

# THE VALUE OF Drug Adherence

It is well established that medicine can have a positive impact on people's health. We see it clearly in the fast recovery of an acutely ill patient with a bacterial infection on an antibiotic, and we see it with the reduction of cardiovascular diseases due to the introduction of anti-hypertensive and anti-cholesterol medications over the past few decades.<sup>1</sup> Optimal management and control of an illness, however, generally requires that the prescribed drug regimen be well followed by the patient. Drug adherence is defined as the extent to which a patient takes his or her medication as prescribed. The value of drug adherence can be seen in the unnecessary costs that are often incurred, and the opportunities to advance public health that are lost, when medicines are not taken for their full prescribed course.

While many dollars are spent on patient care, the desired outcomes are not always achieved; one reason for this is poor drug adherence. According to one report, an estimated third to one-half of all patients in the U.S. do not take their medications as prescribed by their doctors.<sup>2</sup> Poor drug adherence can adversely affect the trajectory of a disease, and the increase in medical services necessary to ameliorate those effects can be costly. This is problematic, as poor adherence leads to both sub-optimal clinical benefits for patients as well as an inefficient use of health care resources. Due to many factors and complexities underlying poor drug adherence, interventions to increase patient drug adherence have proven a challenge. Nonetheless, there are clear opportunities to improve clinical outcomes for patients, and gain a positive economic impact through health care savings, with improved drug adherence. A number of research studies have been conducted to examine the health and economic impact of drug adherence, some of which are highlighted below.

## Value Statistics Associated with Drug Adherence

- Reductions in hospitalizations and emergency department visits are key drivers of declining health costs associated with improved medication adherence.<sup>3</sup>
- Using integrated pharmacy and medical administrative claims data on American individuals who had continuous health insurance coverage from 2005 to 2008, one study<sup>3</sup> indicated that across four major conditions (congestive heart failure, hypertension, diabetes, and dyslipidemia) adherence was associated with significantly lower annual inpatient hospital days, ranging from 1.18 fewer days for dyslipidemia to 5.72 fewer days for congestive heart failure.
- An analysis<sup>4</sup> conducted for five chronic diseases using data compiled in the U.K., Germany, and the Netherlands showed direct productivity benefits from improved adherence. These diseases (hypertension, asthma/ chronic obstructive pulmonary disease (COPD), chronic back pain, depression, and rheumatoid arthritis) were responsible for driving huge annual productivity losses, reaching €28 to €50 billion in the U.K., €38 to €75 billion in Germany, and €9 to €13 billion in the Netherlands.

## KEY TAKEAWAYS

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The U.S.'s Congressional Budget Office (CBO) estimates that a 1 percent increase in the number of prescriptions filled by beneficiaries would reduce Medicare's spending on medical services by roughly 0.2 percent.<sup>8</sup>

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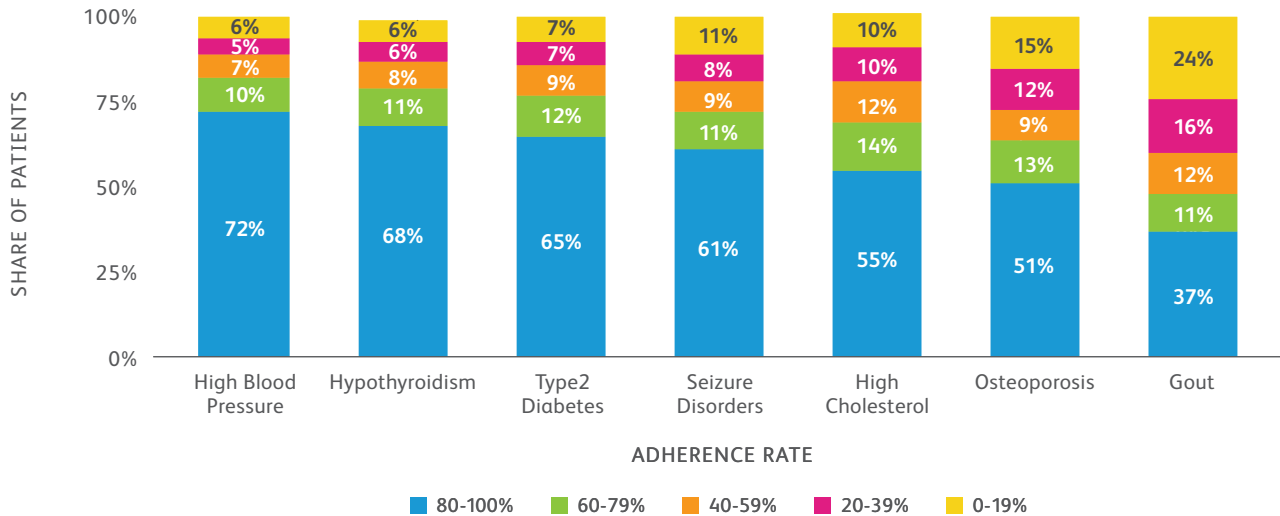
\$1 more spent on diabetes medicines equals \$7.10 less spent on other services.<sup>15</sup>

