



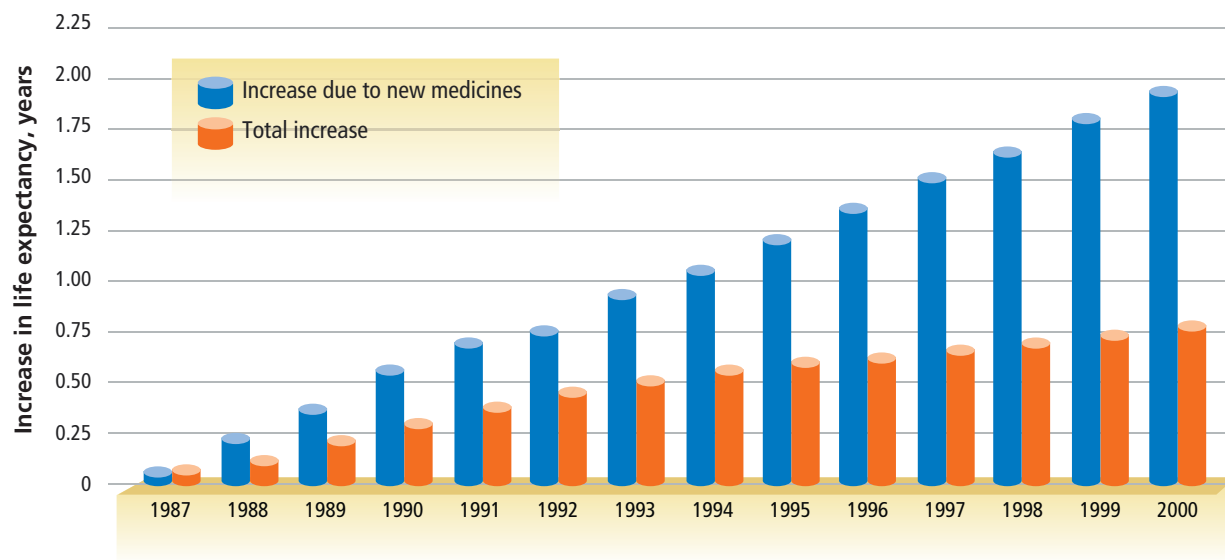
## Pharmaceutical Innovations to Address Chronic Diseases

The R&D-based pharmaceutical industry recognizes the increasing burden that Non-Communicable Diseases (NCDs) place on patients and health systems around the world. In the fight to improve the health and quality of life of all patients, the pharmaceutical industry is committed to continuing partnerships to tackle these complex issues including extensive investment in R&D programs dedicated to the development of new NCD preventative and treatment products. Both prevention and treatment play an important role in increasing our ability to tackle NCDs.

The burden of disease attributed to NCDs worldwide is 85% in industrialized nations, 70% in middle-income and nearly 50% in low-income nations.<sup>i</sup> In fact, in 2005, chronic diseases accounted for 60% of all deaths worldwide.<sup>ii</sup> Prevention through controlling risk factors coupled with interventions to address those with chronic disease or at a high risk of developing chronic disease can lead to significant decreases in the cost and burden of disease to a society.<sup>iii</sup>

Figure 1

### Increase in Life Expectancy



SOURCE: Lichtenberg FR (2005), "The impact of new drug launches on longevity: evidence from longitudinal, disease-level data from 52 countries, 1982-2001." *Int J Health Care Finance Econ.* 5:47-73.

**Lives Saved**

In addition to cost savings, the innovation of the pharmaceutical industry has saved lives. In fact, between 1986 and 2000, a study of 52 countries showed an increase in life expectancy, and 40%–59% of the increases were due to the introduction of innovative medicines.<sup>vii</sup>

