

# Long-Term Effects Of The 1959-1961 China Famine: Mainland China and Hong Kong

Douglas Almond、Lena Edlund、Hongbin Li &Junsen Zhang

2020 年 5 月 15 日

# Abstract

This paper estimates the effects of maternal malnutrition exploiting the 1959-1961 Chinese famine as a natural experiment. In the 1% sample of the 2000 Chinese Census, we find that fetal exposure to acute maternal malnutrition had compromised a range of socioeconomic outcomes, including: literacy, labor market status, wealth and marriage market outcomes. Women married spouses with less education and later, as did men, if at all. In addition, maternal malnutrition reduced the sex ratio (males to females) in two generations – those prenatally exposed and their children – presumably through heightened male mortality. This tendency toward female offspring is interpretable in light of the Trivers-Willard (1973) hypothesis, according to which parents in poor condition should skew the offspring sex ratio toward daughters. Hong Kong natality micro data from 1984-2004 further confirm this pattern of female offspring among mainland-born residents exposed to malnutrition in utero.

# Problem

Evidence on the causal effects of fetal nutrition, however, is surprisingly scarce.

# 1.1 Introduction:Background

1959 年秋季开始的饥荒影响整个中国全境，导致粮食减产，一直持续到 1962 年出生和死亡率才恢复正常。有很多原因：天灾、人祸 (大跃进被认为是主因)

分为两个部分：流行病学研究和经济学研究

- 流行病学：针对健康的 Y 变量
- 经济学：对生存者的社会经济产出的影响 (CHNS)，但是存在一些缺点。

数据 1:2000 年 1% 人口普查的数据, Y 变量: 受教育程度、职业地位、居住信息、个体特征 (性别、出生年月、婚姻和生育信息)

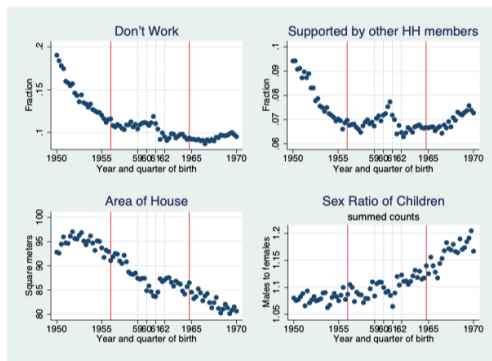
数据与 CHNS 的不同点在于减少了一些混杂因素: 迁移,2000 年普查数据优势多, 将样本限制在 1956-1964 年间, 饥荒前三年和后三年

数据 2: 香港 1984-2004 年出生记录的微观数据: 包含母亲出生的城市, 将样本限制在 1957-1965 年出生在香港或者大陆的单身母亲 (600000 个样本), 1/3 的样本来自大陆, 香港的样本提供了一个很好的对照组, 因为大陆全境在当时都遭受了饥荒。

## 2.1 Measuring the Famine

- 死亡率 (Death rate): 根据 2000 年的普查数据有各省各年各年龄段的死亡数据, 构建两个变量以代表饥荒的严重程度。加权死亡率 (Weighted death rate)  $wdr_{jt}$  例子: 一个 1960 年 1 月出生在北京的人: 分配到  $1/9$  的 1960 年的北京死亡率 +  $8/9$  的 1959 年北京死亡率 (从怀孕到出生 9 个月)
- 总加权死亡率  $awdr_t$  we collapse this weighted death rate by month of birth, thus calculating a population weighted national average for each month and year, henceforth “aggregate weighted death rate”
- 平均月出生率

# Result: Descriptive Results



2000 年的统计微观数据显示: 在 1960 年前后出生的人, 与同期预测相比有更差的社会经济产出。在 1960 年出生的人在 2000 年普查时特征: 没有工作; 受其他家庭成员支持; 住在很小的地方; 女童的父母



