GRADESHEET FOR ASSIGNMENT 1 -- EIPR

Name ___Sigi___

Total score ___40___ / 40

Your areas of weakness/areas for improvement are identified below.

Analysis — (10 points) Your score: _10_/10
Is the Stata analysis correct and concise? ✓
Were the right analytic tests performed? ✓
Are the regression models correctly specified? Is the printout readable? ✓
Was the output interpreted correctly? ✓
Are the data displays (table and figures) well-formatted and accurate, consistent with the guidance provided? ✓

If you received less than 9 points on this section, be sure to review "Making good tables and figures," which is on our website.

Writing — (10 points)   Your score: _10_ / 10
Is the memo written clearly and well-organized? ✓
Is it free of grammatical errors, spelling mistakes and malapropisms? ✓
Are bolding/italics used effectively? ✓
Are topic sentences used, with clear transitions? ✓
Last (and particularly important): Is the writing suited to the audience? ✓

If you received less than 9 points in this section, consider working with the Wagner Writing Center and/or taking some of their short courses on writing, while you're a graduate student. Good writing is a highly marketable skill.

Story — (20 points) Your score: _20_/20
Did the student clearly state the research question(s) at the outset? ✓
Is there a coherent connection between the analysis and the material in the memo? ✓
Did the student extract the "headlines? ✓
In discussing the findings in the tables, was the student able to offer a guiding narrative, or was detail emphasized? ✓
Is the conclusion clearly stated? Does it answer the question posed at the beginning of the memo? ✓
Was the relationship between the bivariate and multivariable impact estimate explained clearly? Very Good!
Did the students clearly identify major strengths/weaknesses/limitations?
   ✓ Internal validity   Good use of terminology from the class
   ✓ External validity
   Measurement

Well-organized, focused writing

1 **Introduction** *Could have used one sentence on Medicare program for context - e.g. why do people get supplemental insurance to begin with?*

2 Previous studies have raised concerns about the potential underutilization of care among those

3 without supplemental insurance. This study aims to assess the association between having

4 supplemental insurance and receiving more medical care under the Medicare program, as well as

5 to examine disparities in care between those with and without supplemental insurance. The

6 findings may or may not reveal the need to further promote equality in healthcare services.

7

8 **Methods** — *Very concise but hit all the major points*

9 This is a cross-sectional study of elderly(aged 65 and over) individuals in the Medicare program

10 in the US, and the sample is representative of the elderly population. The outcome of medical

11 care is measured by the dollar expenditures spent by the Medicare program, and outcomes are

12 compared between individuals with supplemental insurance (treatment group) and those without

13 (non-treatment group). Regression with covariate adjustment is used as a means of "recovering"
↳ would try to put this in your own words

14 the counterfactual. The covariates in this study include age groups, sex, race, income tercile,

15 educational attainment level, and general health status, which may be expected to be associated

16 with Medicare program expenditures. First, I used chi-square statistics to explore any differences

17 in characteristics between individuals with and without supplemental insurance. Then I use one-

18 way ANOVA test to explore how Medicare expenditures vary based on insurance status and

19 other characteristics. Finally, I applied adjusted linear regression to correct the unadjusted model
↳ multivariable

20 to estimate the impact of supplemental insurance on expenditures.
↳ might rephrase as "to assess the impact of SI on expenditures controlling for other factors."

21

22 **Findings and Discussion**

23 <u>**Relationship between covariates and supplemental insurance:**</u> Out of the 7927 sampled

[handwritten: 12.6% — Not sure where the math got off here]   *[handwritten: 86.3%]*

24   members, 921 (39.67%) had no supplemental insurance, and 6376 (60.33%) had it. As shown in

25   Table 1, groups with and without supplemental insurance differ significantly in characteristics

26   that could be associated with Medicare program expenditures. Black or other race individuals,

27   those with lower income levels, those with no more than a grade school education, and those in   *[handwritten: Good synthesis and use of examples]*

28   poor general health have a significantly higher risk of not having supplemental insurance. For

29   instance, 57% of individuals without supplemental insurance have a low-income level, compared

30   to only 30% of those with it. This may be because beneficiaries with lower incomes cannot

31   afford supplemental insurance and therefore take the risk of not purchasing it.

