Early Life Experiences and Adult Fertility Behavior: Evidence from Indonesia

Dhanushka Thamarapani (Clark University)
Marc Rockmore (Clark University)
Willa Friedman (University of Houston)

UNU-WIDER Conference on Human Capital and Growth
June 6, 2016
What are Early Life Experiences and Why Should We Care?

- Focus on shocks that happen within the family.
  - Death of a sibling (child mortality).
  - Mother having miscarriages or stillbirths (adverse fertility event).

- Why do early life experiences matter?
  - Early life shocks persistently change people’s preferences/behavior.
  - Help explain why ‘identical’ households respond differently to interventions.
What We Do

- If a child grows up in a family that has high child mortality or adverse events, when she is an adult
  - How many kids (pregnancies) will she have?
  - What other changes will she make in her adult behavior?

- Extend the intuition to understand formation of fertility choices and preferences.

- Re-examine demographic transitions.
  - Micro perspective to the macro economic phenomenon.
What We Find: A Preview

- Strong inter-generational persistence of fertility
  - Adult births: magnitude of 15 to 38% of avg. no. of pregnancies
  - Related: Age of first marriage
  - Channels: Some effect of mental health

- Effect varies based on the age of exposure

- Inter-generational transfers: earlier literature on physical and human capital
  - Experience growing up in a family shape adult behavior
Data: Indonesian Family Life Survey (IFLS)


- 7224 households across 13 provinces encompassing 83% of the Indonesian population.

- Link 1\textsuperscript{st} and 2\textsuperscript{nd} generation
  - Family (mother) birth histories.
  - Siblings – education, marriage, employed (adult outcomes).
Sample of Daughters

  - Typically unmarried.
  - Marriageable and child bearing age.
- Why daughters?
  - Fertility outcomes are recorded for married women.
  - Son’s wife and mother-in-law must be panel respondents (low likelihood).
- At least two daughters who fulfill the above criteria.
  - Sibling fixed effect.
Empirical Model: Sibling Fixed Effect

**Outcome** \(i_k = \alpha + \beta \text{Adverse}_{i_k} + \gamma \text{Controls}_{i_k} + FE_{i_k} + \varepsilon_{i_k}\)

- For daughter \(i\) in municipality \(k\)
- **Outcome** (of daughter as adult):
  - Number of pregnancies ➔ \(\beta\) positive
  - Age at first marriage ➔ \(\beta\) negative
- **Adverse** (event of mother):
  - No. of child deaths (sibling)
  - No. of miscarriages or stillbirths
  - Age of daughter at time of event: 0-4, 5-9, 10-14 (5 year interval)
- Identification strategy
  - Variation in timing of exposure to the mother’s adverse event.
Empirical Model: Sibling Fixed Effect

\[ \text{Outcome}_{ik} = \alpha + \beta \text{Adverse}_{ik} + \gamma \text{Controls}_{ik} + FE_{ik} + \varepsilon_{ik} \]

- **Controls**: Characteristics of
  - daughter (birth order, ability to conceive, education, work, per capita consumption exp. and rural – round 4)
  - daughter’s husband (age, education, work, lives at HH)
  - Community (round 4 – access to contraception, family planning)

- **FE (fixed effects)**:
  - Comparing siblings \(\rightarrow\) sibling FE
  - Municipality (round 4) \(\rightarrow\) municipality FE
  - Age of daughter \(\rightarrow\) birth year FE
## Main Results – Fertility Outcomes

