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School of Public Health

# Financial Incentives and the Delivery of Low- and High-Value Care

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# Disclosures

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- No conflicts of interest
- National Institute on Aging  
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- National Institute of General Medical Sciences  
U54GM115677

# Value-based Insurance Design: Case Studies

## High-Value Care

Cost-sharing  
Elimination



Breast Cancer  
Screening Rates

## Low-Value Care

Insurer's  
Incentives



Use of Low-  
Value Services

# Value-based Insurance Design (VBID)

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- Generosity of insurance coverage for a service is relative to the value of that service in improving health
- A VBID program couples (balances?)
  - cost-sharing reductions for high-value services
  - cost-sharing increases for services not identified as high value

# Operationalization of Value for VBID



Grade	Definition	Suggestions for Practice
<b>A</b>	The USPSTF recommends the service. There is high certainty that the net benefit is substantial.	Offer or provide this service.
<b>B</b>	The USPSTF recommends the service. There is high certainty that the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial.	Offer or provide this service.
<b>C</b>	The USPSTF recommends selectively offering or providing this service to individual patients based on professional judgment and patient preferences. There is at least moderate certainty that the net benefit is small.	Offer or provide this service for selected patients depending on individual circumstances.
<b>D</b>	The USPSTF recommends against the service. There is moderate or high certainty that the service has no net benefit or that the harms outweigh the benefits.	Discourage the use of this service.
<b>I</b> Statement	The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of the service. Evidence is lacking, of poor quality, or conflicting, and the balance of benefits and harms cannot be determined.	Read the clinical considerations section of USPSTF Recommendation Statement. If the service is offered, patients should understand the uncertainty about the balance of benefits and harms.

# Cost-Sharing Elimination in VBID

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- The Affordable Care Act (ACA) required most private insurance plans and the federal Medicare program to **eliminate cost sharing for preventive services** that are recommended by the USPSTF (Grade A or B)
- One of the first large-scale applications of VBID

[#ThanksObama](#)

# Co-Payments Do Matter

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- A requirement for even modest copayments for mammograms or Pap smears reduces the number of women who receive this care.
- The negative effects of copayments are
  - larger for mammography than for other preventive services
  - more pronounced among women of lower SES status

# What if We Removed Co-Payments?

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*The* NEW ENGLAND JOURNAL *of* MEDICINE

SPECIAL ARTICLE

## Elimination of Cost Sharing for Screening Mammography in Medicare Advantage Plans

Amal N. Trivedi, M.D., M.P.H., Bryan Leyva, B.A., Yoojin Lee, M.S.,  
Orestis A. Panagiotou, M.D., Ph.D., and Issa J. Dahabreh, M.D.



# Why Breast Cancer Screening?

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- Breast cancer is the second leading cause of cancer mortality among women; most commonly occurs in older women.
- Out-of-pocket payments for preventive services disproportionately affect women
  - higher out-of-pocket spending on health care and are
  - more likely to delay or avoid recommended preventive care because of costs
- Of the 44 preventive services recommended by the USPSTF for adults, 26 apply specifically to women
  - none apply specifically to men

# High-Value Breast Cancer Screening

- USPSTF: biennial mammography screening for women 50 to 74 years of age (Grade B)
- Max Benefit: “women aged 60 to 69 years are most likely to avoid breast cancer death through screening”

## Final Recommendation Statement

### Breast Cancer: Screening

Recommendations made by the USPSTF are independent of the U.S. government. They should not be construed as an official position of the Agency for Healthcare Research and Quality or the U.S. Department of Health and Human Services.

#### Recommendation Summary

Population	Recommendation	Grade (What's This?)
Women aged 50 to 74 years	The USPSTF recommends biennial screening mammography for women aged 50 to 74 years.	<b>B</b>
Women aged 40 to 49 years	<p>The decision to start screening mammography in women prior to age 50 years should be an individual one. Women who place a higher value on the potential benefit than the potential harms may choose to begin biennial screening between the ages of 40 and 49 years.</p> <ul style="list-style-type: none"><li>• For women who are at average risk for breast cancer, most of the benefit of mammography results from biennial screening during ages 50 to 74 years. Of all of the age groups, women aged 60 to 69 years are most likely to avoid breast cancer death through mammography screening. While screening mammography in women aged 40 to 49 years may reduce the risk for breast cancer death, the number of deaths averted is smaller than that in older women and the number of false-positive results and unnecessary biopsies is larger. The balance of benefits and harms is likely to improve as women move from their early to late 40s.</li><li>• In addition to false-positive results and unnecessary biopsies, all women undergoing regular screening mammography are at risk for the diagnosis and treatment of noninvasive and invasive breast cancer that would otherwise not have become a threat to their health, or even apparent, during their lifetime (known as “overdiagnosis”). Beginning mammography screening at a younger age and screening more frequently may increase the risk for overdiagnosis and subsequent overtreatment.</li><li>• Women with a parent, sibling, or child with breast cancer are at higher risk for breast cancer and thus may benefit more than average-risk women from beginning screening in their 40s.</li></ul> <p>Go to the <a href="#">Clinical Considerations section</a> for information on implementation of the C recommendation.</p>	<b>C</b>