32

33   **Relationship between covariates and the Medicare expenditure:** Individuals without   *[handwritten: Good headline]*

34   supplemental insurance have a mean program expenditure of $4399, which is significantly less

35   than the mean annual Medicare expenditure of $5789, with a mean difference of $1390.   *[handwritten: for people with SI]*

36   However, the association between supplemental insurance and Medicare costs is not the only

37   factor to consider. Beneficiaries at and over the age of 70 have higher mean Medicare

38   expenditures than those under 70. Men have a higher mean Medicare expenditure than women,

39   with a difference of $778. Low and middle-income individuals have higher mean Medicare

40   expenditures than high-income individuals, and those in poor or fair health have higher mean

41   Medicare expenditures than those in better health. All the differences mentioned above are

42   significant at the .05 level.   *[handwritten: → usually you put this in the methods and then just say "significant" to mean that]*

43

44   **Relationship between the supplemental insurance and Medicare expenditure:** The first

45   column of Table 3 shows the unadjusted linear regression model, indicating that individuals with

46   supplemental insurance have, on average, $1391 more in Medicare expenditure than those

47   without, and the difference is statistically significant at the .05 level. Adjusting for covariates in

48   the second column, the difference increases to $2698, and remains statistically significant at the

49   .05 level. The unadjusted model has a downward bias. Covariates in the adjusted model account

50   for their positive relationship with expenditure and negative relationship with having

51   supplemental insurance, which affected the unadjusted model's estimation(Appendix).For

52   example, poor health condition increases medical expenditure irrespective of insurance status

is correlated

53   and correlates with a lower likelihood of having supplemental insurance.

54

Conclusions   *Answered both your study questions*

55

56   Having supplemental insurance is associated with receiving more medical care under Medicare

57   for US Medicare beneficiaries, controlling for age group, sex, race, total income tercile,

58   educational level, and general health status. Individuals who belong to the Black or other race

59   category, those with lower income levels, those who have received no more than a grade school

60   education, and those in poor general health are significantly more likely to have no supplemental

61   insurance. With future supportive evidence, the government may nudge policies to address the

62   disparities to help those underrepresented groups with their Medicare benefits.

63

64   **Limitations**   *Cross-sectional $\xrightarrow{x}$ causation*

65   First, there's a threat to the internal validity of this study. Other unmeasured differences between

66   groups without and with supplemental insurance that are correlated with Medicare expenditures

67   may also bias the estimates. Second, this study uses data from the year 2015, the Medicare

68   program and insurance may have changed, so results may change accordingly. Third, further

69   research can also include interactions between treatment and covariates in regression models.

measurement.

do greater expenditures mean3 less needed care for disadvantaged, or more unnecessary care for advantaged.

[margin notes:] Love the figure! technically some of these variable decrease expenditures, so might be better but you got the overall idea

TABLE 1
Distribution of supplemental insurance
By sociodemographic and health characteristics
Medicare beneficiaries aged 65+

	No supplemental insurance	Supplemental insurance
put significance here or add an additional column	n = 921	n = 6376
Age (years) (%)*		
65-69	20.96	23.56
70-74	18.46	21.68
75-79	20.41	21.14
80-84	19.76	19.24
85+	20.41	14.38
Sex (%)*		
Male	43.11	39.18
Female	56.89	60.82
Race/ethnicity (%)*		
Black	24.21	4.39
White	71.34	94.40
Other	4.45	1.21
Income tercile [1](%)*		
Low	56.68	29.94
Middle	32.79	33.42
High	10.53	36.64
Educational attainment (%)*		
Grade school.	48.21	23.84
High school	38.33	48.38
Beyond high school	13.46	27.78
General health (%)*		
Excellent	13.68	17.19
Very good	18.24	25.94
Good	28.56	31.62
Fair	25.08	18.62
Poor	14.44	6.63

column percents assessing balance

Chi-square is a globle test of significance

[1]Income terciles defined as follows: Low = $ ___0___ to $ _9617__; Middle = __9624____ to 17885_____; High = $__17900_____ to $__873413_____.

