Health transition before and after 1995 health reform in Taiwan

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Objective

We examine the effect of health reform in 1995 in Taiwan on health transition among the elderly Taiwanese, including functioning, disability and death. Our research questions are:

1. Does any different pattern of age-specific transition rates exist before and after health reform?
2. If any effect is observed, to what extent does National Health Insurance (NHI) reduce health inequality resulting from different socioeconomic status (SES)?
3. Can we test the difference of health transitions before and after health reform?

Data

We employ a nationally representative longitudinal survey, the "Survey of Health and Living Status of the Middle Aged and Elderly in Taiwan" for analyses. The survey started in 1989 with follow-ups in 1993, 1996, 1999, 2003 and 2007. The sample was also refreshed (i.e., add-ins were made) in 1996 and 2003 to include individuals in the lower age group (ages 50+). For the purpose of clarity in the data analyses, this study uses the panel data starting from 1989 and excludes the refreshed sample. A total of 4049 individuals age 60 and older were interviewed at baseline. Over 90% of the interviews were completed in April or May, and less than 10% were conducted between June and October.

Measures

Physical functioning

Physical functioning was measured by difficulty in performing at least one of 6 items.

(1) Stoop/Squat

(2) Raise both hands over your head

(3) Use fingers to grasp or turn objects

(4) Lift or carry something weighing 11-12kg

(5) Walk for 200 to 300 meters

(6) Walk up two or three flights of stairs

Disability

Disability was measured by difficulties with activities of daily living (ADLs) and instrumental activities of daily living (IADLs). We used a composite measure combining both ADLs and IADLs in this study to obtain a more comprehensive range of disability measure. A total of one ADLs (bathing) and six IADLs (shopping, managing money, making phone calls, doing heavy housework, and using transportation) were used to construct a composite measure where an individual was considered as having a disability if he/she had difficulties in performing at least one of the activities.

Death

Respondents have been linked to a registry that provides date of death for individuals who died since the time of the interview.

Education

Education at the baseline interview was reported as single years of schooling for respondents. After taking into consideration the distribution of the variable, we coded education into three categories: no formal education, 1-6 years of formation education, and 7 and more years of formation education, where no formal education is the reference group.

Income

In order to obtain consistent income measure over waves, income was computed from sum of both respondent's and spouse's income. In our analysis, income was a categorical variable defined by the position of the whole distribution: [0,25%], (25%, 75%] and (75%, 100%], where the poorest is the reference group in the analysis.

Models

We ran hazard models over 3 to 4 years to analyze changes from no physical function problem to having difficulty in physical functioning, no ADL/IADL problem to disability, and alive to dead. We first looked at each interval with age as the only covariate and stratify by sex. Then, looked at each interval with age, sex, education and income controlled. In the end, we pooled interval observation and run the same model with additional control variable, that is, time and interval length. Below are our three models:

1. $\log(\mu)=\beta0+\beta1*age$, by sex and time interval
2. $\log(\mu)=\beta0+\beta1*age+\beta2*sex+\beta3*Edu+\beta4*Inc$, by time interval
3. $\log(\mu)=\beta0+\beta1*age+\beta2*sex+\beta3*Edu+\beta4*Inc+\beta5*time\ interval$

Results

1. Education on mortality: statistically significant difference between no formal education & highest education (7+ years) showed up after 1996 intervals.
2. Education on disability and physical functioning: the health inequality between no formal education and higher/highest education group(s) became statistically insignificant after health reform.
3. Income on disability, recovery from disability and recovery from physical functioning: the health inequality between least income and higher income groups became statistically insignificant since 1993-1996 interval

Conclusion

Highest education people benefited from national health insurance (NHI) more than the lower-education to get better mortality outcome. Because they were more likely to know when, how, and where the new technology, treatment, and medicine were available and, most importantly, covered by NHI and further utilize it, which was consistent with Link and Phelan's "fundamental cause" theory (1995).

As for disability and physical functioning outcome, NHI helps to eliminate the income gap by allowing the lower income groups to have better access to health care after health reform. According to Herd et al (2007), education is more predictive of the onset of physical health conditions, but income is more strongly associated with the progression of those. In our study, we see NHI helps to eliminate education gap on the onset of disability and physical functioning, and people with lower income also benefit from NHI by improved access to health care when they need after health reform in 1995.