# Aims

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1. Does the elimination of cost sharing increase rates of screening mammography among older women?
2. Do the effects of eliminating cost sharing vary according to race, ethnic group, and socioeconomic status?

# Study Design

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- Difference-in-differences analysis of biennial screening rates with mammography
  - **Intervention:** n=24 Medicare Advantage plans that eliminated cost sharing for mammography screening
  - **Control:** n=48 Medicare Advantage plans that had and maintained full coverage

# Study Population

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- Women 65 years of age or older
- Eligible for the HEDIS quality measure for breast-cancer screening:
  - continuous enrolled in the Medicare Advantage plan for 2 years with no gap in coverage exceeding 45 days.
  - before 2012, the upper age limit for the HEDIS indicator was 69 years (i.e. 65-69 y.o.)
  - after 2012, the upper age limit was 74 years (i.e. 65-74 y.o.)

# Study Sample

**Table 1.** Characteristics of the Study Sample.\*

Variable	Intervention Plans	Control Plans
No. of unique enrollees	15,085	52,035
No. of observations	16,202	61,164
Age (yr)	67.6±1.2	67.8±1.2
Race or ethnic group (%)†		
White	81	80
Black	8	10
Hispanic	8	8
Other	2	3
ZIP Code–level characteristics		
Completed high school (%)‡	86	87
Below poverty level (%)§	16	15

# Outcome

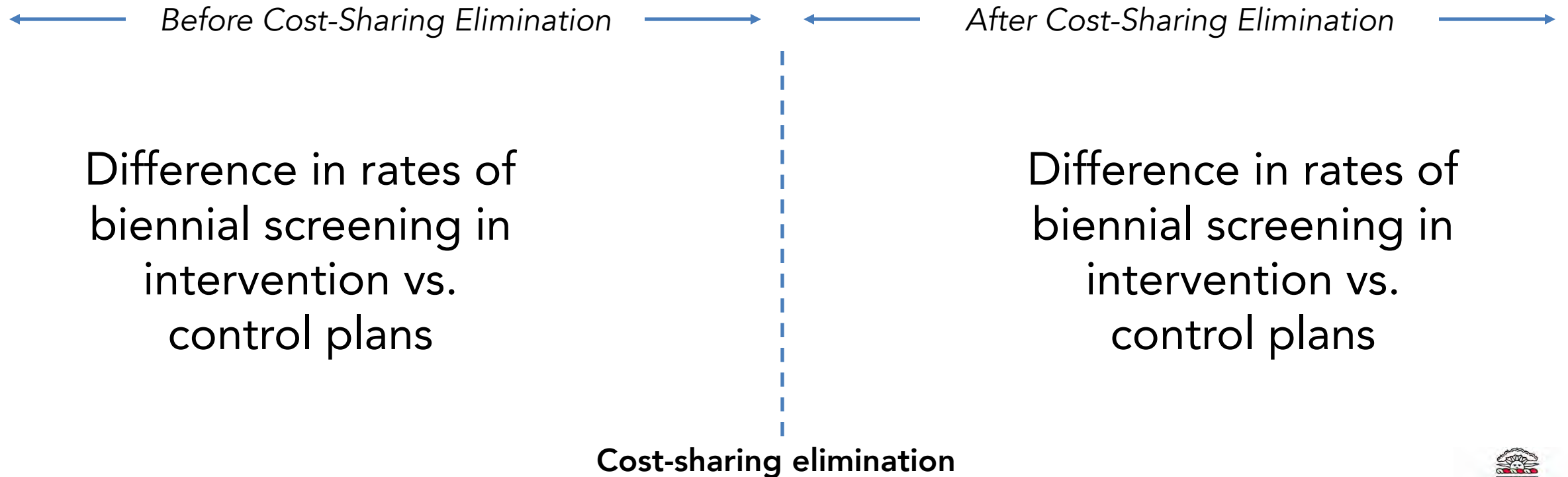
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- Biennial screening with mammography
  - at least one screening mammogram received in a given calendar year or the year before
- Primary independent variable
  - the product term of enrollment in an intervention plan and time period (before or after the elimination of cost sharing)

