Biomedical Research Grant Funding Programs

Return on Public Investment

Spring 2017

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Overview

- In this discussion, we will cover:
  - Scope of research grant funding programs
  - Costs associated with health problems, with a focus on Alzheimer's disease, cancers, and tobacco-related diseases
  - Economic impact of public health research
  - Long-term impact of public research grants funds

Scope of Grant Funding Programs

- William G. Bankhead, Jr., and David Coley Cancer Research Program, 381.922 F.S.

- James and Esther King Biomedical Research Program, 215.5602 F.S.

- Ed and Ethel Moore Alzheimer's Disease Research Program, 381.82 F.S.

Program Priorities

- Advance knowledge of prevention, diagnoses, treatments, and cures
- Build research infrastructure in the state of Florida
- Secure external funding
- Stimulate economic activity

Defining Cost Burden of Illness

Direct costs
(medical expenditures)
+
Indirect costs
(productivity losses)

Total cost burden of illness

Measuring Direct Costs

- Alzheimer's Disease & Dementia: $259 billion in 2017[i]
  - Projected to reach $1.1 trillion by 2050
- Cancers: $124.6 billion in 2010[ii]
  - Projected to reach $173 billion by 2020
- Heart Disease and Stroke: $193.4 billion 2010[iii]

- Smoking-Attributable Expenditures: $133 billion from 2009-2012[iv]

Measuring Indirect Costs

- Years of Life Lost (YLL): number of productive years lost due to premature death

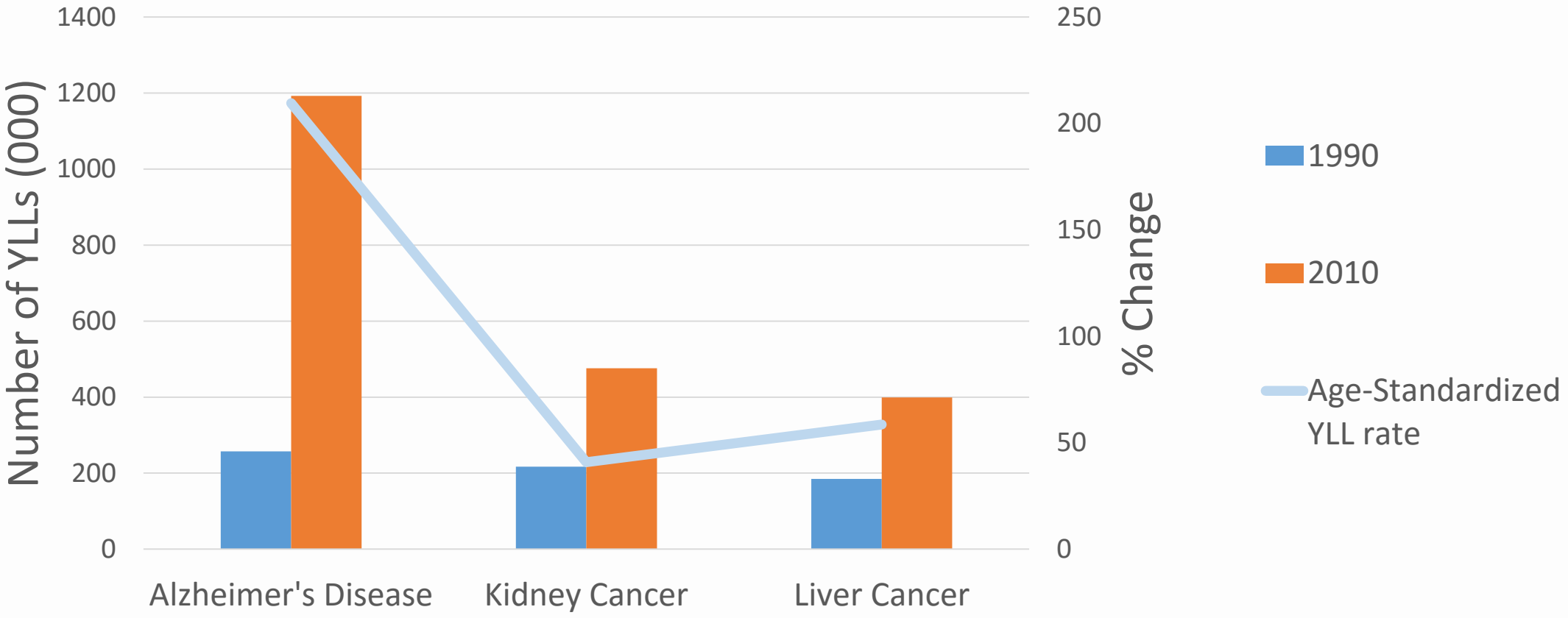
- Years Lived with a Disability (YLD): number of productive years in which performance may have been limited

