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The dependence of health insurance availability on years left before Medicare

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Abstract

We study the dependence of health insurance availability of near-elderly inpatients in the United States with respect to their ages. We show that the likelihood that near-elderly inpatients are uninsured continuously declines until the early ages of 60 but the trend is reversed for the last few years preceding Medicare coverage. In addition, compared to those covered by Medicaid or private insurance, the uninsured patients are more likely to be admitted into hospitals as emergency cases.

Keywords: Health insurance; Medicare

JEL classification: I11

1. Introduction

In the United States, people become eligible at age 65 for Medicare. Thus, elderly adults have easier access to health care, and consequently they have higher utilization of health care services, as reported by Card et al. (2008). However, McWilliams et al. (2007) find that uninsured near-elderly adults are likely to require costlier care when covered by Medicare after 65. Furthermore, McWilliams et al. (2009) argue that the cost of expanding Medicare coverage to earlier ages can be partially off-set by reductions in later spending.

In this paper, we aim to show that the dramatic changes brought by Medicare eligibility are also likely to include an adverse effect on demand for health insurance during years prior to coverage by Medicare. To this end, we study the relation between the ages of the near-elderly inpatients in the United States and the estimated likelihood of their being uninsured. We show that this likelihood continuously declines until the early ages of 60; but the trend is reversed for the past few years preceding Medicare coverage. In addition, compared to those covered by Medicaid or private insurance, the uninsured patients are more likely to be admitted into hospitals as emergency cases. Our results predict that uninsured people who have just a few years left before Medicare may continue to decline purchasing health insurance and delay going to the hospital so long as it is possible.

The organization of the remainder of the paper is as follows: Section 2 introduces data and methodology. Section 3 contains our results and finally Section 4 concludes.

2. Data and methodology

In our study, we use Nationwide Inpatient Sample (NIS) from 1998-2005. NIS includes a 20% random sample of general medical and surgical acute care community hospitals, excluding military,

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uncategorized federal and prison hospitals. Out of around 38 states that participate in NIS each year, we drop the states that did not report inpatient's race and we use inpatient data from 29 states. To estimate the probability of being uninsured, we only consider the records of privately insured and uninsured inpatients. Out of 2556842 inpatient records, 10.6% include no insurance and 40.5% indicate female status. We also use Current Population Survey from 1998-2005 to calculate probabilities of employment status of inpatients.

Given the data, we consider the following logit model to estimate the probability of being uninsured:

$$E[U_{it}] = F\left(\beta_0 + \beta_1 A_{it} + \beta_2 C_{it} + \beta_3 EMERG_{it} + \beta_4 A_{it} * EMERG_{it} + \beta_5 Y_t + \beta_6 S_{it}\right), \tag{1}$$

where $i = 1, \ldots, 2556842$ represents the inpatient, $t = 1998, \ldots, 2005$ denotes the year, and $E[U_{it}]$ is the probability that inpatient i is uninsured in year t. In the same equation, $A = \langle age55, \ldots, age64 \rangle$ is a vector of indicator variables for ages between 55 and 64, C is a vector of variables representing inpatient characteristics including gender, race (white, black, hispanic, asian, native american or other race), major diagnostic category, Charlson Index of the inpatient and income quartile associated with the inpatient's zipcode. Finally, $EMERG$ is the dummy showing whether inpatient's admission type is emergency, and Y and S are indicator variables for year and state, respectively.

We include in the above model the employment status probabilities of the inpatient as controls. As we do not directly observe the employment status of inpatients, we calculate the probability of employment status using Current Population Survey given inpatients reported age, gender, year of admission and state.

A further question we ask in this study is whether a patient's admission to the hospital for emergency care, rather than urgent or elective care, depends on the prospect that he or she is uninsured, covered by Medicaid or privately insured. To answer this question, we use the following logit model:

$$E[EMERG_{it}] = F\left(\beta_0 + \beta_1 I_{it}^M + \beta_2 I_{it}^P + \beta_3 A_{it} + \beta_4 C_{it} + \beta_5 Y_t + \beta_6 S_{it}\right), \tag{2}$$

where I^M and I^P are the indicator variables for whether the inpatient's insurance type is Medicaid and private, respectively.

3. Results

Estimating equation (1), we report in Table 1 that the probability of being uninsured decreases up to the age of 61 and afterwards it increases and then stays constant, when controlled for year as well as inpatients' characteristics involving gender, race, income level, major diagnostic category, and state. This finding would suggest that as inpatients become closer to age 65, they are more likely to decline purchasing health insurance.

To control whether the decision of (not) purchasing health insurance is related to the employment status of inpatients, we have also included probabilities of being unemployed, full time employed, part time employed and retired in our estimations. Even though the observed shape of (the implied curve of) the probability of being uninsured with respect to age is preserved, this inclusion has resulted in multicollinearity and led to insignificant coefficients for the age variables because of the high correlation between the ages and the calculated probabilities of employment status of inpatients.

Table 1
Logit Regressions of P(being uninsured).

