

Welcome to

NIST

Why Are We Here Today?

Michael.D. Amos, Ph.D.
Biosciences Advisor
Director's Office
Chemical Science and Technology Laboratory
National Institute of Standards and Technology
100 Bureau Drive
Gaithersburg, MD 20899
301-975-8631
mamos@nist.gov
<http://www.cstl.nist.gov/>

Disease is a huge U.S. economic burden

According to an article in [Forbes magazine](#), based on research from AHRQ (Agency for Health Care Research and Quality), the nine "**Most Expensive Diseases**" in the U.S. are:

Heart conditions at \$68 billion **
Trauma at \$56 billion
Cancer at \$48 billion
Mental illness at \$48 billion
Respiratory ailments at \$45 billion
Hypertension at \$32.5 billion
Arthritis and joint disorders at \$32 billion
Diabetes at \$28 billion
Back problems at \$23 billion

** excludes hypertension and elevated cholesterol

Disease numbers are growing

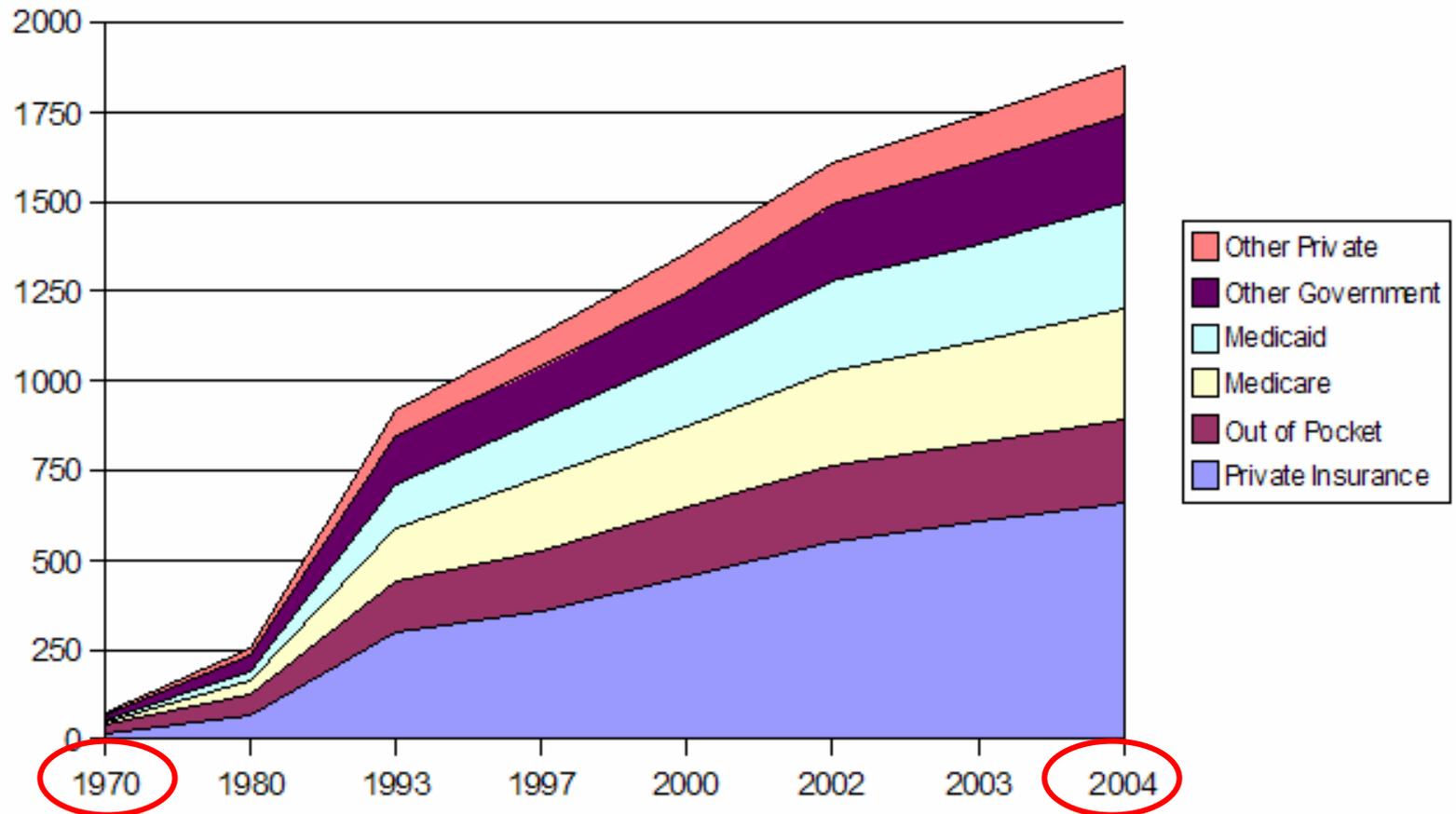
"The Fastest Growing Diseases" in the U.S. are

Esophageal Disorders
High Cholesterol
Hemorrhoids
Anxiety Disorders
Breast Cancer
Non specific Chest Pain
Arthritis
Viral Infections
Lupus and Connective Tissue Disorders
Asthma

