Association between all-cause mortality and insurance status transition among the elderly population in a rural area in Korea: Kangwha Cohort Study

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ABSTRACT

The study purpose was to examine the association between health insurance transition and all-cause mortality. 3206 residents in Korea who participated in two surveys in 1985 and 1994, were followed-up during 1994–2008. Adjusted hazard ratios (aHR) were calculated using Cox hazard model. Participants were divided into four groups by insurance transition (the "National Health Insurance (NHI)–NHI", "NHI–Medicaid", "Medicaid–NHI", and "Medicaid–Medicaid" groups), where NHI–Medicaid means participants covered by NHI in 1985 but by Medicaid in 1994. For men covered by NHI in 1985, the mortality risk in the NHI–Medicaid was higher (aHR = 1.47) than in the NHI–NHI. For men and women, covered by Medicaid in 1985, aHR was non-significantly lower in the Medicaid–NHI than in the Medicaid–Medicaid. When four groups were analyzed together, men in the Medicaid–Medicaid (aHR = 1.67) and NHI–Medicaid (aHR = 1.46) groups had higher mortality risk than males in the NHI–NHI, whereas no significant difference was observed for females. In conclusion, transition from NHI to Medicaid increases mortality risk, and transition from Medicaid to NHI may mitigate risk, while remaining on Medicaid pose the greatest risk, especially for men. Therefore, policy makers should strengthen coverage for Medicaid. The weak effects of transition from NHI to Medicaid on mortality for women require validation.

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1. Introduction

In Korea, the National Health Insurance (NHI) and the Medical Aid (Medicaid) programs were first adopted in 1977 [1,2]. The first mandatory health insurance program for employees was started for companies with 500 or more employees in 1977, and was expanded to civil servants and educational staff in 1979, to companies employing 100 or more in 1981, and to companies employing 5 or more in 1988. In July 1981, the first pilot regional health insurance project was initiated in three rural counties, and this was followed in 1982 by a second pilot program in three another regions, which included Kangwha county. Regional health insurance was expanded to rural inhabitants in 1988 and nationwide in 1989. As such, universal coverage for Koreans was achieved in 1989. Meanwhile,

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Medicaid contributes to the social welfare and health of citizens with a low economic status and it helps them receive medical services at minimal or no cost. In 2010, 96.4% of all citizens were covered by NHI and 3.6% by Medicaid [3].

Nevertheless, despite mandatory universal medical coverage, public expenditure on health sector in Korea remains below the average for high income countries [4]. Furthermore, partly because of low benefit levels and high out-of-pocket costs, the prevalence of private insurance coverage has increased [1] and the proportion of households with catastrophic health expenditures (households spending more than 40% of income [remaining after subsistence needs have been met] on health) [5] rose to 2.9% in 2006–2007 in Korea [6,7]. Meanwhile, in Korea, despite NHI and Medicaid officially being in the same health care benefit bracket, payments to health care providers for Medicaid have been chronically delayed due to underfunding [2]. For example, accounts payable for Medicaid reached around 922 million US Dollars at the end of 2006 [8]. Additionally, because of different insurance cards as well as electronic systems for checking beneficiary status, providers can easily differentiate between the two groups.

Previous studies have reported that status of health insurance coverage affects health care utilization and health of the individuals [9–17]. In the US populations, children on Medicaid were denied appointments more frequently and waited longer for appointments [9], and patients with Medicaid is less likely to be offered local surgical care [11] than their counterparts with private insurance. Furthermore, medical insurance status has been reported to be a strong independent risk factor of late-stage disease at diagnosis [13], and mortality rates have been reported to be higher and survivals poorer for those on Medicaid or without medical insurance than privately insured individuals [14–17].

Few studies have addressed the effects of insurance status transition on access to care [18,19] or on health outcomes [20–23] as compared with the effects of insurance status per se. Schoen et al. showed that patients that were recently uninsured were at higher risk of going without needed care [20]. Changes in health insurance status cause greater distress, and an intermittent non-insured status is associated with an increased risk of a decline in overall health and poorer self-reported health as compared with the continuously insured [21–23]. However, the association between changes in health insurance and mortality has seldom been addressed in general populations. In this study, we prospectively examined the relationship between mortality and change in health insurance status among Korean rural residents.

2. Methods

2.1. Study population

This study was performed using data collated during the Kangwha Cohort Study [24,25]. From July to August 1994, 3592 (85.2%) of 4217 survivors (50 losses to follow-up and 2105 deaths as of July, 1994) of the 6372 who participated in the first survey in March 1985, participated in the second survey. After excluding those with missing health insurance statuses in 1985 or 1994 ($n = 329$), body mass index (BMI, $n = 46$), marital status ($n = 6$), or other variables ($n = 5$), 3206 participants (1291 males, 1915 females) were included in the analysis conducted during the present study. The Institutional Review Board of Human Research of Yonsei University approved the study (approval no. 4-2007-0182).

2.2. Baseline data collection

Trained researchers interviewed participants using a structured questionnaire to obtain demographic characteristics and health related information, including age at entry, gender, education, occupation, tobacco and alcohol use, chronic disease history, marital status, and insurance status at time of survey. Blood pressure, height, and weight were measured by a trained investigator. More details on data collection can be found elsewhere [24,25]. At primary survey, participants were asked whether they were covered by Health Insurance or Medicaid, whereas at secondary survey they were asked whether they were covered by Regional Health Insurance, Employee Health Insurance, or Health Insurance for Civil Servants and School Personnel (all 3 were part of the NHI scheme) or Medicaid. In Kangwha county, regional health insurance program was adopted in 1982 as a part of the second pilot project for national regional health insurance scheme.

Insurance status transitions were classified according to insurance statuses at the two survey points (1985 and 1994). People in the NHI program at both surveys were classified as "NHI–NHI", those in the NHI program in 1985 and the Medicaid program in 1994 were classified as "NHI–Medicaid", those in the Medicaid program at both surveys as "Medicaid–Medicaid", and those in the Medicaid program in 1985 and the NHI program in 1994 as "Medicaid–NHI". The numbers of participants in each group by gender were presented in Table 1.

2.3. Follow-up and outcome assessments

Deaths among subjects between July 1994 and December 2008 (inclusive) were confirmed using the death records at the National Statistical Office [24]. Follow-up was performed using record linkages at the national level, and was complete, except for emigrants.

2.4. Statistical analysis

Fisher's Exact test and one-way analysis of variance (ANOVA) were performed to compare differences between insurance transition status groups. The Cox proportional hazard model was used to calculate hazard ratios (HRs) and 95% confidence intervals (CIs). Analyses were adjusted for the following covariates: age at entry (continuous), BMI (kg/m^2, continuous), gender, known hypertension (yes/no), smoking status (never smoker, former smoker, current smoker), drinking status (current drinker, nondrinker), occupation (agriculture, other), education (never, elementary school, middle school or