The Long-Run Health and Economic Benefits of Universal Health Insurance in Japan

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This research studies the long-run impacts following the onset of universal insurance in Japan in 1961. Focusing on health and economic outcomes, I compare cohorts borne shortly before and after the reform and hence differentially exposed to universal insurance early in life. I find that exposure had significant impacts on health in prime age, reducing chronic conditions such as diabetes and hypertension for women and cancer-related mortality for men. Moreover, exposure increased the share of women with college education, and the education gain increased women's employment and earnings relative to men as well as women's marital outcome measured by the education attainment of her spouse. As full-time employment increased, the homemaker's role shifted to men within households. Universal insurance thus contributes to an inclusive and equitable society with improved socio-economic status of women.

Economics

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１．研究開始当初の背景
(1) Universal health coverage is one of the Sustainable Development Goals of 2030, and many low-and-middle income countries are pushing for reforms achieving universal insurance. The impacts of universal insurance could be far-reaching, but current empirical evidence typically centers around the short-term benefits whereas long-run impacts are not directly observable until decades after the original reform. To inform policy, this paper exploits the historic onset of universal insurance in Japan to estimate the long-run impacts on health and economic well-being. The results contribute to a growing literature on universal insurance and have direct implications for reforms expanding insurance.

(2) Policy background: Universal insurance was implemented in Japan over a 5-year period between 1956 and 1961. During this period, prefectures across Japan expanded public insurance to cover individuals without private insurance, so that universal insurance should be implemented in all prefectures by 1961. The accelerated expansion during the reform substantially increased insurance rates across Japan (68% to universal in the median prefecture), with greater increases in prefectures with initially low rates of coverage (50% to universal in the lowest quartile of 1955 insurance).

２．研究の目的
(1) The research aims to shed light on the health and economic impacts of universal insurance in the long run. The interest in long-run impacts is motivated by findings that investments early in life can have persistent impacts over the life cycle, and that evidence coming from the roll-out of universal insurance is still limited in the literature. The research fills this gap exploiting the onset of universal insurance in Japan.

(2) In addition to estimating the overall impacts of insurance, the research also aims to examine the gender inequality in health and employment that may have been shaped by universal insurance. This is interesting because women were traditionally covered as the dependent of husband's insurance from work. Increased public investments may have increased women's socio-economic status via gains in education, employment, and earnings relative to men. A second objective is thus to examine the differential impacts of universal insurance by gender.

３．研究の方法
(1) The key relationship I study is the exposure to universal insurance early in life and the health and economic outcomes in prime age. I focus on exposure in the critical investment period (age 0-5) and examine whether later-life outcomes differed across early-life exposure for cohorts born shortly before and after the reform.

(2) In detail, I use two sources of variation driven by the reform. First, relative to the onset of universal insurance in 1961, cohorts born after 1961 were fully exposed to universal insurance whereas those born in earlier years had lower exposure. Second, exposure increased more in prefectures with initially low insurance rates in 1955 and less in those already with near-universal rates before the reform. The difference across cohorts and the cross-sectional differences by 1955 insurance rates are captured in the exposure measure by birth cohort and prefecture.

(3) I also account for the potential endogeneity of exposure due to the differential growth rate of insurance across prefectures. One concern is that the rate of insurance expansion over time could be correlated with economic and demographic factors that have independent impacts on the long-run outcomes of interest. To address this concern, I simulate insurance exposure imposing equal expansion speed between 1956 and 1961. By construction, the simulated exposure is solely driven by the pre-reform insurance rate and the timing to achieve universal insurance by 1961. Alternative factors that impact

the trajectory of expansion during this period are not captured in the simulated exposure. The main results are based on two-stage-least-square estimates using the simulated exposure as instrument.

４．研究成果
(1) Exposure to universal insurance early in life had significant impacts on health in prime age. In Table 1, TSLS estimates indicate significant reductions in chronic conditions such as hypertension and diabetes that were concentrated in women. A ten percentage point increase in exposure, for instance, reduced diabetes by 0.89 percentage points (26.3% below the mean) and reduced hypertension by 0.85 percentage points (8.1% below the mean).

(2) Table 2 shows significant reductions in overall mortality as well as disease-specific mortality. In column 1-2, gaining a ten percentage point exposure reduced crude mortality by 0.06 individual per 10 thousand individuals in prime age, or by 1.8% below the mean, and the effect is primarily driven by men. Across disease conditions, mortality from chronic conditions such as diabetes or hypertension did not differ with exposure. In contrast, cancer-related deaths decreased significantly by 0.06 individual primarily for men, and this effect explains nearly 95% (=0.56/0.59) of the overall reduction in mortality in prime age.

(3) Table 3 examines education attainment. For both genders, a ten percentage point exposure increased high school graduation rates by 1.3 percentage points, and increased college attainment for women by 1.1 percentage points. Moreover, exposure increased the education attainment of spouses for both genders: the probability of marring a college-educated spouse increased for women by 1.2 percentage points and increased for men by 0.7 percentage points.