These numbers are based on costs of drugs and treatments, as well as the number of patients diagnosed

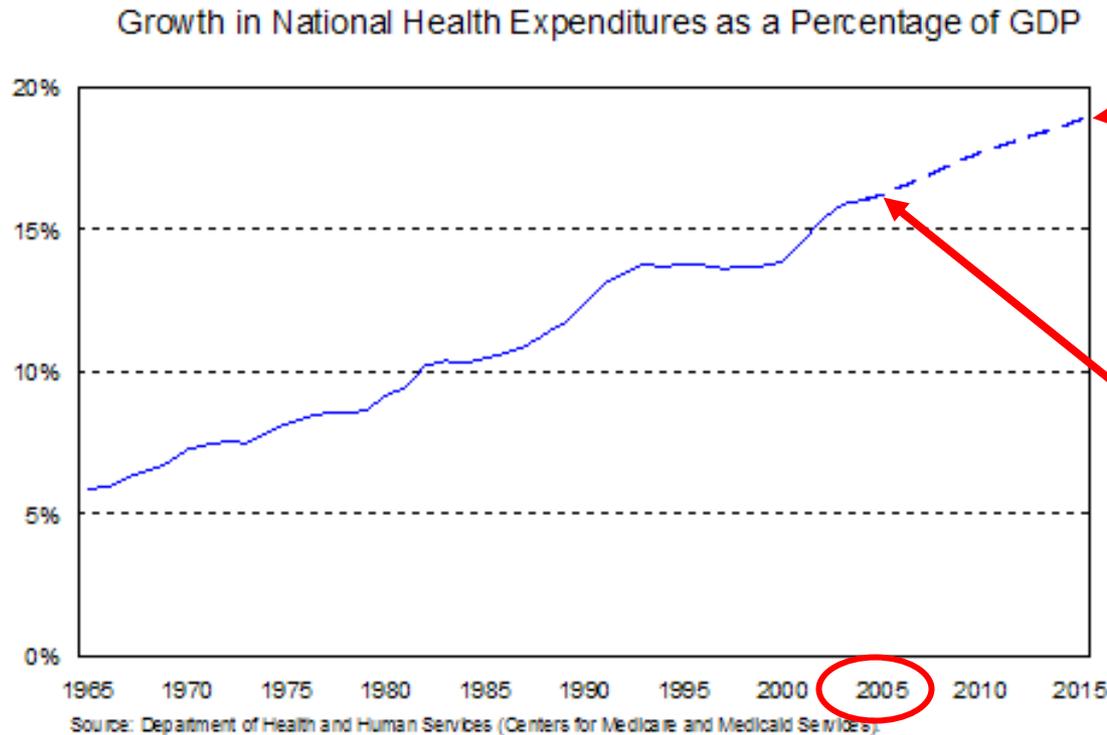
[Forbes magazine](#)

National Health Expenditures (current \$billions)



Source: Graph from *Healthcare-Economist.com* from article by Cynthia Smith, Cathy Cowan, Stephen Heffler, Aaron Catlin; "National Health Spending In 2004: Recent Slowdown Led By Prescription Drug Spending" *Health Affairs*, January/February 2006; 25(1): 186-196.

