



Cancer Oncologic Drugs Between us Food and Drug Administration

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Abstract

Cancer drug prices are rising faster than the prices in other sectors of health care, drawing concern from patients, physicians, and policy researchers. We found little difference in the median wholesale price of 21 novel drugs and 30 next-in-class drugs approved over a 5-year period. Our results suggest that the price of cancer drugs is independent of novelty. Additionally, we found little difference in price among drugs approved based on time-to-event end points and drugs approved on the basis of RR. Our results suggest that current pricing models are not rational but simply reflect what the market will bear.

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significant in the case of prostate cancer. Our results imply that medical innovation between 1992 and 2010 could be associated with a reduction in the economic cost of a cancer diagnosis by about 13,500 and 5,800 dollars per patient and year in the case of prostate and breast cancer, respectively.

Discussion

When estimating separate effects by education, we find that the economic gains of medical innovation arise almost exclusively among patients with postsecondary education. These results are robust to various alternative specifications. We present a comprehensive discussion of our empirical findings. This study contributes to several distinct literatures [11]. First, and most important, we contribute to the small but growing literature on the labour market effects of medical innovation, which focuses on pharmaceutical innovation such as the birth control pill, HIV treatment, antidepressants and hormone replacement therapy, as well as minimally invasive surgery.

These studies use the introduction of a specific medical technology as a natural experiment. In contrast, we do not focus on one particular innovation but take a broader view on medical innovation and consider the labour market effects of cumulative medical innovation in cancer treatment over two decades as shown in (Figure 1). We also shed light on the value of medical innovation more generally [12]. Cutler show that increased medical spending is cost-effective in many cases. Murphy and Topel develop a general framework to evaluate the gains from medical innovations and find that the economic benefits of reducing mortality are very large. We contribute to this literature by considering the individual benefits that arise from medical innovation when cancer patients are able to stay economically more active after a diagnosis as shown in (Figure 2). Finally, we contribute to the literature on the nexus among health, education, and economic outcomes [13]. For example, Lundborg and Parro and Pohl show that the labour market effects of health shocks differ by education in Sweden and Chile. Heinesen and Kolodziejczyk find larger negative employment effects among less educated breast and colorectal cancer patients in Denmark. Glied and Lleras-Muney find that declines in mortality due to health-related technological progress are largest among highly educated individuals and Lleras-Muney and Lichtenberg show that patients with more education are more likely to use recently launched drugs. We add to this literature by studying how the interaction between medical innovation and education affects cancer patients' labour market outcomes. Treatment options for many types of cancer have vastly improved over the last few decades. The combination of surgery

and chemotherapy or radiation therapy is one of the major innovations that have lowered cancer mortality rates. Medical innovation has made cancer treatments more effective and reduced their side effects [14]. Zurrida and Veronesi describe important treatment innovations that happened during our sample period, such as breast-conserving surgery in the 1990s. Chemotherapy has become more effective in targeting cancer cells while causing less harm to healthy cells. New drugs that lower the risk of side effects of chemotherapy have also been developed.

The majority of new drugs, however, are approved for advanced-stage cancers and not for first-line therapy. Innovations in prostate cancer treatment include the use of hormonal therapy such as luteinizing hormone-releasing hormone analogues since the early 1980s; more recent drugs such as degarelix provide improved and cost-effective treatment options. Several innovations in surgical methods have also provided additional treatment options for prostate cancer. For example, laparoscopic radical prostatectomy is a minimally invasive surgical technique that leads to better postoperative functional outcomes [15].

These improvements in treatment of breast and prostate cancer are also reflected in the innovation measures that we use in our empirical analyses below.

Conclusion

Due to the significance of chemotherapy and hormone therapy in treating these cancers, drugs available for treatment of a specific type of cancer are an important measure of medical innovation. Lichtenberg provides a list of all drugs available for treatment by cancer type along with the year when they were approved in Canada.⁶ We use this information to calculate the cumulative number of drugs that were available for the treatment of breast and prostate cancer in the year of an individual's diagnosis.

Acknowledgement

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Conflict of Interest

None

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