(4) The education gain reduced the employment and earnings gaps by gender in Table 5. For women, a ten percentage point exposure increased full-time employment by 1.6 percentage points and reduced the share assuming the homemaker's role by 0.8 percentage points. For men, exposure had similar but opposite effects, roughly offsetting the impacts on women. In addition, earnings increased for women by 8.4% but decreased for men, and the overall income within household did not vary with exposure.

(5) The results show that exposure to universal insurance can reduce the gender inequality in socio-economic status through increased human capital and earnings of women. Corresponding to a ten percentage point gain in exposure, the education gap decreased by 4.5% between gender, and the gap in employment and earnings decreased by 5.7% and 8.3%, respectively. These long-run benefits on the socio-economic status of women remain significant under alternative controls in the paper.

Table 1: Impacts of insurance exposure on disease conditions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Hypertension		Diabetes		Cardiovascular		Cancer	
exposure	-0.047		-0.066**		0.002		0.002	
	(0.036)		(0.028)		(0.009)		(0.016)	
exposure· men		-0.008		-0.040		-0.002		-0.002
		(0.048)		(0.035)		(0.014)		(0.012)
exposure· women		-0.085**		-0.089***		0.007		0.007
		(0.040)		(0.027)		(0.011)		(0.023)
F-statistic	1,466.0	731.5	1,466.0	731.5	1,466.0	731.5	1,466.0	731.5
y mean	0.15		0.062		0.012		0.018	
N	67,763		67,763		67,763		67,763	

Notes: Table estimates the impact of early-life insurance exposure on disease conditions in prime age using two-stage- least-squares (TSLS) where the instrument is simulated exposure assuming equal expansions each year in 1956-1961. Separate effects by gender are shown in even-numbered columns. Standard errors clustered at the level of prefectures in the parentheses.

Table 2: Impacts of insurance exposure on mortality (per 10 thousand individuals)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Deaths		Hypertension		Diabetes		Cardiovascular		Cancer	
exposure	-0.59***		-0.006		0.003		0.050		-0.56***	
	(0.17)		(0.008)		(0.022)		(0.076)		(0.11)	
exposure· men		-1.13***		-0.010		0.004		0.10		-0.99***
		(0.21)		(0.010)		(0.029)		(0.090)		(0.12)
exposure· women		-0.037		-0.003		0.002		-0.003		-0.12
		(0.16)		(0.007)		(0.022)		(0.074)		(0.11)
F-statistic	1,572.3	786.1	1,572.3	786.1	1,572.3	786.1	1,572.3	786.1	1,572.3	786.1
y mean	3.32		0.007		0.058		0.40		0.46	
N	9,188		9,188		9,188		9,188		9,188	

Notes: Table estimates the impact of early-life insurance exposure on mortality in prime age using two-stage-least-squares (TSLS) estimates where the instrument is simulated exposure assuming equal expansions each year in 1956-1961. Separate effects by gender are shown in even-numbered columns. Standard errors clustered at the level of prefectures in the parentheses.

Table 3: Impacts of insurance exposure on education and marital sorting

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	High School		College Degree		Married to College-Educated Spouse		Married	
exposure	0.13***		0.047**		0.092***		0.063**	
	(0.032)		(0.021)		(0.015)		(0.029)	
exposure · men		0.13***		-0.012		0.066***		0.095***
		(0.032)		(0.025)		(0.018)		(0.030)
exposure · women		0.12***		0.11***		0.12***		0.030
		(0.033)		(0.026)		(0.020)		(0.033)
F-statistic	1,265.0	632.6	1,265.0	632.6	1,266.1	633.1	1,266.1	633.1
y mean	0.94		0.26		0.19		0.68	
N	329,502		329,502		331,397		331,397	

Notes: Table estimates the impact of early-life insurance exposure on education and marital sorting by prime age using two-stage-least-squares (TSLS) where the instrument is simulated exposure assuming equal expansions each year in 1956-1961. Separate effects by gender are shown in even-numbered columns. Standard errors clustered at the level of prefectures in the parentheses.

Table 4: Impacts of insurance exposure on employment and earnings

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Employed		Homemaker		Log Personal Earnings		Log Household Earnings	
exposure	0.019		0.008		-0.040		0.069	
	(0.024)		(0.026)		(0.16)		(0.085)	
exposure · men		-0.12***		0.095***		-0.90***		-0.022
		(0.025)		(0.016)		(0.13)		(0.093)
exposure · women		0.16***		-0.083**		0.84***		0.16
		(0.028)		(0.038)		(0.22)		(0.11)
F-statistic	1,265.8	633.0	1,265.8	633.0	1,265.1	632.6	1,265.1	632.6
y mean	0.69		0.12		4.72		5.82	
N	332,157		332,157		332,449		332,449	

Notes: Table estimates the impact of early-life insurance exposure on employment and earnings in prime age using two-stage-least-squares (TSLS) where the instrument is simulated exposure assuming equal expansions each year in 1956-1961. Separate effects by gender are shown in even-numbered columns. Standard errors clustered at the level of prefectures in the parentheses.

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