

Rate of investment in medical research has declined in US, increased globally

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From 2004 to 2012, the rate of investment in medical research in the U.S. declined, while there has been an increase in research investment globally, particularly in Asia, according to a study in the January 13 issue of *JAMA*.

For the last century, [medical research](#), including public health advances, has been the primary source of and an essential contributor to improvement in the health and longevity of individuals and populations in developed countries. The United States has historically been where research has found the greatest support and has generated more than half the world's funding for many decades. Few previous analyses have compared medical research in the United States with other developed countries, according to background information in the article.

Hamilton Moses III, M.D., of the Alerion Institute and Alerion Advisors LLC, North Garden, Va., and Johns Hopkins School of Medicine, Baltimore, and colleagues examined developments over the past two decades in the pattern of who conducts and who supports medical research, as well as resulting patents, publications, and new drug and device approvals. Publicly available data from 1994 to 2012 were compiled showing trends in U.S. and international [research funding](#), productivity, and disease burden by source and industry type. Patents and publications (1981-2011) were evaluated using citation rates and impact factors.

Among the findings of the study:

Reduced science investment The largest increase in biomedical and health services research funding in the U.S. occurred between 1994 and 2004, when funding grew at 6 percent per year. However, from 2004 to 2012, the rate of investment growth declined to 0.8 percent annually and (in real terms) decreased in 3 of the last 5 years, reaching \$117 billion (4.5 percent) of total health care expenditures. From 1994 to 2004, the medical device, biotechnology, and pharmaceutical industries had annual growth rates greater than 6 percent per year, with biotechnology demonstrating the largest increases. The share of U.S. medical research funding from industry accounted for 46 percent in 1994 and grew to 58 percent in 2012.

Industry reduced early-stage research, favoring medical devices, bioengineered drugs, and late-stage clinical trials, particularly for cancer and rare diseases. National Institutes of Health (NIH) allocations did not correlate proportionately with disease burden. Cancer and HIV/AIDS were funded well above the predicted levels based on U.S. disability alone, with cancer accounting for 16 percent of total NIH funding and 25 percent of all medicines currently in clinical trials.

Underfunding of service innovation Health services research (which examines access to care, the quality and cost of care, and the health and well-being of individuals, communities, and populations), accounted for between 0.2 percent and 0.3 percent of national health expenditures between 2003 and 2011, an approximately 20-fold difference in comparison with total medical research funding. Private insurers ranked last (0.04 percent of revenue) and health systems 19th (0.1 percent of revenue) among 22 industries in their investment in innovation. An increment of \$8 billion to \$15 billion yearly would occur if service firms were to reach median research and development funding.

Globalization U.S. government research funding declined from 57 percent (2004) to 50 percent (2012) of the global total, as did that of

U.S. companies (50 percent to 41 percent), with the total U.S. (public plus private) share of global research funding declining from 57 percent to 44 percent. Asia, particularly China, tripled investment from \$2.6 billion (2004) to \$9.7 billion (2012). The U.S. share of life science patents declined from 57 percent (1981) to 51 percent (2011), as did those considered most valuable, from 73 percent (1981) to 59 percent (2011).

"The analysis underscores the need for the United States to find new sources to support medical research, if the clinical value of its past science investment and opportunities to improve care are to be fully realized. Substantial new private resources are feasible, though public funding can play a greater role. Both will require non-traditional approaches if they are to be politically and economically realistic. Given global trends, the United States will relinquish its historical innovation lead in the next decade unless such measures are undertaken," the authors conclude.

"To achieve a new strategic vision for research, the United States will need a roadmap that sets priorities, describes needed structural and organizational changes, and creates an environment that enables innovation," write Victor J. Dzau, M.D., of the Institute of Medicine, Washington, D.C., and Harvey V. Fineberg, M.D., Ph.D., of the University of California, San Francisco, in an accompanying editorial.

"The needed changes include better coordination across funders and research institutions, development of new [funding](#) sources, improved grant evaluation processes, changes in education and training, rationalization of capital investments, and improved operational efficiencies. By taking the necessary political and institutional steps to ensure commitment of adequate resources over time, adopting a comprehensive research strategy, and attaining greater coordination and efficiency, the United States can retain its leadership position in

biomedical research."

More information: *JAMA*, [DOI: 10.1001/jama.2014.15939](https://doi.org/10.1001/jama.2014.15939)
JAMA, [DOI: 10.1001/jama.2014.17660](https://doi.org/10.1001/jama.2014.17660)

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