- Disability-Adjusted Life Years (DALYs): measure of overall disease burden, taking into account both premature death and performance-impacting symptoms

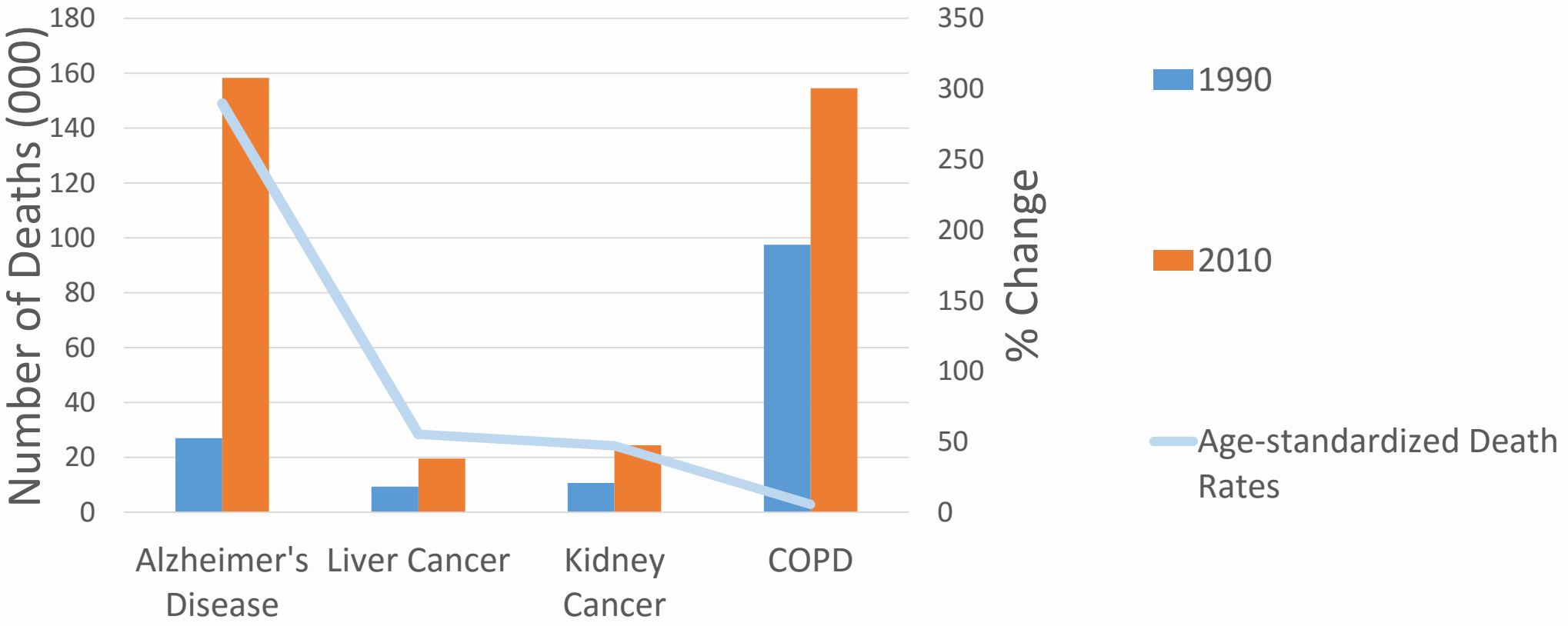
National Costs: Years of Life Lost, 1990-2010

- 17 of top 30 diseases in terms of years of life lost in 2010 equal about 23.2 million
  - Alzheimer's disease: 1.2 million years of life lost
  - Cancers: 7.9 million years of life lost
  - Tobacco-related diseases: 14.1 million years of life lost
    - Includes ischemic heart disease, stroke, COPD, etc.