# Statistical Analysis

## Difference-in-Differences analysis





# Results

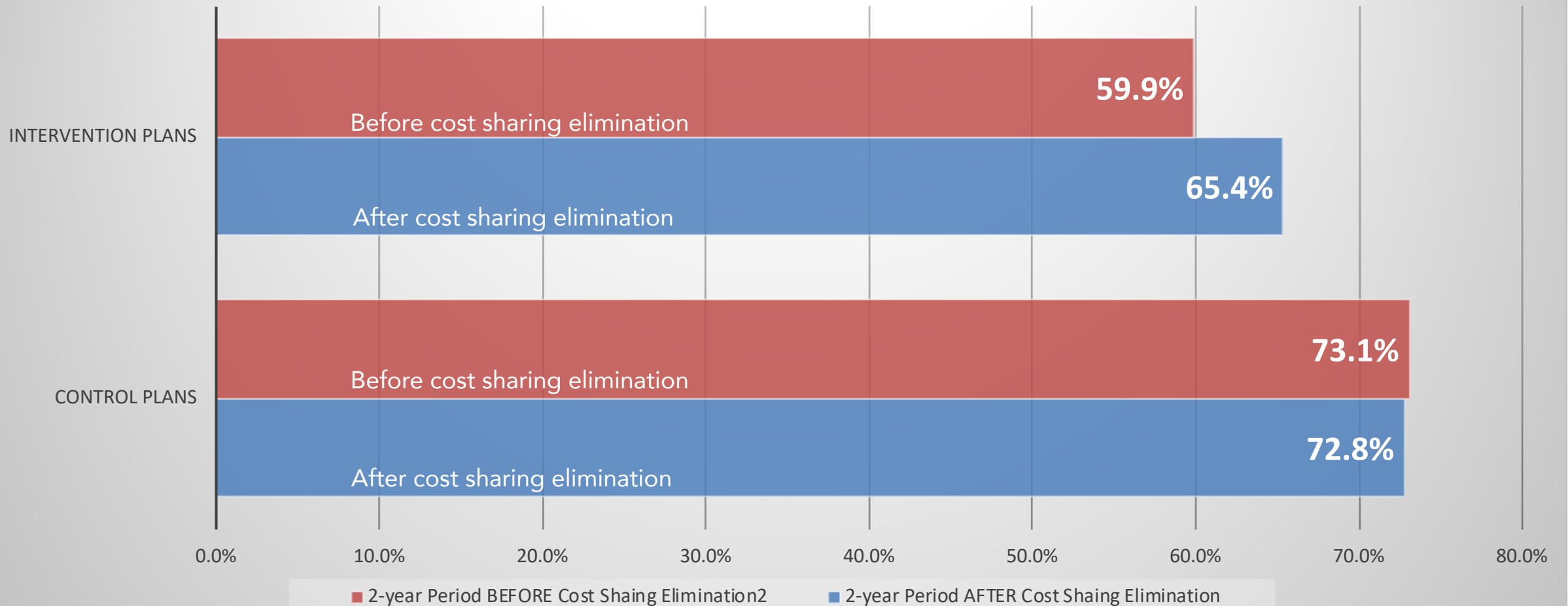
- Women in intervention plans
  - younger
  - less likely to be a member of a racial or ethnic minority group,
  - more likely to be living in areas with lower rates of high-school completion and higher rates of poverty
- Types of cost-sharing eliminated
  - coinsurance of 20% (n=2 plans)
  - copayments of \$25 or \$30 (n=22 plans)

**Table 1. Characteristics of the Study Sample.\***

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# Changes in Screening Rates

