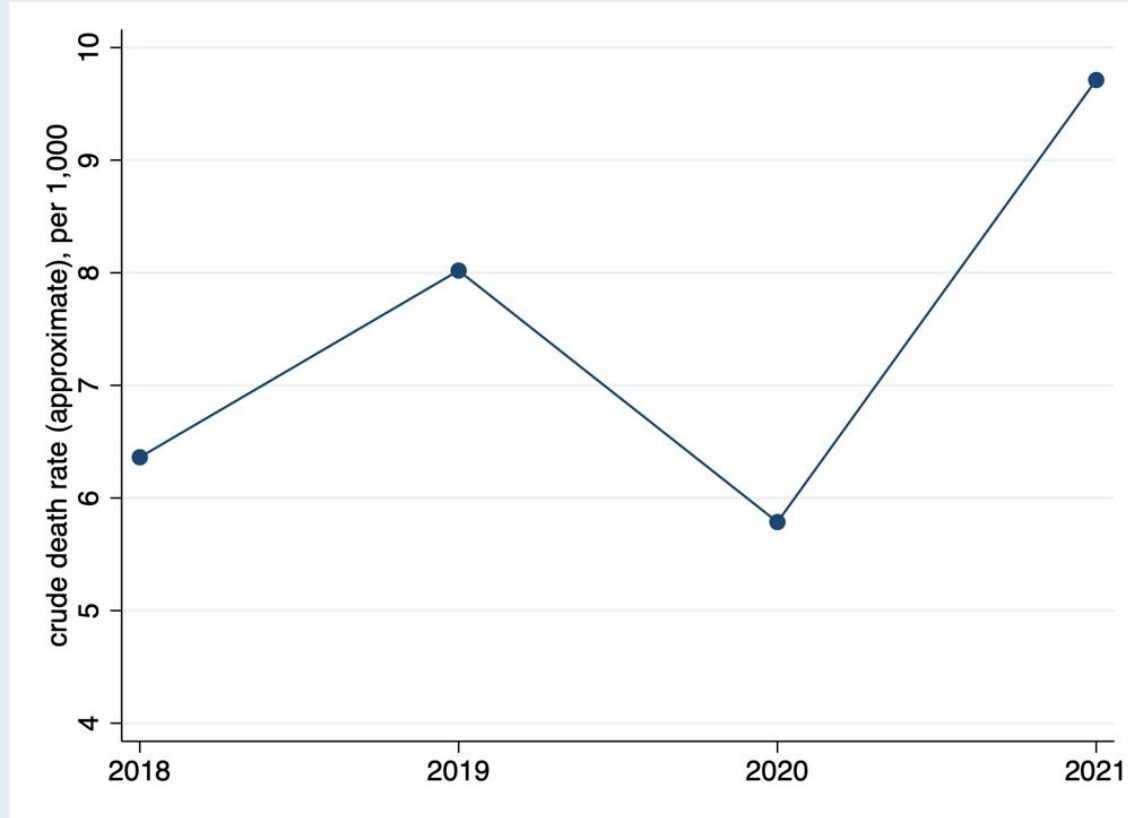


- Bihar Mortality Assessment Phone Survey (B-MAPS), funded by University of Pennsylvania Institute for the Advanced Study of India (UPIASI)
- Sample size > 10,000 households; estimated cost ~ USD 45,000
- Sampling frame: administrative dataset of Public Distribution System beneficiaries
- Question on deaths in the household in the last four years
  - Whether death was registered
- Question on last death in the household if no death in the last four years
- Piloted multiple ways to measure exposures
  - Summary household size
  - Number of household members by sex and age group
  - Detailed enumeration of household members by age and sex
- Also ask respondents to report births and still-births in last four years
- Additional questions of interest (education, healthcare, governance) implemented in sub-samples

# Ongoing survey: Basic summary statistics



- Survey duration: ~15 minutes
- Observed death rate (approx.): 7.95 deaths per 1,000 in last 4 years
  - We have not calculated accurate person-years by year yet
- 4,847 interviews conducted, 940 deaths observed in the last 4 years





# Phone surveys: Limitations & potential fixes



- Concern: Non-representative samples (low contact rates)
  - Recommendation: ideally, derive “cleaner” estimates from a small random sample (“gold standard”)
    - Invest resources to sample up to 80% of households in a separate gold-standard sample
    - Include households who are without a phone number & those with a phone who are unreachable
    - Can then “correct” for estimates with the fuller sample using gold-standard sample estimates
- Concern: Women are harder to reach over the phone
  - Responses to mortality questions in household may not vary by gender but this needs to be tested
  - Our mortality roster is pretty comprehensive
- Concern: Is mortality a “sensitive” question to deal with over the phone?
  - Start with broader questions, build familiarity
  - Enumerators need to be trained well
  - Pilot + early results show problem is not insurmountable

# Path forward



- Completing the survey (~ Aug 2022)
- Estimate:
  - Extent to which baseline death rates (2019) match existing estimates (SRS)
  - Overall excess mortality in 2020 and 2021
    - By age group
    - By social group
  - Extent to which deaths were registered
- Weights, representativeness in our sample, and other implementation lessons
  - Measure mortality in a representative sample in Bihar and compare our results
  - Compare weighted estimates with unweighted ones

# Thanks



Look forward to your feedback!

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