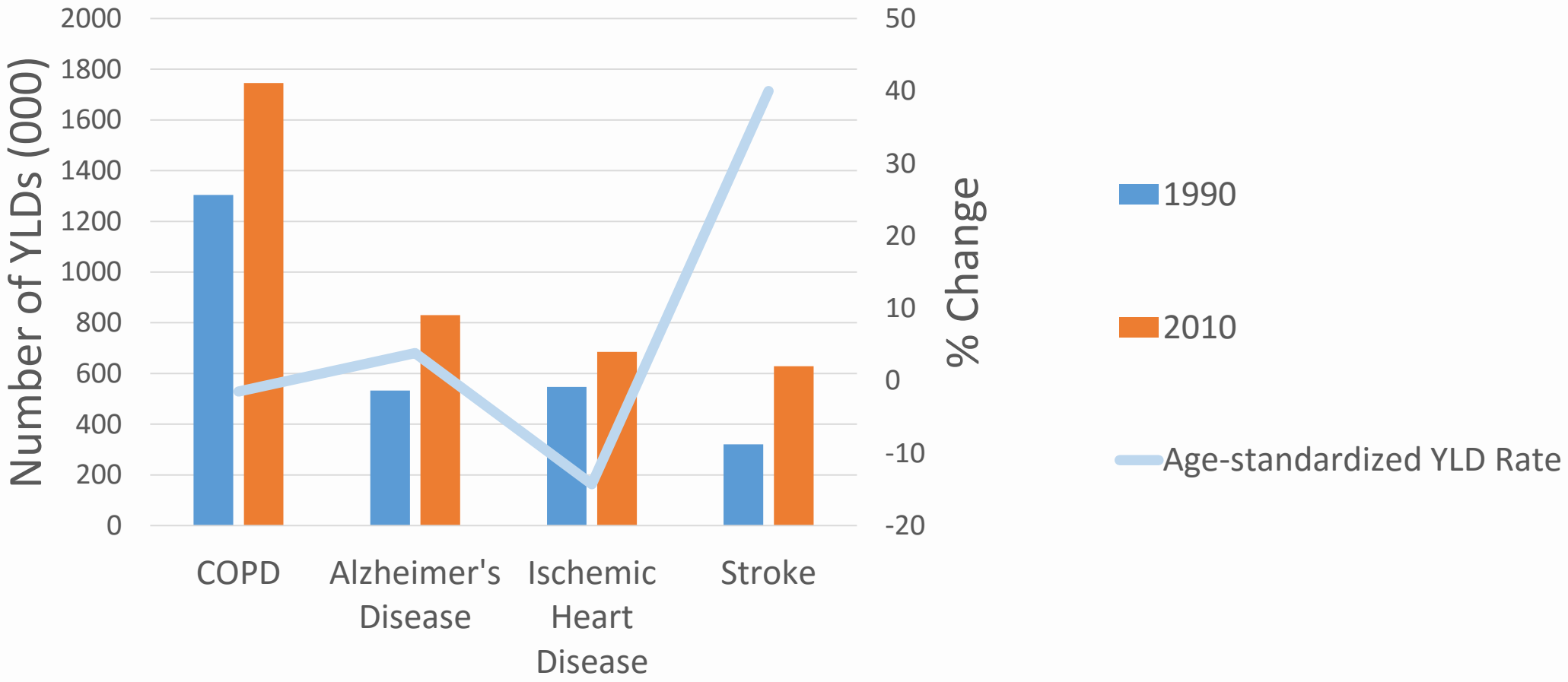
National Costs: Years of Life Lost, 1990-2010