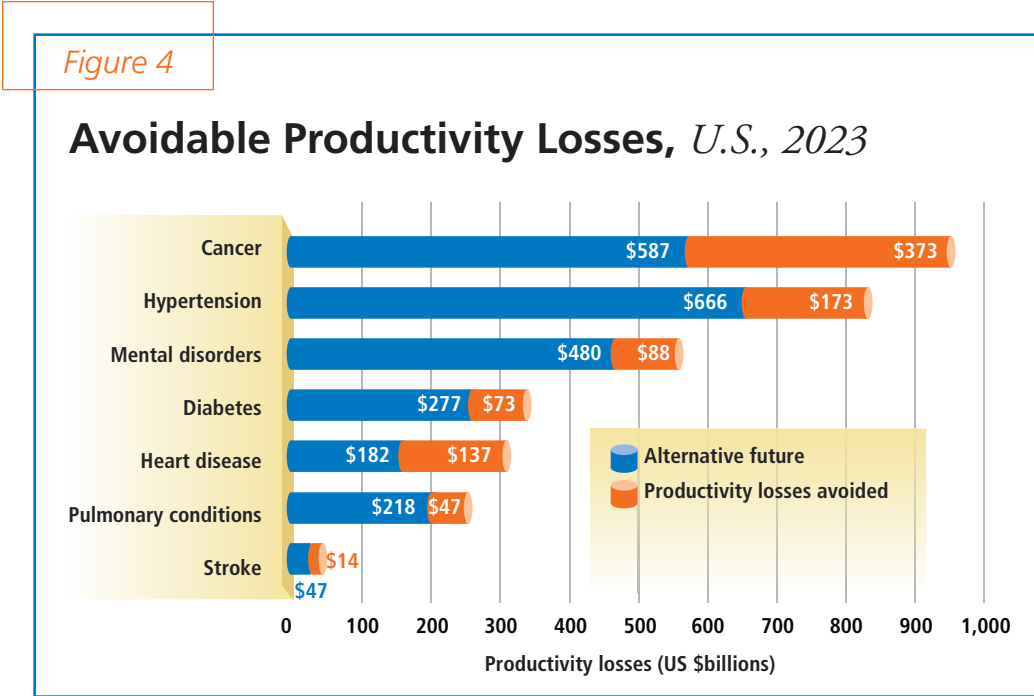
Interventions and appropriate use of medicines have resulted in declining rates of death and heart failure resulting from cardiovascular disease. Figure 2 illustrates the 45% decline that has occurred in 14 countries from heart attack deaths and heart failure from 1999 to 2005.

**Improvement of Health**

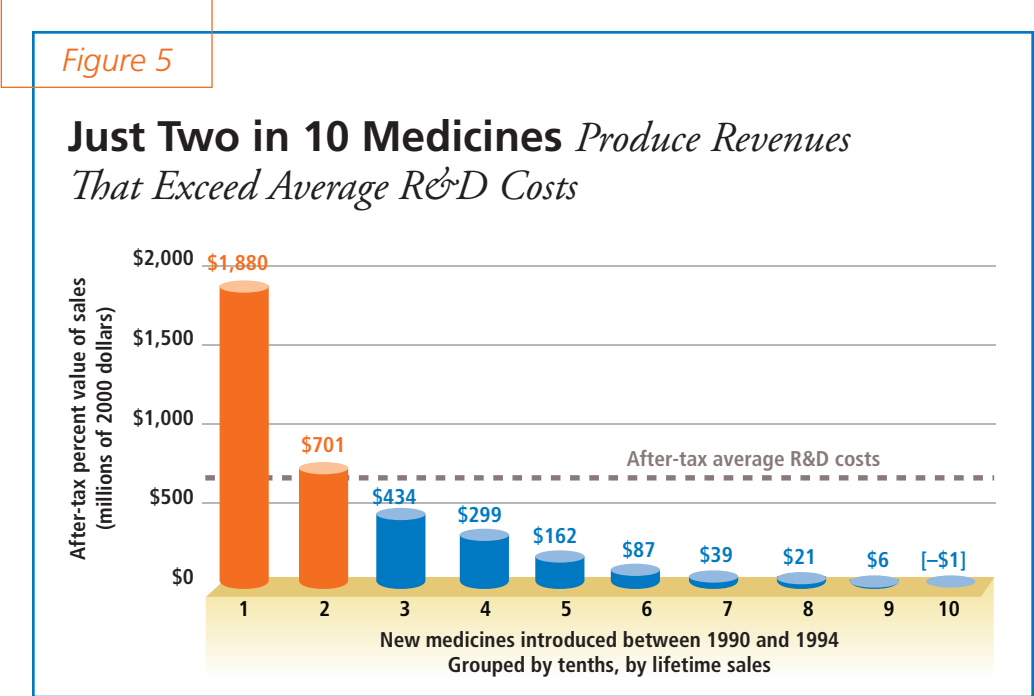
Proper adherence to a medication regimen will greatly improve health outcomes, which is seen through decreased hospitalization and avoidance of premature deaths. Figure 3 indicates how properly taking recommended medicines saves lives and improves health.

