

Review on Einav et. al. 2016

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What private health insurance policy can generate the most social welfare? How can we design a more efficient health insurance market? In the current market, there are mainly two types of insurance policy: the “fully-covered US model” or the “no top-up” design that is used in the UK. The authors propose a “top up” policy that covers the cost-effective treatment but allows the insured to pay the price difference for a more expensive alternative. Using data on breast cancer treatment decisions and patient’s distance to the facility, the authors estimate the demand curve for lumpectomy, the more expensive treatment. Finally, they use the results to analyze how will “top up”, “no top up”, and “full coverage” system change the social welfare.

First, why a “top up” system should be more efficient? Suppose there are two treatments with similar outcomes but different costs, the full coverage model could prompt people to choose the more expensive treatment without internalizing any costs (the insurers pay for the extra costs). On the other hand, the “no top up” model would force most of the patients to choose the cheaper one despite some initially want to pay extra for the more expensive treatment. Hence, a “top up” model would be the ideal middle ground.

To empirically test this policy recommendation, the authors need to first estimate the demand for the treatments. Luckily, the authors obtain data on breast-cancer treatment decision in California with patients’ characteristics (California Cancer Registry, CCR). Studying breast cancer treatment comes with one important benefit: There are two dominant treatments with similar outcomes but different price. Additionally, the data contains patients address allowing the authors to capture the “price” for lumpectomy by using “distance to the radiation facility.” This is essential since patients are generally fully insured and did not pay for either treatment. Afterwards, the authors estimate the distance effect (the independent variable) on lumpectomy treatment (binary dependent variable) with standard logit models and random coefficient logit model.

For the standard logit models, they find that a 10-minute increase in travel time is associated with a decrease in the demand for lumpectomy by 0.7 to 1.1 percent. The coefficient is even more negative (2.5% decrease) when using the random coefficient method.

With the estimated coefficients and a monetized transformation for distance, the authors can derive the demand curve for lumpectomy and estimate welfare losses of the US and UK system. The US system greatly increases the share of people choosing lumpectomy in comparison to the efficient “top up” design, reducing the insurer’s welfare. On the contrary, the UK system will push the share of this expensive treatment to nearly zero, resulting in lower consumer surplus. Compared to the suggested policy, both US and UK systems create social welfare losses.

However, since the “top up” policy requires people to make top up decision in advance, it is essential to incorporate risk in the analysis. The basic argument is that: For individuals who value lumpectomy more than mastectomy, they face the risk of spending extra if there is no illness, or the risk of having to pay substantial amount for their preferred treatment if there is illness. The authors approach these risks by assuming CARA utility with homogeneous absolute risk aversion. Furthermore, by using the previous estimation of lumpectomy’s value distribution and treating probability of illness and risk aversion as constants, the authors can conduct the welfare analysis with consumer’s risk evaluation. Overall, they find that under the lowest value of risk aversion ($r = 0.0000026$), the top up system returns the highest social welfare. This result, however, will change if the risk aversion is higher. For $r = 0.0027$, the top up system inflicts a 74664 welfare loss compared to the full coverage system. That is, the ideal choice for insurance policy depends on people’s sensitivity to risk.

Overall, the authors make a strong case for the top-up policy by showcasing the potential welfare gain from it. Despite that the top-up system is clearly more efficient, the authors do concede that under high patient’s risk aversion the full coverage system may be more beneficial to the whole society.

For the paper’s limitation, I argue that using community level control for individual characteristics assumes homogeneous communities. Although I understand it is the best the authors can do, I expect new evidence to further verify their findings. Perhaps the more important problem is their simple analysis only considers patients and insurers. What if doctors with financial ties with medical companies and insurance companies can mislead the patients to top up the more expensive treatment? There could be more consumer loss in the top-up system than the US or UK system amid the deception. Since doctors’ link to medical companies are well documented, we can expect doctors to suggest the patients to pay extra for more treatment options. Additionally, the policy makers may have other priorities than maximizing the combination of patients and

insurer's utility. For example, the governor may prioritize less medical waste or less time waste on getting treatment for the patients. In that case, a UK system makes more sense and the gain from adopting a top-up system may not be that substantial. Moreover, should we use top-up system when the add-on treatment is statistically more effective? If we change from the full coverage US system to the top-up system, could ill-informed poorer citizens dominantly choose the basic package which will lead to health inequality? Nevertheless, the paper brilliantly links empirical results back to classic microeconomic welfare analysis, offering a careful and thorough analysis.