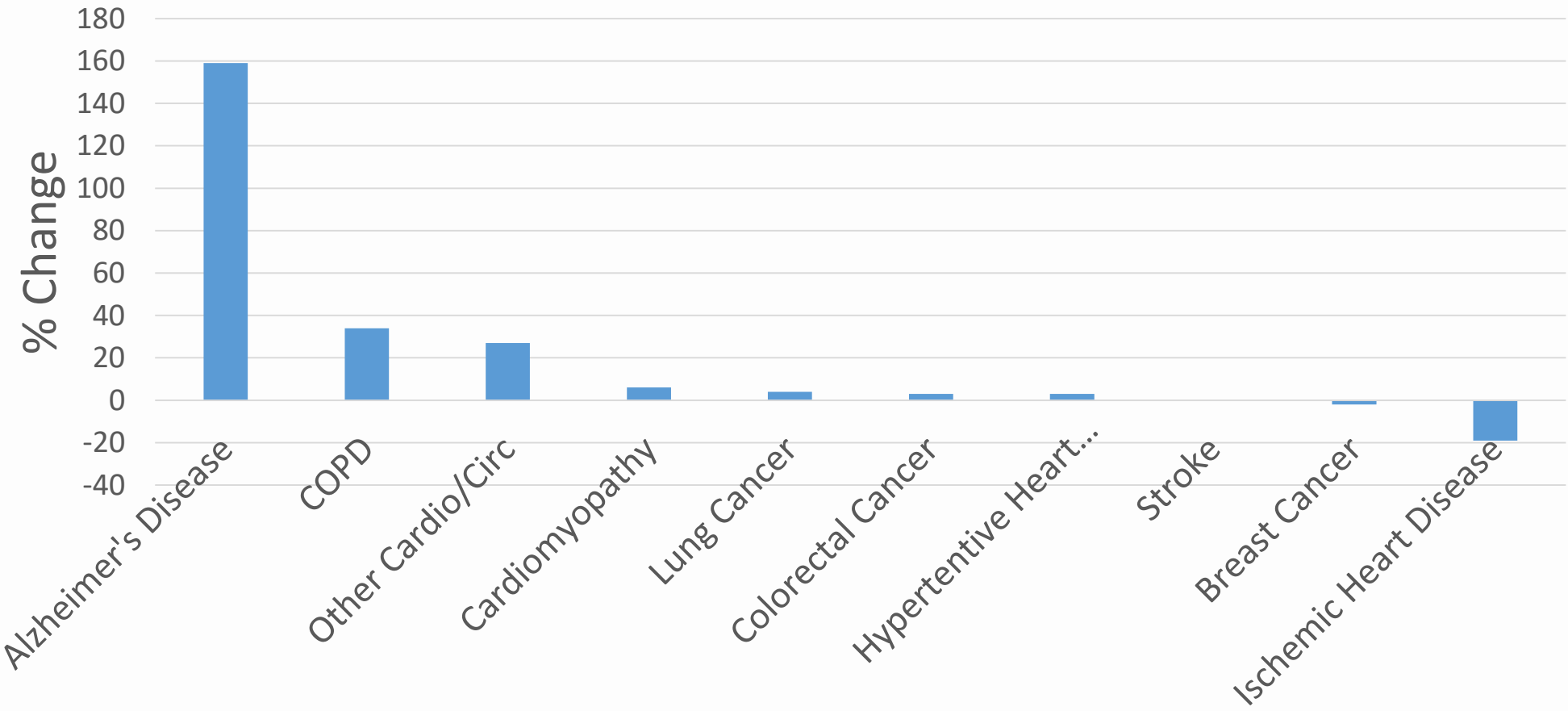
National Costs: Age-standardized death rates 1990-2010