* p <.05 for a chi-square test of no association between supplemental insurance status and this characteristic.

Having no supplemental

4

TABLE 2
Annual Medicare expenditures
By supplemental insurance, sociodemographic and health characteristics
Medicare beneficiaries aged 65+,

	Mean Annual Medicare Expenditures ($)
Supplemental insurance (*)	
Has no supplement	4398.51
Has supplemental insurance	5788.58
Age (years) *	
65-69	4521.83
70-74	5442.38
75-79	5991.75
80-84	6421.90
85+	5969.38
Sex *	
Male	6082.22
Female	5304.63
Race/ethnicity	
Black	6369.02
White	5551.20
Other	5894.68
Income tercile (*)	
Low	5905.66
Middle	6020.46
High	4913.51
Educational attainment	
Grade school.	5514.26
High school	5799.88
Beyond high school	5376.80
General health (*)	
Excellent	2811.64
Very good	3671.78
Good	5161.11
Fair	7487.44
Poor	15204.80

Handwritten note: Focus on the main effect

* $p < .05$ for an ANOVA test of no difference between mean expenditures across groups defined by this characteristic.

TABLE 3
Regression coefficients from an OLS estimate of the impact of supplemental insurance on mean annual Medicare expenditures
(Unadjusted, Adjusted)
Medicare beneficiaries aged 65+

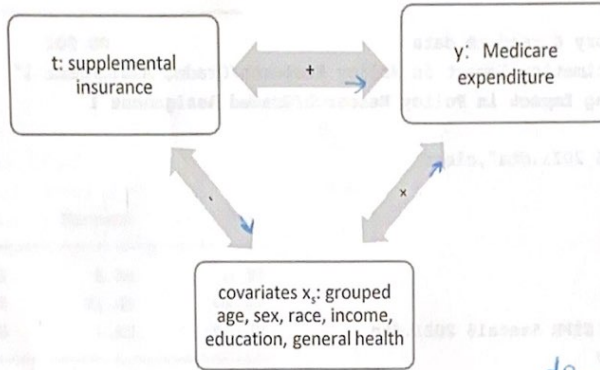|	Unadjusted	Adjusted
Supplemental insurance		
No supplement	---	---
Has a supplement	1390.07*	2698.10*
Age (years)		
65-69		---
70-74		949.86*
75-79		1362.21*
80-84		1988.47*
85+		1794.4*
Sex		
Male		---
Female		-1275.00*
Race/ethnicity		
Black		---
White		-988.93
Other		-80.65
Income terciles		
Low		---
Middle		-58.37
High		-571.99
Educational attainment		
Grade school.		---
High school		1463.56*
Beyond high school		1654.26*
General health		
Excellent		---
Very good		927.89
Good		2450.27*
Fair		4996.33*
Poor		12966.27*
Constant	4398.51	-78.49

* p < .05 for t-test of the hypothesis that b = 0 for this regression coefficient.

Comparing
you see an increase with the addition of covariates

6

Appendix
Diagram of relationships between treatment variable t, outcome variable y, and covariates x

```
┌─────────────────┐                    ┌─────────────────┐
│ t: supplemental │◄──────  +  ──────►│  y:  Medicare   │
│   insurance     │                    │   expenditure   │
└─────────────────┘                    └─────────────────┘
          ▲                                     ▲
           ◄                                   x ◄
            ◄                                 ◄
              ┌─────────────────────────┐
              │ covariates xₛ: grouped  │
              │ age, sex, race, income, │
              │ education, general      │
              │ health                  │
              └─────────────────────────┘
```

poor health

downward bias