Econ 613 Reading Note #2
Peilin Wang

Since we know that governments are dedicated to reducing spending on medical care and keeping social welfare at the same time, the research focuses on an unfamiliar health insurance design: “top-up”. There already exist two commonly used insurance designs in high-income countries. The “full coverage” is typical in the U.S. that consumers can choose either treatment without paying the incremental cost. The “no top-up”, which only covers cost-effective treatments, has been used in countries like U.K. and Australia. Throughout analysis on the demand curve and logit regressions, authors have concluded that “top-up” can produce the ex-post efficient treatment decisions given the extent of risk exposure. But if risk exposures can be varied from ex-ante perspective, “full coverage” will generate high social welfare when risk exposure is high.

The paper analyzes health insurance policies from the treatment choices of breast cancer patients. The data used for the analysis include the distance between patients’ addresses and their nearest radiation treatment facility. It’s a combination of two datasets from California between 1997 and 2009. One is picked from the California Cancer Registry (CCR). Since government requires to report every cancer diagnosis from patients’ medical record, data from CCR is reliable and accurate. The reason for choosing the CCR database is that it includes not only demographic covariates but also patients’ addresses. The other is collected from the IMV. The dataset contains information about radiation treatment facility locations. The authors exclude individuals in datasets who are dead or are less than 20 years old and limit the sample only to patients who make choice between lumpectomy (L) and mastectomy (M) and have residence information.

To analyze welfare on the binary treatment choices, it is essential to have the demand curve for L relative to M. Since the demand curve is derived from the willingness to pay for L, we need to have the relative price of L to estimate it. However, there is no variation in the relative price of L. So, the authors assume that the distance between patients’ address and radiation facilities can be monetized. They use variation across distance and incremental price for L to construct a utility function. Before analyzing the utility function, the authors explore how distance influence treatment choices. It is apparent that patients who live further from a radiation facility are less likely to choose L. Even though a previous study has demonstrated that patients with different distances to radiation facilities will differ in characteristics, the relationship between treatment choice and travel time is not sensitive to patients’ characteristics. To get a quantified result, the authors construct logit regressions on the utility function and increase in travel time. The result shows that if the travel time increases 10 minutes, the patient will be less likely to choose L by about 0.7 to 1.1 percentage points. Since adding interaction terms make the estimate noisy, we can double confirm that the observable characteristics don’t have a significant effect on the relationship analysis.

Along with the logit regression on utility function, the authors can estimate the demand by using the cumulative distribution function of willingness to pay for L. The demand curves show that the welfare loss exists when choosing “full coverage” instead of “top-up” and the welfare gain exists when choosing “top-up” instead of “no top-up”. To be more detailed, without any controls, the “full coverage” raises the rate of L by about 37 percentage points associated with $2000 welfare cost, and the “no top-up” reduces the rate to almost zero while reducing welfare by about $1400 per patient. If controls are included, the changes will be more elastic for small price changes.

In addition to considering welfare taking risk exposure as given, this paper also further discusses ex-ante efficiency. The authors get the ex-ante utility function from maximizing the CARA utility function. Throughout the analysis, the result indicates that compared to “no top-up”, “full coverage” dominates for all levels of risk aversion. Moreover, if the risk aversion is low, “top-up” provides higher social welfare than “full coverage”, but it is lower if the risk aversion is high. So, “full coverage” has a higher social welfare ranking than “no top-up” and we cannot rank relative social welfare between “full coverage” and “top-up”. But if all else being equal, the social welfare ranking of “full coverage” will increase in risk aversion. Since “top-up” doesn’t dominate “full coverage” from the ex-ante perspective, the authors introduce “first best” policy. But it’s not a practical solution because it offers continuous coverage and adopts lump sum cash transfer as the payment method. Then, the authors mention a more practical policy: partial “top-up” coverage. It may generate adverse selection when the coverage for L is incomplete, but the adverse selection is not important in our analysis.

In conclusion, the main argument of this paper is that “top-up” produces the ex-post efficient treatment decisions, but it exposes the individual to ex-ante risk exposure. The analysis bases on the three health insurance policies, which are associated with the treatment choice between lumpectomy and mastectomy. Although this paper is well-organized, it may still have limitations. First, the datasets used in this paper are from a specific state in the U.S. They may cause bias. For example, people in California are more likely to have high incomes and to receive lumpectomy. Second, the authors use logit regressions to make analyses. But we don’t know if the results are statistically significant.