

# The Overall Impact Of New Drugs

*Living better, longer...*

**Frank R. Lichtenberg**

Many economists believe new goods are at the heart of economic progress and that innovative goods are better than older products because they provide more “product services” in relation to their cost of production. The pharmaceutical industry has among the highest propensities to generate new goods; it is one of the most R&D-intensive industries in the economy.

In part because of extensive Food and Drug Administration regulation, there is unusually good data about the launch and diffusion of new pharmaceutical goods. I have used these data to perform a number of econometric studies at the individual, disease and country level, in order to assess the health and economic impacts of the development and use of new drugs. These studies are based on data covering all medical conditions and all drugs and provide evidence about the health and economic impacts of new drugs in general, not about specific drugs or their impacts on particular diseases.

In a forthcoming study in *International Journal of Health Care Finance and Economics*, I found evidence that new drug launches have added greatly to longevity in the last two decades in 52 nations, both developed and developing. Over the past half century, life expectancy around the world has increased sizeably, from an average of 46.5 years for a child born in 1950-55 to an average of 65 years for a child born in 1995-2000. The gap in life expectancy between rich and poor countries has been halved, from 25 to 12 years. Sorting out the causes for longevity improvements, however, has proved difficult. Many health researchers have primarily credited more education, higher income, better lifestyle and a safer environment for increased longevity.

By combining data from the IMS Health Drug Launches database and the World Health Organization Mortality database, I was able to link the number of new drugs with changes in the probability of surviving to certain ages for each major disease category, country, and year. When the stock of drugs is measured with a lag of three to six years, the effect on longevity is more than twice as large as in the first three years. This suggests it may take several years for a new drug to be diffused to more consumers and have its full impact on survival rates.

New drug launches account for a substantial fraction of medical innovations. Of the two years added to the average lifespan between 1986 and 2000, I calculated that about 40% can be traced to the introduction of new drugs. On average, the introduction of new drugs lengthened the life of people in these 52 countries by just short of three weeks each year.

Another forthcoming study in *Journal of Occupational and Environmental Medicine* examined the impact of the introduction of new drugs during a 15-year period on changes in the ability of non-elderly adult Americans to work. Several previous case studies have examined the impact of specific new drugs on ability to work. For example, one study found that terbutaline, an asthma drug approved by the FDA in 1974, reduced the number of work or school days missed due to asthma by 57%.

These case studies were based on relatively small samples of individuals with the same condition at the same time, and it is difficult to estimate from them the average or aggregate effect of new drugs on ability to work. I used a different approach. My analysis was based on data on about 200,000 Americans with 47 major chronic conditions observed throughout the period 1982-96. I investigated whether people with conditions for which many new drugs were introduced exhibited greater increases in ability to work than people with conditions for which few new drugs were introduced, controlling for other factors.

The study found that if the probability of being unable to work had not been reduced by new drug introductions during 1982-96, this probability would have been 29% higher in 1996 than it actually was — 5.2% instead of 4%. In 1996, the per capita annual value of the estimated reduction in the probability of being unable to work at all was about \$395, while the average expenditure on new drugs per working-age person was \$51. The estimated benefit of the new drugs, in terms of the value of the increase in workforce participation, is thus much greater than the estimated cost of the new drugs.

This confirms that people may obtain several kinds of benefits from using newer, as opposed to older, pharmaceutical products. These include longer life, reduced limitations on activities (including work), and reduced expenditure on hospitals and long-term care.

**Frank Lichtenberg** is the Courtney C. Brown Professor at Columbia University Graduate School of Business. Before joining Columbia, Prof. Lichtenberg taught at Harvard University and at the University of Pennsylvania. He is also a Research Associate of the National Bureau of Economic Research, and has served as a consultant to the Institute of Medicine. Prof. Lichtenberg has won several awards, including the 2003 Milken Institute Award for Distinguished Economic Research for his paper, "Pharmaceutical Knowledge-Capital Accumulation and Longevity."

Dr. Lichtenberg's work is both up to date and well-known when it comes to showing the value and positive economic impact of new drugs. He is one of the most eloquent defenders of pharmaceutical research companies.

---

From the Montreal Economic Institute (MEI) Web site. Montreal, April 7, 2005.