Early Life Experiences and Adult Fertility Behavior: Evidence from Indonesia

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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)

- 4 rounds: 1993, 1997, 2000, 2007 (Tracking individuals across 14 years).
- 7224 households across 13 provinces encompassing 83% of the Indonesian population.
- Link 1st and 2nd generation
  - Family (mother) birth histories.
  - Siblings – education, marriage, employed (adult outcomes).

Sample of Daughters

- Aged 9 – 17 in round 1 (1993).
  - Typically unmarried.
- Appear in round 4 (2007): 23 to 31.
  - 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

$$Outcome_{ik} = \alpha + \beta Adverse_{ik} + \gamma Controls_{ik} + FE_{ik} + \varepsilon_{ik}$$

- For daughter *i* in municipality *k*
- $Outcome$ (of daughter as adult):
  - Number of pregnancies → β positive
  - Age at first marriage → β 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

$$Outcome_{ik} = \alpha + \beta Adverse_{ik} + \gamma Controls_{ik} + FE_{ik} + \varepsilon_{ik}$$

- $Controls$: 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 → sibling FE
  - Municipality (round 4) → municipality FE
  - Age of daughter → birth year FE

Main Results – Fertility Outcomes

Number of Pregnancies	
No. of deaths seen (age 0 to 4)	0.441***
	(0.002)
No. of deaths seen (age 5 to 9)	0.416***
	(0.002)
No. of deaths seen (age 10 to 14)	1.061***
	(0.004)
No. of adverse fertility events (age 0 to 4)	0.170***
	(0.002)
No. of adverse fertility events (age 5 to 9)	-0.158***
	(0.002)
No. of adverse fertility events (age 10 to 14)	0.401***
	(0.003)
Observations	773
Standard errors in parentheses	
*** p<0.01, ** p<0.05, * p<0.10	

Full table

Main Results – Fertility Behavior

Age at 1st marriage	
No. of deaths seen (age 0 to 4)	0.134***
	(0.008)
No. of deaths seen (age 5 to 9)	-0.287***
	(0.011)
No. of deaths seen (age 10 to 14)	-0.452***
	(0.013)
No. of adverse fertility events (age 0 to 4)	-0.396***
	(0.010)
No. of adverse fertility events (age 5 to 9)	-0.996***
	(0.008)
No. of adverse fertility events (age 10 to 14)	-1.461***
	(0.011)
Observations	773
Standard errors in parentheses	
*** p<0.01, ** p<0.05, * p<0.10	

Full table

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