The slope is not predicted to change



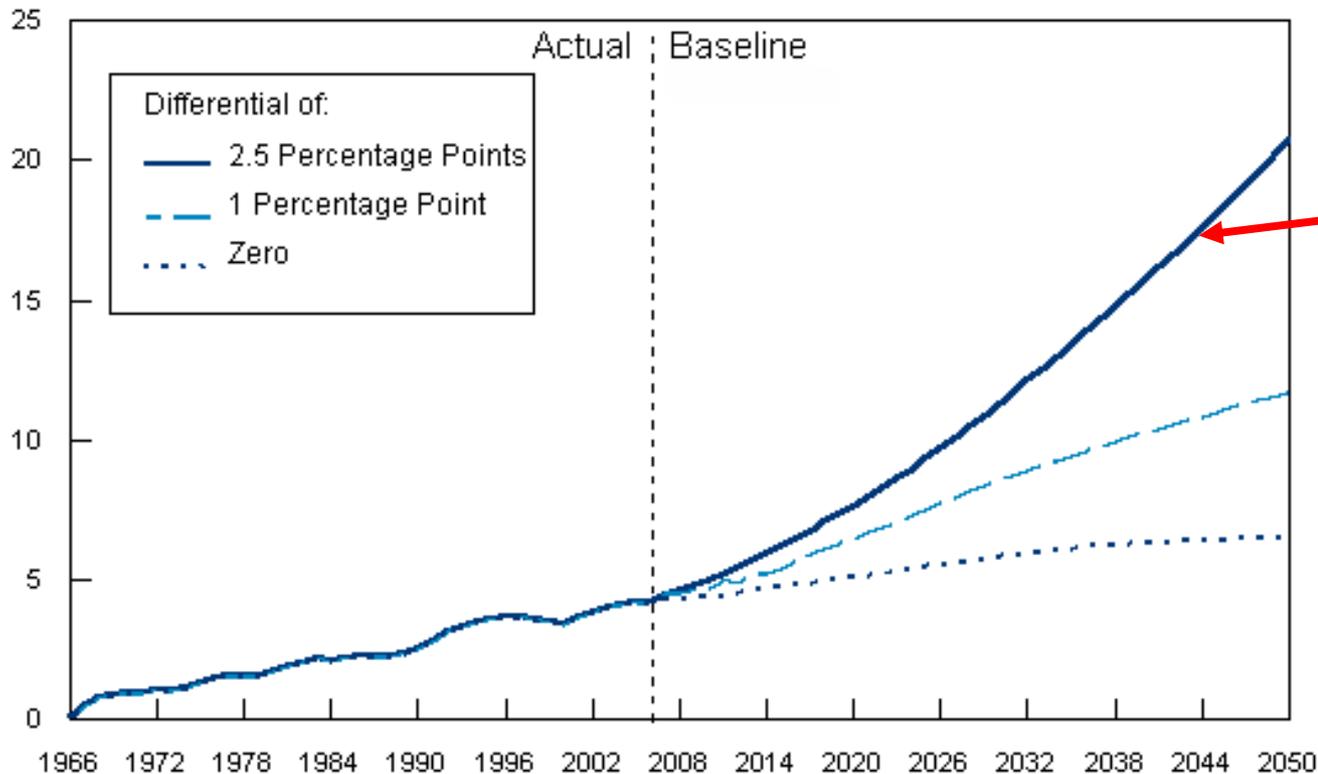
Projected
\$4 trillion
18.7% of GDP

Currently
\$2 trillion
17% of GDP

From: www.whitehouse.gov

Federal spending trend

Medicare's and Medicaid's costs per beneficiary have increased about 2.5 percentage points faster per year than has per capita gross domestic product (GDP).



Current Trend

Source: CBO.gov

The older we get – the more expensive health care becomes

TABLE I

Health Care Spending by the Elderly

Year	As a Percent of Cash Income [*]	As a Share of Total Potential Consumption ^{**}
2006	63.56%	43.42%
2010	69.89%	46.31%
2020	75.61%	48.80%
2030	85.92%	52.90%
2040	101.79%	58.48%
2050	115.40%	62.71%
2060	124.83%	65.39%
2070	132.75%	67.49%
2080	138.40%	68.91%

^{*} "Cash income" refers to income from all sources including earnings, Social Security, income from defined benefit and defined contribution plans, asset income and other income.

^{**} "Total potential consumption" refers to cash income plus health care benefits paid by third parties net of the premium payments from retirees.

Source: Authors' estimates.

Source: National Center for Policy Analysis – NCPA.ORG

How do we change the slope?

Some say “Not a Problem”

We’re rich enough and we can afford it

But what about providing “HEALTH” and reducing pain and suffering?

Some say just “cut expenditures”

Electronic health records are part of the solution!

But where else?

Who would get less care?

Which health care providers would be paid less?

What company is willing to take less for their products and services?

The Solution? - KEEP PEOPLE FROM GETTING DISEASE

The ultimate objective of any health care system is to promote health, whether by treating diseases that arise or **by preventing them from occurring in the first place.**

CBO TESTIMONY, Statement of [Peter R. Orszag](#), Director,

United States Senate

June 21, 2007

Is it possible?

Maybe

One way it might happen is

Through better technology

Some say new technologies will increase health care costs

Medical technology spending comprised about 20 percent of the growth in health-care costs for the last five years, and now exceeds \$200 billion annually.

U.S. Health Care's Technology Cost Crisis *By Charles Beever, Heather Burns, and Melanie Karbe* <http://www.strategy-business.com/press/enewsarticle/enews033104>

But are we focusing on all the right technologies?

Through an **expanded focus** on preventative technologies

Shift the health care paradigm

From: Mostly diagnosis and treatment of diseases

To: **More prevention**, diagnosis and treatment of diseases

Should the new technology focus on:

- Understanding the biology of the **healthy** human system?
- Understand the biology of **transitions** from health to disease?
- Understand the nutritional, environmental and medical steps to **prevent** disease?

Why NIST?

NIST Mission

To promote U.S. **innovation** and industrial **competitiveness** by advancing **measurement science, standards, and technology** in ways that enhance *economic security* and improve our *quality of life*.

NIST Role in the Biosciences

To leverage our vast expertise in the **quantitative physical and informational sciences** to provide the measurement infrastructure to underpin increased **innovation in the biosciences**.

Why NIST?

Improvements in **biochemical measurements, bioimaging, and information technologies** are increasingly allowing medicine to shift from diagnosis and treatment to personalized preventive medicine and providing a quality, cost-effective, and accessible health care delivery system.

Measurement and standards that support use of these new technologies will be very important for helping the health care industry make this paradigm shift.

This conference is a major step toward helping NIST and other organizations identify and respond to these **critical measurement and standards needs**.

Tell us what you think

NIST