Medicines Australia

Better health through research & innovation

Pharmaceutical Innovation Improves Patient Outcomes and Reduces Hospital Demand

Measuring the Impact of Pharmaceutical Innovation in Australia 1998–2018

Research by Professor Frank R. Lichtenberg

Professor Frank R. Lichtenberg is Courtney C. Brown Professor of Business at the Columbia University Graduate School of Business; a Research Associate of the National Bureau of Economic Research; and a member of the CESifo Research Network. He received a BA with Honors in History from the University of Chicago and an MA and PhD in Economics from the University of Pennsylvania.

Pharmaceutical Innovation Reduces Hospital Demand, Is Cost-Effective and Most Importantly Improves Patient Outcomes

The Impact Of Pharmaceutical Innovation On Premature Mortality And Hospitalization In Australia, 1998-2018 by Professor Frank R. Lichtenberg analyses the outcomes of pharmaceutical innovation on premature mortality, hospital utilisation, and cancer patient outcomes up to 2018.

Prof. Lichtenberg carried out analysis on all diseases to understand the impact the number of drugs available on the PBS had on premature mortality (the death of an individual before the age of 90). Years of potential life lost (YPLL) reflects the number of years not lived by an individual before a certain age and is a common measure of premature mortality.

In Australia between 1998 and 2015 the premature mortality rate for all diseases fell by 22.6% and of that, 94.8 percent can be attributed to pharmaceuticals

Prof. Lichtenberg's research is strong evidence that the development and use of these new medicines contribute to long-term economic growth in Australia and are an important investment in Australia.

Key Findings

- Pharmaceutical innovation is responsible for almost all (94.8%) of the decline in premature (pre-age 90) mortality between 1998 and 2015, and about half of the increase in the average age at death from cancer between 2008 and 2018.
- New medicines launched between 1986 and 2000 were estimated to be responsible for a 7.3% (1.71 million days) reduction in hospital days in the year 2015.
- The overall cost per life-year gained before age 90 would not have exceeded $5900 AUD.
- The effect of pharmaceutical innovation on hospital utilisation, in the long run, was cost saving as well as life-year saving.

Impact Of Premature Mortality

Premature mortality declined by 22.6% between 1998 and 2015, and around 94.8% of that can be attributed to pharmaceutical innovation.

1998-2015 decline in premature mortality per 100,000 population:

	Actual Decline	Percentage of actual decline due to pharmaceutical innovation
Before Age 80	24.7%	56.7%
Before Age 85	24.2%	77.3%
Before Age 90	22.6%	94.8%

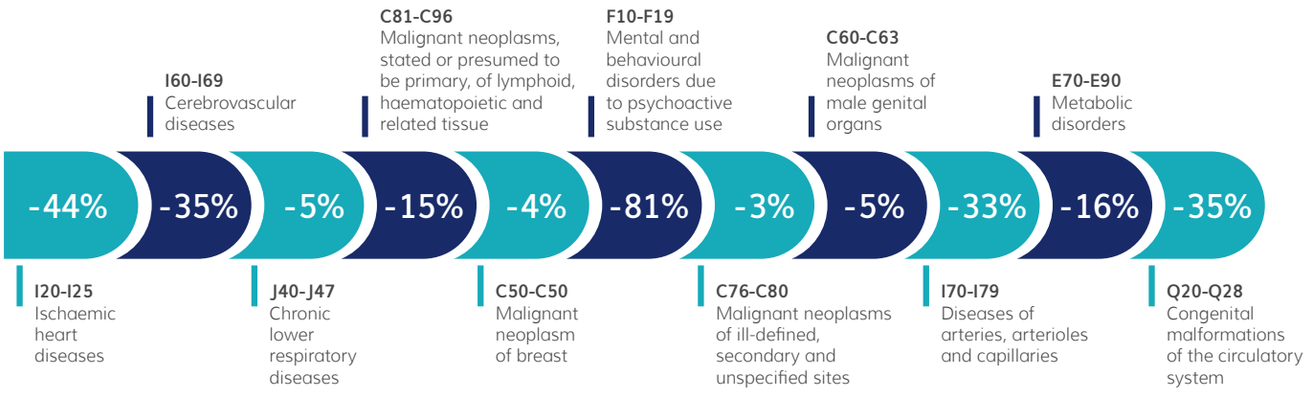
Innovative medicines saved over 586,714 years of life before the age of 90 in Australia in 2015.