- In the U.S., the link between use of prescription medicines and spending on other health care services has been acknowledged by the U.S.'s nonpartisan Congressional Budget Office (CBO). In 2012, the CBO announced a change to its scoring methodology to reflect savings in medical spending associated with policies that increased use of medicines in Medicare.<sup>5</sup> The CBO estimates that a 1 percent increase in the number of prescriptions filled by beneficiaries would cause Medicare's spending on medical services to fall by roughly one-fifth of 1 percent.<sup>6</sup>
- Payers recognize the cost-offset value of drug adherence as more plans implement a variety of adherence management strategies. According to a recent survey of over 102 U.S. health plans representing over 106 million lives, approximately 70 percent of plans consider adherence management among their most valuable services.<sup>7</sup>

## Social Health and Potential Economic Impact on Specific Diseases

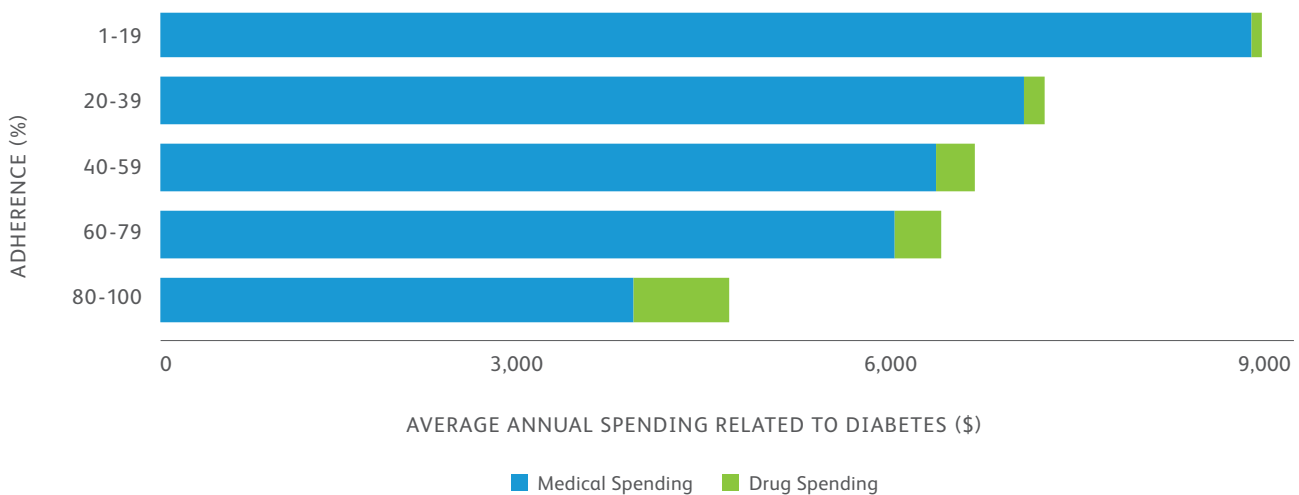
- **High Blood Pressure:** Using population life tables and cause-of-death statistics from the U.S.'s National Center for Health Statistics (NCHS), one study<sup>8</sup> translated these risks into changes in life expectancy and found that if all patients with stage 1 or 2 hypertension who reported being untreated had been treated in accordance with clinical guidelines, and if all treated patients achieved normal blood pressure, an additional 89,000 fewer premature deaths from major cardiovascular disease would have occurred in 2001.
- **High Cholesterol:** Using combined population and clinical data, one study<sup>9</sup> calculated anti-cholesterol (statin) drug therapy's social value to consumers for the period of 1987 to 2008. Survey data from the National Health and Nutrition Examination Study (NHANES) (a repeated survey of the health status of the U.S. civilian, noninstitutionalized population) suggested that statin therapy reduced low-density lipoprotein by roughly 19 percent, which translated into roughly 40,000 fewer deaths, 60,000 fewer heart attacks, and 22,000 fewer strokes in 2008.
- **Heart Failure:** Using a simulation model that quantified the impact of Part D on adherence and medical expenditures for Medicare beneficiaries, a recent study<sup>10</sup> published in the American Journal of Managed Care, showed that improved adherence to medication following the expansion of drug coverage under Medicare Part D in the U.S. led to nearly \$2.6 billion in savings to medical expenditures annually among beneficiaries with congestive heart failure. The study, also found that improving adherence to recommended levels could save Medicare another \$1.9 billion annually, leading to \$22.4 billion over 10 years.
- **Diabetes:** A study conducted in 2012<sup>11</sup> using data extracted from a large US managed-care company that provides pharmacy management services to a range of clients including employers and health plans, found that improved adherence to diabetes medications was associated with 13 percent lower odds of subsequent hospitalizations or emergency department visits. Based on these and other effects, the study authors projected that improved adherence to diabetes medication could avert 699,000 emergency department visits and 341,000 hospitalizations annually, for a saving of \$4.7 billion.
- **Osteoporosis:** Adherence to osteoporosis medicines have been shown to greatly reduce medical costs, especially hospitalization and long-term care costs. A study<sup>12</sup> conducted in 2007 used a validated model of osteoporosis, populated with epidemiologic and cost data to estimate the total number of incident fractures and associated costs for the U.S. population 50 years of age and above from 2005 through 2025. By 2025, annual fractures and costs were projected to grow by 50 percent and will surpass 3 million and \$25 billion, respectively. Using data collected from 45 employers and 100 health plans in the continental U.S. from two claims databases during a five-year period (1999–2003) another study<sup>13</sup> found that patients who were refill compliant and persistent showed 20–45% relative-risk reductions in fractures.
- **Rheumatoid Arthritis:** Researchers at the *Integrated Benefits Institute* found that a decrease in rheumatoid arthritis medicines led to increased incidence and longer duration of short-term disability leave. Researchers estimated that when workers with arthritis take their medication as directed, their lost productivity drops by 26 percent.<sup>14</sup>