National Costs: Years Lived with Disability, 1990-2010



National Costs: Disability-Adjusted Life Years, 1990-2010



Costs to the State of Florida

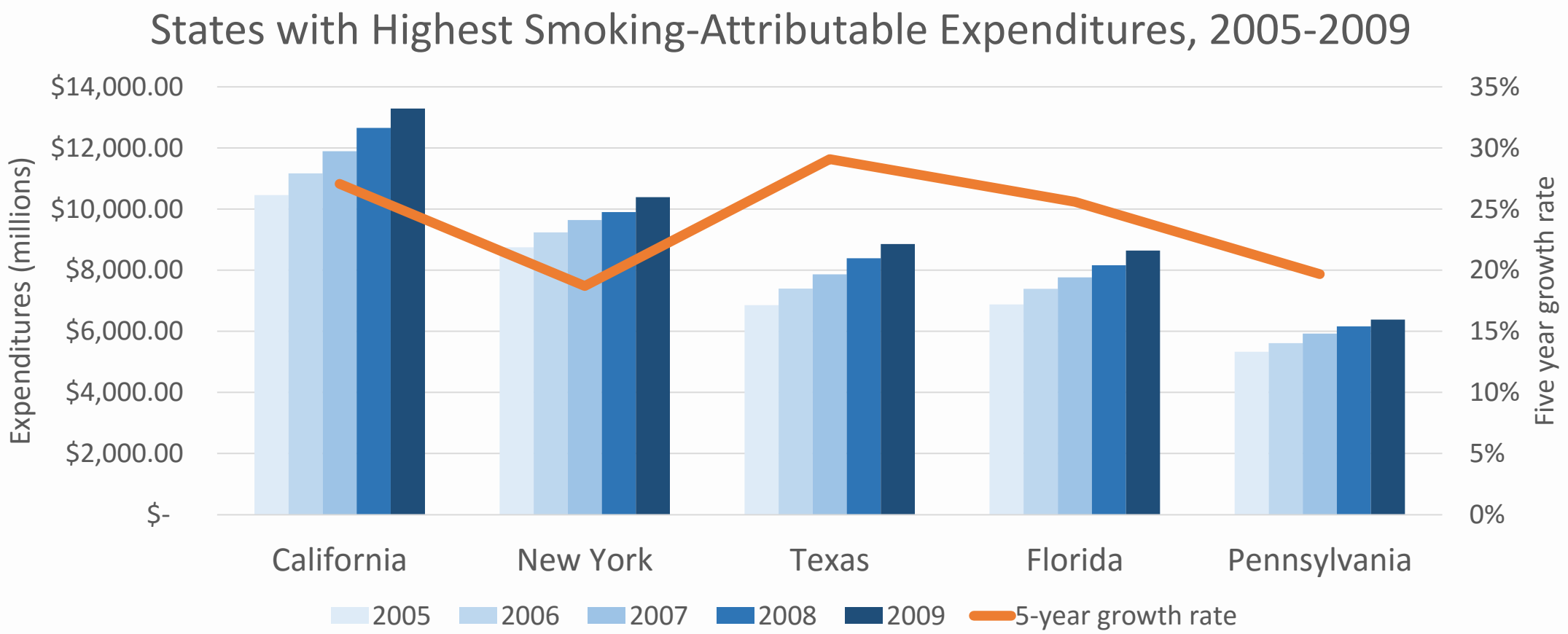
- Alzheimer's Disease
  - 7,021 lives lost in 2015[i]
  - 220% Increase in years-of-life-lost from 1990 to 2015[i]
  - 298% increase in age-standardized death rate from 1990 to 2015[i]
  - Unpaid care in 2015 = $15 billion[ii]
  - Medicaid Costs in 2016 = $2.3 billion[ii]
    - Projected to increase to $3.4 billion by 2025

- Cancers
  - 42,538 lives lost in 2013[iii]
  - Total medical care costs = $12.7 billion in 2010[iv]
    - Projected to increase to $25 billion by 2020