<table>
<thead>
<tr>
<th>Number of Pregnancies</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of deaths seen (age 0 to 4)</td>
<td>0.441***</td>
</tr>
<tr>
<td>(age 0 to 4)</td>
<td>(0.002)</td>
</tr>
<tr>
<td>No. of deaths seen (age 5 to 9)</td>
<td>0.416***</td>
</tr>
<tr>
<td>(age 5 to 9)</td>
<td>(0.002)</td>
</tr>
<tr>
<td>No. of deaths seen (age 10 to 14)</td>
<td>1.061***</td>
</tr>
<tr>
<td>(age 10 to 14)</td>
<td>(0.004)</td>
</tr>
<tr>
<td>No. of adverse fertility events (age 0 to 4)</td>
<td>0.170***</td>
</tr>
<tr>
<td>(age 0 to 4)</td>
<td>(0.002)</td>
</tr>
<tr>
<td>No. of adverse fertility events (age 5 to 9)</td>
<td>-0.158***</td>
</tr>
<tr>
<td>(age 5 to 9)</td>
<td>(0.002)</td>
</tr>
<tr>
<td>No. of adverse fertility events (age 10 to 14)</td>
<td>0.401***</td>
</tr>
<tr>
<td>(age 10 to 14)</td>
<td>(0.003)</td>
</tr>
<tr>
<td>Observations</td>
<td>773</td>
</tr>
</tbody>
</table>

Standard errors in parentheses

*** $p<0.01$, ** $p<0.05$, * $p<0.10$
## Main Results – Fertility Behavior

<table>
<thead>
<tr>
<th>Age at 1st marriage</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of deaths seen (age 0 to 4)</td>
<td>0.134***</td>
<td>(0.008)</td>
</tr>
<tr>
<td>No. of deaths seen (age 5 to 9)</td>
<td>-0.287***</td>
<td>(0.011)</td>
</tr>
<tr>
<td>No. of deaths seen (age 10 to 14)</td>
<td>-0.452***</td>
<td>(0.013)</td>
</tr>
<tr>
<td>No. of adverse fertility events (age 0 to 4)</td>
<td>-0.396***</td>
<td>(0.010)</td>
</tr>
<tr>
<td>No. of adverse fertility events (age 5 to 9)</td>
<td>-0.996***</td>
<td>(0.008)</td>
</tr>
<tr>
<td>No. of adverse fertility events (age 10 to 14)</td>
<td>-1.461***</td>
<td>(0.011)</td>
</tr>
<tr>
<td>Observations</td>
<td>773</td>
<td></td>
</tr>
</tbody>
</table>

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.10
The Results are Robust to

- Categorizing the age groups by 4 year intervals (vs. 5 year) [Table]
  - Age 0 to 3, 4 to 7, 8 to 11, 12 to 15

- Sibling sample
  - Re-run without sibling FE

- Selection into marriage [Table]
Heterogeneity: Do daughters respond differently based on

- The gender of the deceased sibling?
  - Does losing a brother have the same effect as losing a sister?

- The income status of the family when growing up?
  - Do wealthier families respond differently than poorer families based on the gender of the deceased sibling?

- Divide the households into two groups and binary variable "Below"
  - Below the median income of the municipality → poorer HHs (Below = 1)
  - Above the median income of the municipality → wealthier HHs (Below = 0)
Heterogeneity Summary: Number of Pregnancies

- **Deceased sister**
  - Wealthier HHs: 0.573 more pregnancies (50% of the avg. no. preg.)
  - Poorer HHs: 0.167 less pregnancies (15%)

- **Deceased brother**
  - Wealthier HHs: 0.172 less pregnancies (15%)
  - Poorer HHs: 0.493 more pregnancies (43%)

  - Son preference literature: missing women in India, sex-ratio in China
  - Potential reasons: agriculture, property endowment law

[Table]
Mechanisms: what is driving the results?

- **Fertility preferences** [Table]
  - Desired number of children over lifetime
  - Overall number unchanged → stockpiling of pregnancies

- **Mental health (depression)** [Table]
  - Measured at the time of survey using CES-D test
  - Categorical variable: 0 – 30 (higher the value higher the depression)
  - Sibling deaths: some evidence on higher depression level when adult

- No clear evidence on
  - Risk preferences: likely to be more risk averse?
    - Measured by standard lottery games
  - Time preference: likely to be more impatient?
    - Measured by standard lottery games
What Does This Mean?

- Early life experiences persist across time (fertility)
  - Effects are large as share of daughter’s fertility
  - Need to calculate as share of overall fertility transition

- Policy
  - May explain why ‘identical’ households respond differently to interventions
  - Underestimating (intergenerational) benefits of health interventions

- Pathways
  - Some evidence of mental health but only for sibling deaths
Thank You