### Patient Adherence Rates by Chronic Conditions



Adapted from: BA Briesacher et al. (2008). Comparison of Drug Adherence Rates Among Patients with Seven Different Medical Conditions. *Pharmacotherapy* 28(4):437-43

### Return on Investment from Improved Medication Adherence: Diabetes



Adapted from: M. Sokol et al., (2005) "Impact of Medication Adherence on Hospitalization Risk and Healthcare Cost," *Journal of Medical Care* 43 (6).  
 Notes: Adherence is the extent to which patients take medicines as prescribed, in terms of dose and duration. Return on Investment estimates reflect spending attributable to the condition listed.

## Endnotes

- 1 Arca, Marcella et al. (2007). Atorvastatin Efficacy in the Primary and Secondary Prevention of Cardiovascular Events. *Drugs*, 67, Suppl. 1 (29-42).
- 2 New England Healthcare Institute. (2009). Thinking Outside the Pillbox: A System-Wide Approach to Improving Patient Medication Adherence for Chronic Disease.
- 3 M. Christopher Roebuck, et al.(2011). Medication Adherence Leads to Lower Health Care Use And Costs Despite Increased Drug Spending. *Health Affairs* 30, No.1, 91-99.
- 4 Peter Behner, et al. Unleashing the Potential of Therapy Adherence. *High-Leverage Changes in Patient Behavior for Improved Health and Productivity*. Booz & Co. | Bertelsmann Stiftung.
- 5 Proper Use of Medication Can Significantly Reduce Health Care Costs. Retrieved from [www.phrma.org/value/healthcare-costs](http://www.phrma.org/value/healthcare-costs) (April, 2013).
- 6 Congressional Budget Office. November 2012. Offsetting Effects of Prescription Drug Use on Medicare's Spending for Medical Services.
- 7 EMD Serono Specialty Digest™ 9th Edition. Managed Care Strategies for Specialty Pharmaceuticals.
- 8 Cutler DM, et al. The value of antihypertensive drugs: a perspective on medical innovation. *Health Affairs* 2007 Jan-Feb; 26(1):97-110.
- 9 Grabowksi, David C. et al. The Large Social Value Resulting From Use Of Statins Warrants Steps To Improve Adherence And Broaden Treatment. *Health Affairs*. 2012; 10 (2276-2285).
- 10 Timothy M. Dall et al. The Economic Impact of Medicare Part D on Congestive Heart Failure. *The American Journal of Managed Care*. May 2013, Vol 19, No.6 Sup.
- 11 Ashish K. Jha et al. Greater Adherence to Diabetes Drugs is linked to Less Hospital Use and Could Save Nearly \$5 Billion Annually. *Health Affairs*, 31, No.8 (2012): 1836-1846.
- 12 Burge R, Dawson-Hughes B, Solomon DH, Wong JB, King A, Tosteson A. (2007). Incidence and economic burden of osteoporosis-related fractures in the United States, 2005-2025. *J Bone Miner Res*.22 (3):465-75.
- 13 Siris ES, et al. (2006). Adherence to bisphosphonate therapy and fracture rates in osteoporotic women: relationship to vertebral and nonvertebral fractures from 2 US claims databases. *Mayo Clin Proc*. 81(8):1013-22
- 14 April, 2013.The Biopharmaceutical Industry Helps Strengthen the U.S. Economy. Retrieved from <http://www.phrma.org/economic-impact>.
- 15 M. Sokol et al., (2005)"Impact of Medication Adherence on Hospitalization Risk and Healthcare Cost," *Journal of Medical Care* 43 (6). Notes: Adherence is the extent to which patients take medicines as prescribed, in terms of dose and duration. Return on Investment estimates reflect spending attributable to the condition listed.