Costs to the State of Florida

- Tobacco-Related Diseases,
  - Heart Disease = 17,586 deaths in 2010
  - Chronic Lower Resp. Disease = 5,327 deaths in 2010
  - About 29.4% of cancer deaths attributable to smoking
  - Annual health care costs = $8.64 billion in 2014
  - Medicaid costs = $1.51 billion in 2014
  - Smoking-caused productivity losses in Florida = $8.32 billion in 2014

Costs to the State of Florida



Economic Impact of Public Health Research

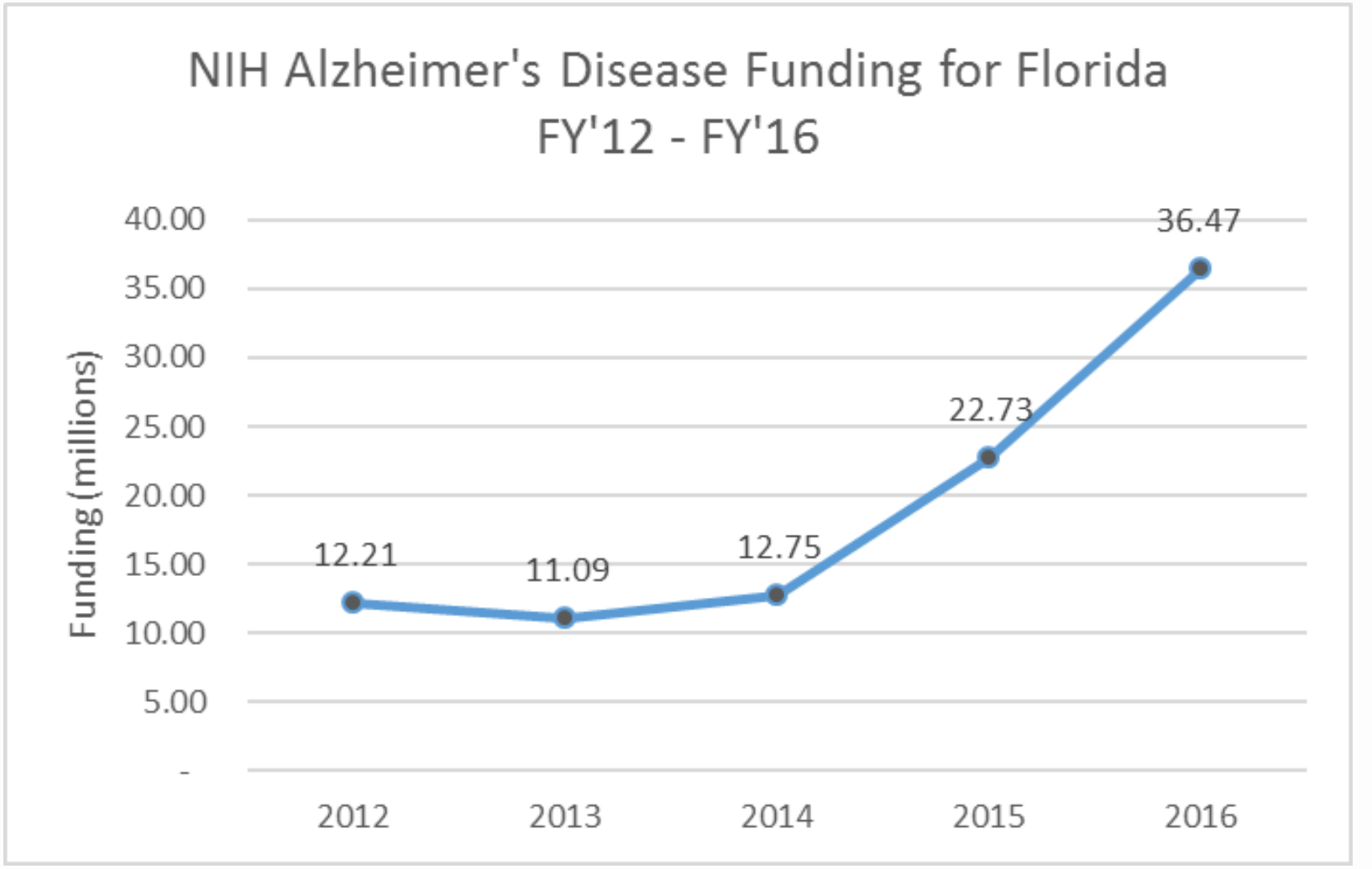
- NIH Grants
  - Basic Research: $1 = $8.38 in industry Research & Development after 8 years[i]
  - Clinical Research: $1 = $2.35 in industry Research & Development after 3 years[i]
- In Florida:
  - 2007 NIH investment = $346 million[ii]
    - 5,828 high-wage jobs
    - $745 million in new business activity, a multiplier of 2.15
  - 2015 NIH investment = $521 million[iii]
    - 11,727 high-wage jobs
    - $1.6 billion in new business activity, a multiplier of 3.14