**Productivity Saved**

Proper management of chronic diseases not only leads to healthier lives and tangible cost savings, it also leads to indirect cost-savings, such as less lost productivity. Figure 4 shows avoidable productivity losses in the United States in 2023 if chronic diseases were better controlled.



SOURCE: Milken Institute, “An Unhealthy America: The Economic Burden of Chronic Disease, Lessons for China,” November 22, 2009, slide 16.



SOURCE: J.A. Vernon, J.H. Golc and J.A. DiMasi, “Drug Development Costs When Financial Risk Is Measured Using the Fama-French Three-Factor Model,” *Health Economics Letters* (2009).

### Role of Pharmaceutical Industry

The pharmaceutical industry recognizes its role in combating NCDs worldwide with appropriate interventions. Research and development have made interventions available to address chronic diseases through drug therapies that effectively and safely treat chronic diseases. In addition to creating new therapies, the pharmaceutical industry understands that they should:

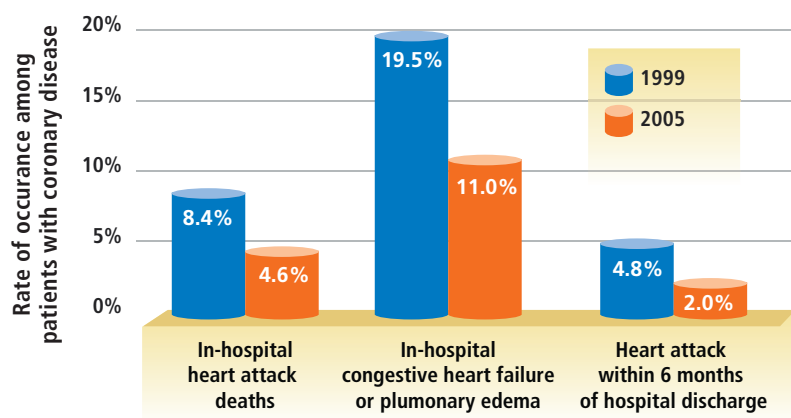
- Help developing countries to have access to NCD treatments and medicines
- Form partnerships with national leadership to create solutions for the problem of NCDs
- Promote workplace wellness programs to improve the health of employees

### Savings from Research and Development Cost Savings

The World Bank recognizes that in addition to prevention, effective use of pharmaceuticals is the most cost-effective means to control symptoms of chronic diseases.<sup>v</sup> Adherence to pharmaceuticals has shown to dramatically lower cost savings spent on other health care services. For instance, in a recent study published in *Health Affairs*, congestive heart failure patients spent an additional \$1,058 per year on medicines but lowered their medical spending on hospitalizations or emergency department use by \$8,881 for a total savings of \$7,823. Diabetic patients who adhere to their medication regimen saved \$4,413 per year.<sup>vi</sup>

Figure 2

### Adverse Events Among Patients with Coronary Disease in a Study of 14 Countries



SOURCE: K.A. Fox, et al., "Decline in Rates of Death and Heart Failure in Acute Coronary Syndromes, 1999-2006," *Journal of the American Medical Association* 297, no. 17 (2007): 1892-2000.

