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The impact of pharmaceutical innovation on health outcomes and utilization in Turkey: A re-examination

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Abstract

Previous research investigating the impact of pharmaceutical innovation in Turkey has shown that the use of newer drugs increased mean age at death by approximately 3 years during the period 1999-2008 and reduced the number of hospital days by approximately 1% per year during the period 2007-2010.

The present study assesses the contribution of pharmaceutical innovation to longevity and hospital use in Turkey during a more recent period (2009-2013), using different longevity measures, and with a different data set. The IMS Health Turkey Medical Prescription Index, which provides detailed diagnosis and treatment profiles of patients treated in outpatient clinics, is used. This enables us to use annual data during the period 2009-2013 on the drugs prescribed by doctors for the treatment of 19 medical conditions to measure pharmaceutical innovation.

Our findings indicate that new technology continued to have a favorable impact on potential years of life lost before age 70, the age-standardized mortality rate, and hospitalization during the period 2009-2013. Pharmaceutical innovation (i.e., the use of newer molecules) decreased premature deaths by 2.2%, the age-adjusted mortality rate by 3.6%, and hospitalization by 7.3%.

Turkish healthcare policy-makers should consider the broader outcomes of restrictions on access to new medicines.

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Introduction

Health care reforms have been on the agenda of Turkish policy-makers for more than a decade. The debate around the reforms has moved from making new changes in the financing and provision of services to measuring the outcomes and investigating the results of cost-containment measures. Concerns about sustaining the reforms and using scarce resources more efficiently and effectively have resulted in using health technology assessment (HTA) as a policy tool for controlling the diffusion of new technology within the health care system. Although attempts have been made to extend the coverage of HTA to medical devices, HTA has been used mainly for pharmaceuticals as a fourth hurdle to overcome during the market access process.

The debate about the contribution of healthcare services and technology to improvements in life expectancy has not been adjourned yet. Historically, there is a powerful group advocating socioeconomic developments, life style and environmental factors as the main drivers of increases in life expectancy. However, there is also a growing literature on the impact of health care services and new technology on life expectancy [3,7,9,10,16]. Pharmaceutical innovation is an important component of the health system contributing to improvements in health status, but there are other factors as well.

Biomedical innovation can contribute to healthcare outcomes in several ways, and this contribution is classified as substitution effect of treatment and treatment expansion effect [3]. Substitution effect connotes the replacement of old therapies by new ones. Treatment expansion effect, on the other hand, refers to innovative treatments making diseases that cannot be treated previously treatable. A potential outcome for both of them is increased healthcare expenditures leading to discussions and policies to curb them. However, the increase in healthcare expenditures caused by new technologies may be offset by decreases in other components of health expenditure as the new technology may reduce hospitalization and nursing home utilization, need for surgical interventions, etc.

Pharmaceuticals are the most important components of health technology and contribute to the health and wellbeing of the population in diagnosis, prevention and treatment of a wide range of health conditions. Development of a new molecule is a high-cost endeavor containing high risks and also requiring a long time from the invention of the molecule to its use. The cost of the innovation is shared by healthcare systems using the product until its patent expiration and this is one potential underlying factor in rising healthcare expenditures. However, new drugs can also offset their impact on health budgets by (i) shortening treatment duration, (ii) increasing effectiveness and (iii) decreasing hospital costs by decreasing the number of admissions and/or average length of stay in hospitals. These outcomes may both affect the health status of patients positively and offset the increase in pharmaceutical expenditures [6]. A number of studies have aimed at showing the relationship with technological development and healthcare expenditures and concluded that new technology can both improve outcomes and also offset the increase in costs through savings in other parts of the healthcare system [1,2,4,5,7,8,11,15]. This effect was

analyzed for impact of cardiovascular drugs on hospitalization and it was concluded that if the drug vintage had not increased during 1995-2004, hospitalization and mortality from cardiovascular diseases would have been higher in 2004 [11]. Also, Lichtenberg [12] estimated that 87% of the increase in pharmaceutical expenditure in France attributable to pharmaceutical innovation was offset by a reduction in hospital expenditure. In the United States, more than 100% of the increase in pharmaceutical expenditure attributable to pharmaceutical innovation was offset by a reduction in hospital expenditure [13].

Turkey's health care system has been subject to a radical reform process since 2003, and major changes have been achieved both in the provision and financing sides. These changes had an impact on pricing and reimbursement policies of pharmaceuticals, which in the end affected the entry of innovative products into the Turkish health care system. The impact of these policies on longevity, hospital utilization and health expenditures have been elaborated upon in previous research [14]. The study aimed at estimating the effects of pharmaceutical innovation on mortality in Turkey during the period 1999-2008, and hospitalization and health expenditures during the period 2007-2010. The study briefly investigated whether the diseases that experienced more pharmaceutical innovation had larger increases in longevity and smaller increases in hospitalization by using longitudinal disease-level data to estimate difference-in-differences models. The results showed that during the study period, mean age at death increased by approximately 3 years, from 63.6 to 66.6. The estimates implied that in the absence of any increase in drug vintage, mean age at death would have increased by only 0.6 years.

According to the study, the number of hospital days increased 22% during the period 2007-2010. The estimates indicated that in the absence of pharmaceutical innovation, the number of hospital days would have increased by 25% during this period. Hence, 3 years of pharmaceutical innovation reduced the number of hospital days in 2010 by approximately 3%. Pharmaceutical innovation reduced the number of hospital days by approximately 1% per year.

These results, showing that pharmaceutical innovation has increased longevity and reduced hospitalization in Turkey, were in line with findings from a number of other countries. The study also separately analyzed the entry of new molecules to the Turkish market in comparison with the USA and European markets. FDA and EMA data showing the entry of new molecules to the market were compared with the Turkish entries between 2012-2013 and 2005-2013 (Tables 1 and 2).

As the tables show, the entry of new molecules to the Turkish market compared to the USA and Europe has slowed down over the years. The restrictions and new regulations in market approval, pricing and reimbursement are among the main drivers of this trend. Although the FDA approved 36 molecules and the EMA approved 22 molecules during the period between 2012-2013 Q2, only two molecules were approved in Turkey (4% of FDA and EMA approvals). In the period between 2005 and 2013 Q2, 36% of the molecules approved both by the FDA and EMA were approved in Turkey. The previous study drew the attention of the policy makers to the contribution of pharmaceuticals to longevity, hospital

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