Economic Impact of Public Health Research

National Institutes of Health Alzheimer's Disease Research
State Funding and Rankings Fiscal Year 2016

State	Total Funding	Rank
CA	$ 156,244,198	1
NY	$ 115,043,137	2
MA	$ 94,603,431	3
PA	$ 71,180,025	4
IL	$ 51,897,583	5
MD	$ 42,993,394	6
FL	**$ 36,473,997**	**7**
MO	$ 35,152,410	8
TX	$ 32,026,183	9
NC	$ 22,627,053	10
WA	$ 20,343,404	11
WI	$ 19,178,081	12
MN	$ 18,661,012	13
MI	$ 16,325,295	14
GA	$ 14,828,352	15
IN	$ 14,197,398	16
OH	$ 13,551,120	17
AZ	$ 13,103,040	18
CT	$ 11,991,450	19
KY	$ 10,349,108	20

Economic Impact of Public Health Research

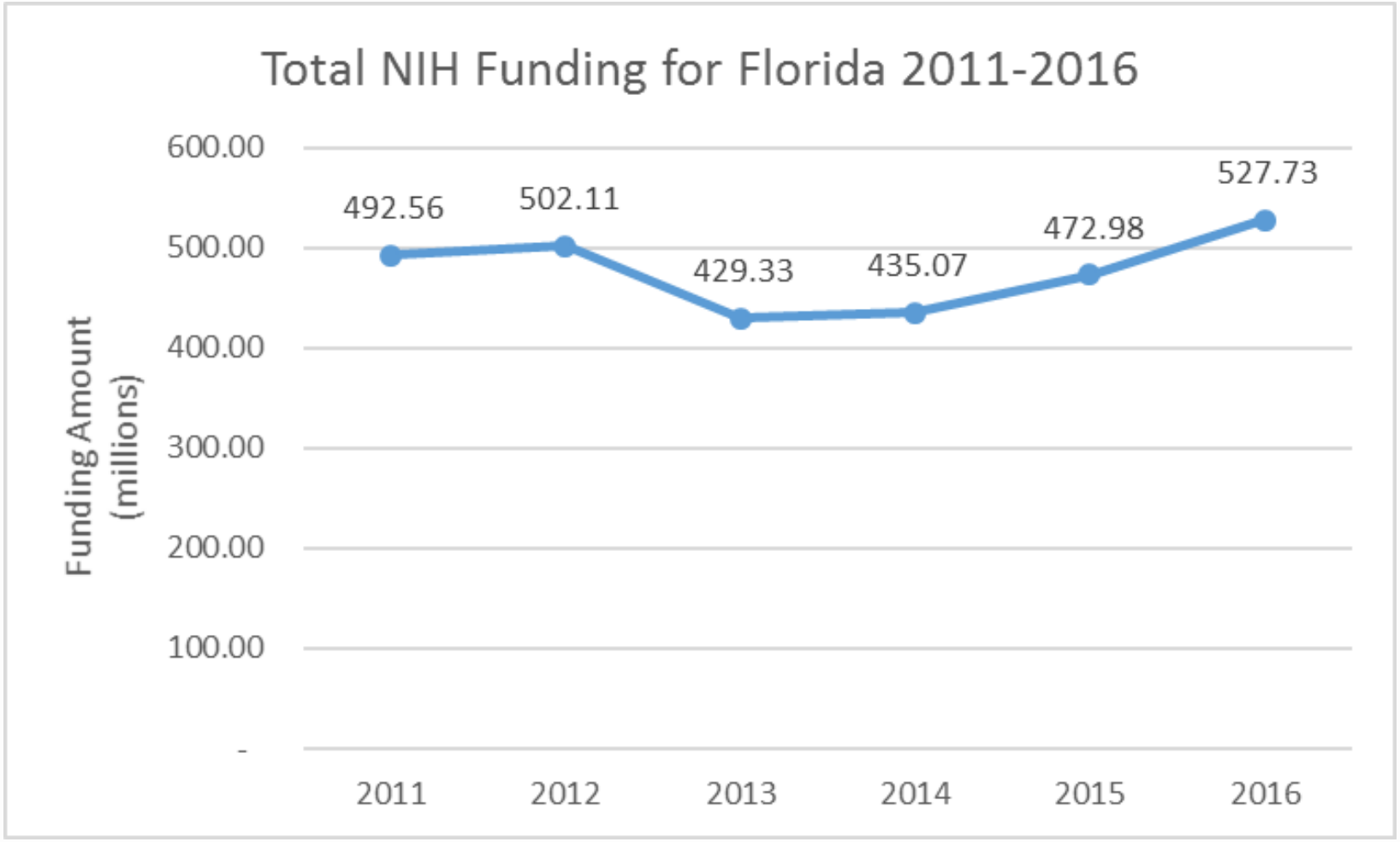


Economic Impact of Public Health Research

Overall Federal Research Funding Totals and Rankings by State, 2016

State	NIH Funding	Rank	Total (NIH, CDC, NSF, AHRQ)*	Rank
California	$3,581,764,094	1	$3,891,905,345	1
Massachusetts	$2,519,342,334	2	$2,579,487,932	3
New York	$2,149,771,633	3	$2,734,502,129	2
Pennsylvania	$1,538,118,189	4	$1,633,737,641	4
North Carolina	$1,067,284,633	5	$1,176,758,751	7
Texas	$1,040,799,728	6	$1,197,032,537	6
Maryland	$984,919,207	7	$1,548,145,413	5
Washington	$862,176,970	8	$1,010,349,539	8
Illinois	$794,979,202	9	$906,014,462	9
Ohio	$694,751,046	10	$774,600,329	10
Michigan	$654,349,171	11	$739,694,569	11
Florida	**$527,733,701**	**12**	**$685,727,275**	**13**
Minnesota	$513,335,268	13	$577,721,320	14
Connecticut	$506,188,803	14	$516,097,284	17
Georgia	$497,568,909	15	$695,114,170	12

Economic Impact of Public Health Research



FDOH Biomedical Research Funding Program: Long-term Effects Survey

- Follow-on Funding
  - More than 50% reported receiving additional funding, totaling over $108 million. Most federal awards averaged over $1.2 million
  - Additional internal analysis
    - Between 2001 and 2016, $250.92 million in grants generated $260.94 million in follow-on.
    - Every $1 in grant awards generated $1.04 in follow-on funding

FDOH Biomedical Research Funding Program: Long-term Effects Survey

- Innovation
  - About 30% of respondents reported either filing for patents or acquiring intellectual properties
  - About 10% of respondents reported the development of new drugs or devices
  - More than 80% of respondents reported publications of grant funded research in prestigious scientific journals

FDOH Biomedical Research Funding Program: Long-term Effects Survey

- Business activities
  - More than 50% reported establishing new, permanent employee positions (272 permanent positions)
  - About 50% reported new hourly employment opportunities (178 hourly positions)
  - Eight respondents reported new start-up companies
  - Eight reported opening new clinics

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