Figure 3

### Annual Hospitalizations and Deaths Avoided Through Use of Recommended Antihypertensive Medications

	Actual hospitalizations avoided	Annual premature deaths avoided
<b>Actual prevention:</b> Based on current treatment rates	833,000	86,000
<b>Potential additional prevention:</b> If untreated patients received recommended medicines	420,000	89,000

SOURCE: D.M. Cutler, et al., "The Value of Hypertensive Drugs: A Perspective on Medical Innovation," *Health Affairs*, 2007.

### Innovation of Pharmaceutical Industry

The pharmaceutical industry recognizes the burden that chronic diseases and NCDs are creating worldwide and has numerous research and development efforts underway to address this problem. In 2009, there were more than 6,700 compounds in development worldwide.<sup>viii</sup> Billions of dollars are invested in research and development each year because only one of every 5,000–10,000 compounds makes it to market.<sup>ix</sup> In the United States alone, pharmaceutical companies spent \$65.3 billion on research and development in 2009. This does not include the \$30.6 billion spent by the National Institutes of Health in the same year.<sup>x</sup> Because few approved medicines are commercially successful, the ones that are must recoup the dollars spent on those that are not commercially successful in addition to those that never make it to market. If these commercially successful medicines do not recoup the overall dollars spent, the resources will not exist for continued research and development, especially for the drugs needed to combat NCDs on a global scale.<sup>xi</sup>

### End Notes

- <sup>i</sup> Lopez, Alan; *Global Burden of Disease and Risk Factors*; World Bank, 2006, pg. 89
- <sup>ii</sup> World Health Organization; *Preventing Chronic Diseases a Vital Investment*; World Health Organization Cataloguing-in-Publication Data, 2005, pg. 2
- <sup>iii</sup> World Health Organization; *Preventing Chronic Diseases a Vital Investment*; World Health Organization Cataloguing-in-Publication Data, 2005, pg. 90
- <sup>iv</sup> IFPMA NCD Flyer Text, Text Box 3
- <sup>v</sup> Center for Science in Public Policy, Hudson Institute; *The Macroeconomic Consequences of Chronic Diseases in Emerging Market Economies: Phase II*; January 2011, pg. 17
- <sup>vi</sup> Center for Science in Public Policy, Hudson Institute; *The Macroeconomic Consequences of Chronic Diseases in Emerging Market Economies: Phase II*; January 2011, pg. 17–18
- <sup>vii</sup> Lichtenberg FR (2005) The impact of new drug launches on longevity: evidence from longitudinal, disease-level data from 52 countries, 1982-2001. *Int J Health Care Finance Econ.* 5:47-73
- <sup>viii</sup> Adis R&D Insight Database, Wolters Kluwer Health, customized runs, February 2009 and January 2010
- <sup>ix</sup> Pharmaceutical Research and Manufacturers of America, Drug Discovery and Development: Understanding the R&D Process, [www.innovation.org](http://www.innovation.org)
- <sup>x</sup> Burrill & Company, Analysis for PhRMA, 2005–2010 (includes Phrma Research Associates and Nonmembers) in PhRMA, “Profile 2010, Pharmaceutical Industry;” Pharmaceutical Research and Manufacturers of America, PhRMA Annual Membership Survey (Washington, DC: PhRMA, 1996–2010); National Institute of Health Office of Budget, “History of Congressional Appropriations,” <http://officeofbudget.od.nih.gov/pdfs/fy08/fy08%20CompleteD/appic3806%20-%20transposed%20%2090%20-%2099.pdf> (for 1995-1999), [http://officeofbudget.od.nih.gov/pdfs/fy11/approp%20history%20by%20iC%20\(final\).pdf](http://officeofbudget.od.nih.gov/pdfs/fy11/approp%20history%20by%20iC%20(final).pdf) (for 2000- 2009) [access March 2011]
- <sup>xi</sup> J.A. Vernon, J.H. Golc and J.A. DiMasi, “Drug Development Costs When Financial Risk Is Measured Using the Fama-French Three-Factor Model,” *Health Economics Letters* (2009): Drug development costs represent after-tax out-of-pocket costs in 2000 dollars for drugs introduced from 1990-94. The same analysis found that the total cost of developing a new drug was \$1.3 billion in 2006. Average R&D costs include the cost of approved medicines as well as those that fail to reach approval