# Result: Regression Results

$$y_{it} = \beta_0 + \theta \text{ awdr}_t + \beta_1 YOB + \beta_2 YOB^2 + \beta_3 YOB^3 + \lambda_{\text{province}} + \varepsilon_{it}$$

$y_{it}$  代表  $t$  时期出生的  $i$  个体的结果变量,  $\text{awdr}_t$  表示按出生年份和出生月份计算的总加权死亡率;  $YOB$  出生年份, 加入平方和立方项控制非线性趋势 (图五的四幅图);  $\lambda_{\text{province}}$  省的虚拟变量, 由于出生月份存在明显的内生性, 所以不包括月份的虚拟变量

# Result: Regression Results

Table 1: 2000 Census: Labor and Housing Outcomes for 1956-

## 1964 Birth Cohorts

	Illiterate	Don't work	Disabled	Dependent	House area
	<u>Women</u>				
mean	0.081	0.189	0.004	0.119	87.162
awdr	0.5052**	0.4714***	0.0448*	0.3972***	-220.1528***
	[0.2169]	[0.1530]	[0.0250]	[0.1354]	[48.4753]
N	786156	786156	786156	786156	772260
	<u>Men</u>				
mean	0.021	0.082	0.006	0.019	83.933
awdr	0.1585*	0.4017***	0.0657	0.1399**	-104.7566**
	[0.0784]	[0.1131]	[0.0426]	[0.0674]	[38.3963]
N	818103	818103	818103	818103	790342

awdr – aggregate weighted death rate by birth year and month.

mean – mean of dependent variable.

Standard errors clustered at province of birth in square brackets. \* signif-

icant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

Greater famine intensity is associated with a higher likelihood of being illiterate and not working.

awdr 提高 1.2 个百分点, 意味着: 饥荒经历的女性有  $0.502 \times 0.012 / 0.081 = 7.5\%$  的可能性是文盲, 但是这个普查的数据没有其他直接的关于收入的数据

# Result: Regression Results

Table 2: 2000 Census, Marriage Market Outcomes, 1956-1964

## Birth Cohorts

	Unmarried	Never married	Spousal ed. <sup>a</sup>	Marriage age <sup>b</sup>	Household head <sup>c</sup>
<u>Women</u>					
mean	0.061	0.004	9.057	269.237	0.118
awdr	0.2608	-0.0013	-6.3342**	67.4994**	-0.0998
	[0.1632]	[0.0249]	[2.4652]	[28.5417]	[0.1633]
N	786156	786156	685989	783015	786156
<u>Men</u>					
mean	0.090	0.039	8.060	290.898	0.870
awdr	0.4902***	0.2676**	-0.1692	125.1309***	-0.5145**
	[0.1285]	[0.1035]	[2.5349]	[28.5395]	[0.2302]
N	818103	818103	683041	785927	818103

awdr – aggregate weighted death rate by birth year and month.

mean – mean of dependent variable.

表 2 主要研究对于婚姻市场的影响：对于女性而言不显著，但是女性更易的伴侣通常的教育程度更低，但是男性更易受到影响：未婚等，结婚年龄的影响，主要解释：婚姻市场挤压

# Result: Regression Results

Table 3: 2000 Census: Sex Ratio outcomes, 1956-1964 Birth Cohorts

horts

	Male <sup>a</sup>	Women <sup>b</sup>	
		Sons/Kids	No child
mean	0.51	0.548	0.007
awdr	-1.3147*** [0.2651]	-0.3194** [0.1368]	0.0712 [0.0503]
N	1604259	773291	786156

awdr – aggregate weighted death rate by birth year and month.

mean – mean of dependent variable.

<sup>a</sup> Dummy – equals 1 if respondent was male.

<sup>b</sup> Pertains to children borne.

Standard errors clustered at province of birth in square brackets. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

男性死亡率提高，母亲经历过饥荒的越严重，后代中女性更多，因此需要香港数据进行验证

# Result: Geographic variation in Famine intensity