Variable	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
age55	0.094***	0.012	-0.065	0.293	0.07***	0.019	-0.107	0.292
age56	0.062***	0.012	-0.088	0.278	0.031	0.019	-0.137	0.277
age57	-0.005	0.011	-0.15	0.266	-0.161***	0.017	-0.322	0.266
age58	-0.028**	0.012	-0.161	0.249	-0.038*	0.02	-0.187	0.248
age59	-0.054***	0.012	-0.181	0.231	-0.077***	0.02	-0.218	0.231
age60	-0.059***	0.012	-0.162	0.196	-0.08***	0.02	-0.196	0.196
age61	-0.083***	0.012	-0.173	0.167	-0.093***	0.02	-0.194	0.167
age62	0.014	0.011	-0.036	0.089	-0.105***	0.018	-0.161*	0.09
age63	-0.003	0.012	-0.02	0.041	0.014	0.02	-0.006	0.043
female	0.043***	0.005	0.043***	0.005	0.043***	0.005	0.043***	0.005
Charlson Index	0.024***	0.003	0.024***	0.003	0.023***	0.003	0.023***	0.003
black	0.611***	0.006	0.611***	0.006	0.613***	0.006	0.613***	0.006
hispanic	1.048***	0.007	1.048***	0.007	1.046***	0.007	1.046***	0.007
asian	1.025***	0.021	1.025***	0.021	1.025***	0.021	1.025***	0.021
native american	0.373***	0.037	0.373***	0.037	0.392***	0.037	0.392***	0.037
other race	0.609***	0.013	0.609***	0.013	0.599***	0.013	0.599***	0.013
income1	1.047***	0.007	1.047***	0.007	1.053***	0.007	1.053***	0.007
income2	0.814***	0.006	0.814***	0.006	0.815***	0.006	0.815***	0.006
income3	0.399***	0.007	0.399***	0.007	0.4***	0.007	0.4***	0.007
emergency	0.764***	0.005	0.764***	0.005	0.646***	0.018	0.646***	0.018
emergency*age55					0.04*	0.024	0.039	0.024
emergency*age56					0.051**	0.024	0.051**	0.024
emergency*age57					0.241***	0.019	0.241***	0.019
emergency*age58					0.017	0.025	0.017	0.025
emergency*age59					0.037	0.025	0.037	0.025
emergency*age60					0.035	0.025	0.035	0.025
emergency*age61					0.017	0.025	0.017	0.025
emergency*age62					0.186***	0.022	0.186***	0.022
emergency*age63					-0.028	0.025	-0.028	0.025
prob. full time			-0.051	0.365			-0.082	0.365
prob. part time			-0.531	0.699			-0.571	0.697
prob. retired			-0.49	0.901			-0.561	0.899
prob. unemployed			-3.199*	1.745			-3.197*	1.739
constant	-3.078***	0.056	-2.718***	0.561	-3.013***	0.057	-2.605***	0.561
Number of obs.	2556842		2556842		2556842		2556842	
Pseudo R2	0.134		0.134		0.135		0.135	

NOTE: *, ** and *** denote significance at the 90%, 95% and 99% confidence levels, respectively. Major diagnostic category dummies, state and year fixed effects are included in all of the specifications. Standard errors (SE) are heteroscedasticity robust.

Among the near-elderly inpatients, the probability of being uninsured is the highest at age 55. The said probability decreases up to the age of 61 on average, and up to the age of 62 for inpatients whose admission type is not emergency. On average, the probability of being uninsured for a 61 year-old inpatient is 8% less than for a 64 year-old inpatient, whereas this probability is not significantly different for ages 62, 63 or 64, holding other factors constant.

We also find that inpatients living in low income locations have higher probability of being uninsured while whites among all race groups have the lowest estimated probability. Besides, females and inpatients with more serious health conditions (measured by higher Charlson index) and patients whose admission types are emergency are also significantly more likely to be uninsured.

Our results in Table 1 predict that near-elderly people become more and more likely to purchase private health insurance up to age 61-62, and less likely afterwards. Uninsured people who have just a few years left before Medicare may continue to decline purchasing health insurance and delay going to the hospital so long as it is possible. Indeed, these people are more likely to go to hospital when their health conditions become serious.

Finally, we estimate equation (2) to answer whether being admitted as an emergency case depends on the inpatient's insurance type.

Table 2
Logit Regressions of P(being admitted as an emergency patient).

Variable	Coeff.	SE
medicaid	-0.320 ***	0.006
private	-0.777 ***	0.005
female	-0.007 ***	0.003
Charlson Index	0.001	0.002
income1	-0.101 ***	0.004
income2	-0.125 ***	0.004
income3	-0.023 ***	0.003
black	0.639 ***	0.004
hispanic	0.428 ***	0.005
asian	0.233 ***	0.013
native american	-0.337 ***	0.021
other race	0.433 ***	0.008
constant	0.327 ***	0.035
age dummies	yes	
Major diagnostic category dummies	yes	
Year Fixed Effects	yes	
State Fixed Effects	yes	
Number of observations	3049230	
Pseudo R2	0.125	

NOTE: *, ** and *** denote significance at the 90%, 95% and 99% confidence levels, respectively. Standard errors (SE) are heteroscedasticity robust.

In Table 2 above, we observe that uninsured inpatients are the most likely while privately insured inpatients are the least likely to be admitted as emergency cases. (Medicaid inpatients are 27% and privately insured inpatients are 64% less likely to be admitted as emergency cases than uninsured inpatients, holding other factors constant). This result suggests that universal coverage would benefit uninsured patients from the point of health care as they would not wait till the point they can no longer stand not to go to the hospital.

4. Concluding remarks

We have found that even though near-elderly inpatients are more likely to be privately insured than uninsured before the early ages of 60, their likelihood of being uninsured is found to be higher as they become closer to age 65, when we control for other factors. A possible reason we suggest is that as people, over time, get closer to being covered by Medicare, they may tend to delay going to the hospital till they are covered, and they more frequently end up being admitted into the hospital as emergency cases.

The existence of adverse selection in health insurance is well established in the literature. (See for example, Van de Ven, 1987; Altman et al., 1998; Cutler and Zeckhauser, 1998). Our finding that amongst all near-elderly people, the oldest quartile, which naturally has the most serious health problems, is also the most likely to continue to decline purchasing health insurance may point to the potential benefits of future research to study dynamic incentive problems in health care markets.

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