It takes 14 years to reach maximum utilisation of a new medicine. Using 2015 as a base year, medicines launched between 1987 and 2003 reduced Years Life Lost (YLL) in 2015 by:

Before Age 80	194,905 years
Before Age 85	370,891 years
Before Age 90	586,714 years

Actual years life lost in 2015 was 2.16 million. This would have been 2.74 million (27.2% higher) without any new medicines launched during 1987-2003.

The Top 10 Disease Areas With Large Mortality Rates and Improvements Over Time



Impact On Cancer

Professor Lichtenberg found a 44% of the increase in the survival rate for cancer patients from 2001–2005 to 2011-2015 was due to the launch of new cancer drugs. The launch of these new cancer drugs was also responsible for almost half (48%) of the 2008 to 2018 increase in mean age at death from cancer.

Impact On Hospitals

The new medicines which were launched in Australia between 1986 and 2000 reduced the number of hospital days in 2015 by 7.3%.

Even if we ignore the effect of new drugs on hospital utilisation, the drugs launched during 1987 and 2003 were very cost effective, overall; the cost per life-year gained before age 90 would not have exceeded about $5900 AUD. When the effect of new drugs on hospital utilisation is taken into account, the evidence indicates that in the long run pharmaceutical innovation was cost saving as well as life-year saving.

Hospital Days

- Number of Hospital days in 2015 = 23.3 million.
- Number of Hospital days without any new drugs launched (1986-2000) = 25 million.
- This is 7.3% higher.

Policy Recommendations

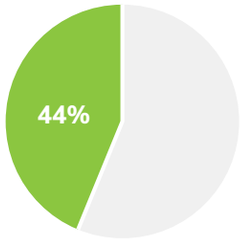
Cost effectiveness of health interventions is one measure of the broader outcomes delivered from Government investment. This could provide additional information on where investments deliver the greatest outcomes for society which would support funding decisions for breakthrough medicines.

Outcomes from Professor Lichtenberg's research reinforce the need for discussions about the environment for new medicines in Australia. A more sophisticated health evaluation system which quantifies in dollar terms the benefits and costs of improved health outcomes as a result of an increase in medicines listed on the PBS would lead to better, more transparent policy decisions, and would demonstrate the true net cost/value of the PBS.

Cancer Drug Facts

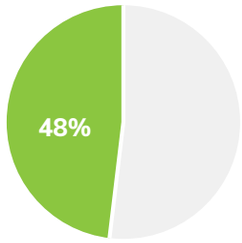
The report estimates that new cancer drugs launched during 2004 and 2013 reduced the number of years of life lost for each age group:

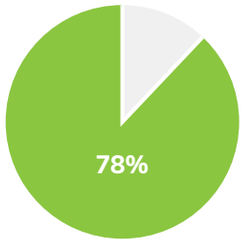
Age 65	14.4%
Age 75	13.0%
Age 85	11.4%



44% of the increase in the five-year cancer survival rate between 2001-2005 (62.1%) and 2011-2015 (68.9%) was due to the launch of new cancer medicines

Almost half (48%) of the 2009-2018 increase (1.06 years) in mean age at death from cancer was due to the launch of new cancer drugs.





Cancer drugs launched during 1998-2008 reduced the number of cancer deaths in 2018 by 7.8%.

Acknowledgements

Support for this research was provided by Medicines Australia, MSD Australia, Roche Australia, Janssen Australia, and Sanofi.