

Key Facts 2016

RESEARCH AND DEVELOPMENT (R&D)¹

Average time to develop a drug = **10 to 15 years**

Percentage of drugs entering clinical trials resulting in an approved medicine = less than **12%**

PERCENTAGE OF SALES THAT WENT TO R&D IN 2015⁵

Domestic R&D as a percentage of domestic sales = **24.8%**

Total R&D as a percentage of total sales = **19.8%**

MEDICINES IN DEVELOPMENT

Medicines in development globally = **7,000**¹⁴

Potential first-in-class medicines** across the pipeline = an average of **70%**¹⁵

Medicines in development to treat rare diseases = more than **450**¹⁶

DEVELOPMENT COSTS

Average cost to develop a drug (including the cost of failures):²

2000s–early 2010s = **\$2.6 billion**

1990s–early 2000s = **\$1.0 billion***

1980s = **\$413 million**

1970s = **\$179 million**

ECONOMIC IMPACT OF THE BIOPHARMACEUTICAL SECTOR⁶

Direct jobs = about **854,000**

Total jobs (including indirect and induced jobs) = more than **4.4 million**

R&D SPENDING

Year	PhRMA members ³
2015	\$58.8 billion (est.)
2014	\$53.3 billion
2013	\$51.6 billion
2012	\$49.6 billion
2011	\$48.6 billion
2010	\$50.7 billion
2009	\$46.4 billion
2008	\$47.4 billion
2007	\$47.9 billion
2006	\$43.0 billion
2005	\$39.9 billion
2000	\$26.0 billion
1990	\$8.4 billion
1980	\$2.0 billion



VALUE OF MEDICINES

Cancer: Since peaking in the 1990s, cancer death rates have declined **23%**.¹⁷ Approximately **83%** of survival gains in cancer are attributable to new treatments, including medicines.¹⁸

Hepatitis C: Just five years ago, treatment options for hepatitis C came with debilitating side effects and cured only half of patients over a course of treatment lasting up to 48 weeks.¹⁹ Today, a range of treatment options are available offering cure rates upwards of **90%**, with minimal side effects, in as few as 8 weeks.²⁰

HIV/AIDS: Since the introduction of highly active antiretroviral treatment (HAART), the HIV/AIDS death rate has dropped **87%**.²¹ As a result of HAART and all the medical innovations that followed, it is estimated that **862,000** premature deaths were avoided in the United States alone.²²

SALES

Generic share of prescriptions filled:⁴

2000 = **49%**

2015 = **91%**

APPROVALS

Novel medicines approved 2015 = **56**^{7,8}

Medicines approved since 2000 = more than **550**^{9,10,11}

In the 30 years since the Orphan Drug Act was established, more than **500** orphan drugs have been approved, with nearly **300** approved in the last decade alone¹²

Only **2 of 10** marketed drugs return revenues that match or exceed R&D costs¹³



¹Previous research by the same author estimated average R&D costs in the early 2000s at \$1.2 billion in constant 2000 dollars [see DiMasi JA, Grabowski HG. The cost of biopharmaceutical R&D: Is biotech different? *Managerial and Decision Economics*. 2007;28:469–479]. That estimate was based on the same underlying survey as the author's estimates for the 1990s to early 2000s reported here (\$800 million in constant 2000 dollars), but updated for changes in the cost of capital.

²Note: First-in-class medicines are those that use a different mechanism of action from any other already approved medicine.