## Rates of Biennial Screening Mammography



# Effect Of Cost Sharing Elimination

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Screening Rates

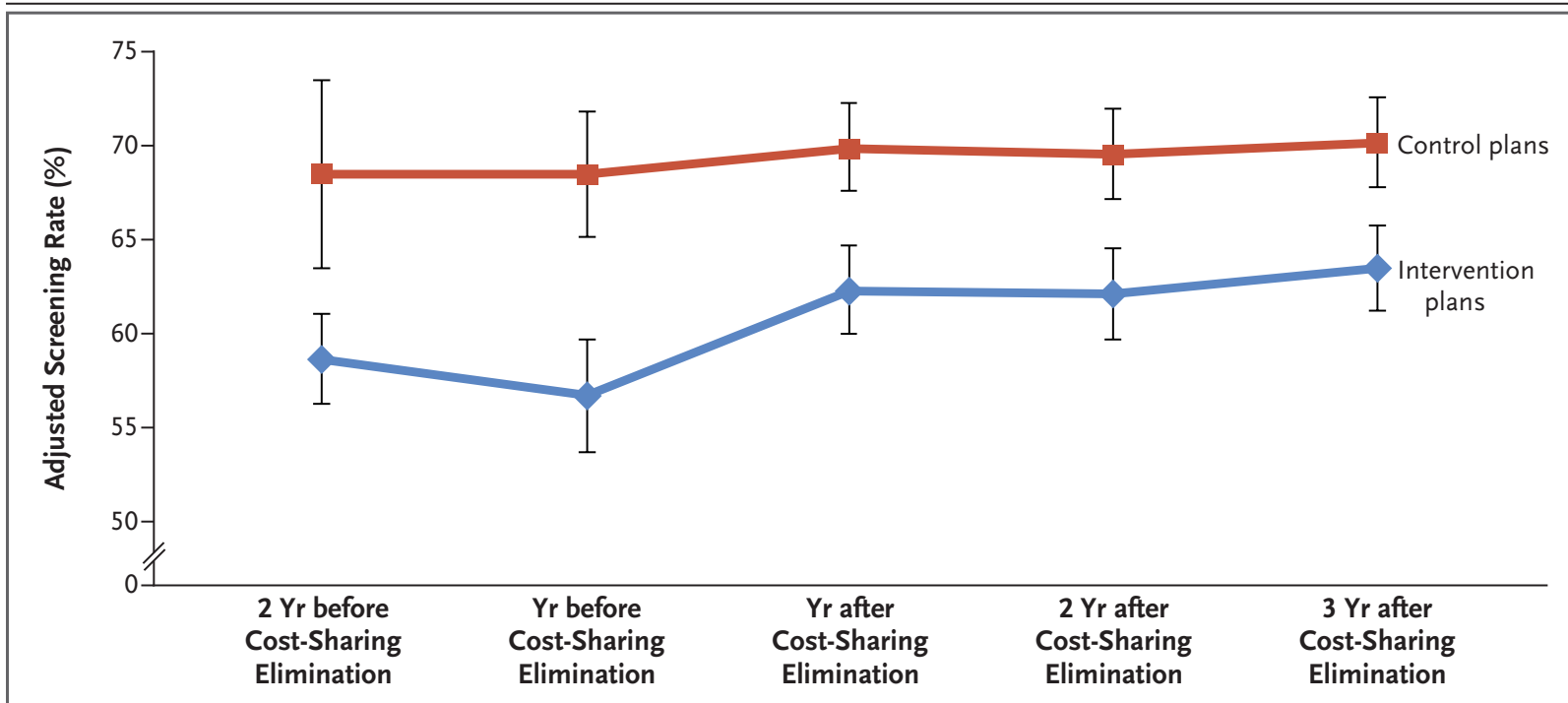
**↑↑ 5.7 percentage points**  
**(95% CI, 3.0-8.4)**

# Year of Cost Sharing Elimination

**Table 2.** Changes in Adjusted Rates of Biennial Screening for Breast Cancer.\*

Plans	No. of Plans	No. of Observations	Rate of Screening (95% CI)		Difference in Differences (95% CI)
			2-Yr Period before Cost-Sharing Elimination	2-Yr Period after Cost-Sharing Elimination	
			<i>percent</i>		<i>percentage points</i>
All plans					
Intervention plans	24	15,841	59.9 (54.9 to 65.0)	65.4 (61.8 to 69.0)	5.7 (3.0 to 8.4)
Control plans	48	60,119	73.1 (69.2 to 77.0)	72.8 (69.7 to 76.0)	
Eliminated cost sharing in 2009					
Intervention plans	17	13,265	57.5 (52.3 to 62.6)	62.9 (59.3 to 66.5)	5.4 (2.3 to 8.5)
Control plans	34	30,020	70.4 (67.5 to 73.3)	70.3 (67.7 to 73.0)	(2009)
Eliminated cost sharing in 2010					
Intervention plans	4	1,696	63.3 (55.1 to 71.5)	68.2 (62.3 to 74.0)	6.8 (1.3 to 12.3)
Control plans	8	11,370	73.5 (67.8 to 79.2)	71.6 (66.4 to 76.8)	(2010)
Eliminated cost sharing in 2011					
Intervention plans	3	880	55.2 (47.5 to 62.9)	66.4 (64.1 to 68.7)	5.8 (-3.7 to 15.4)
Control plans	6	18,729	72.3 (66.5 to 78.4)	77.7 (74.1 to 81.3)	(2011)

# Trends Over Time

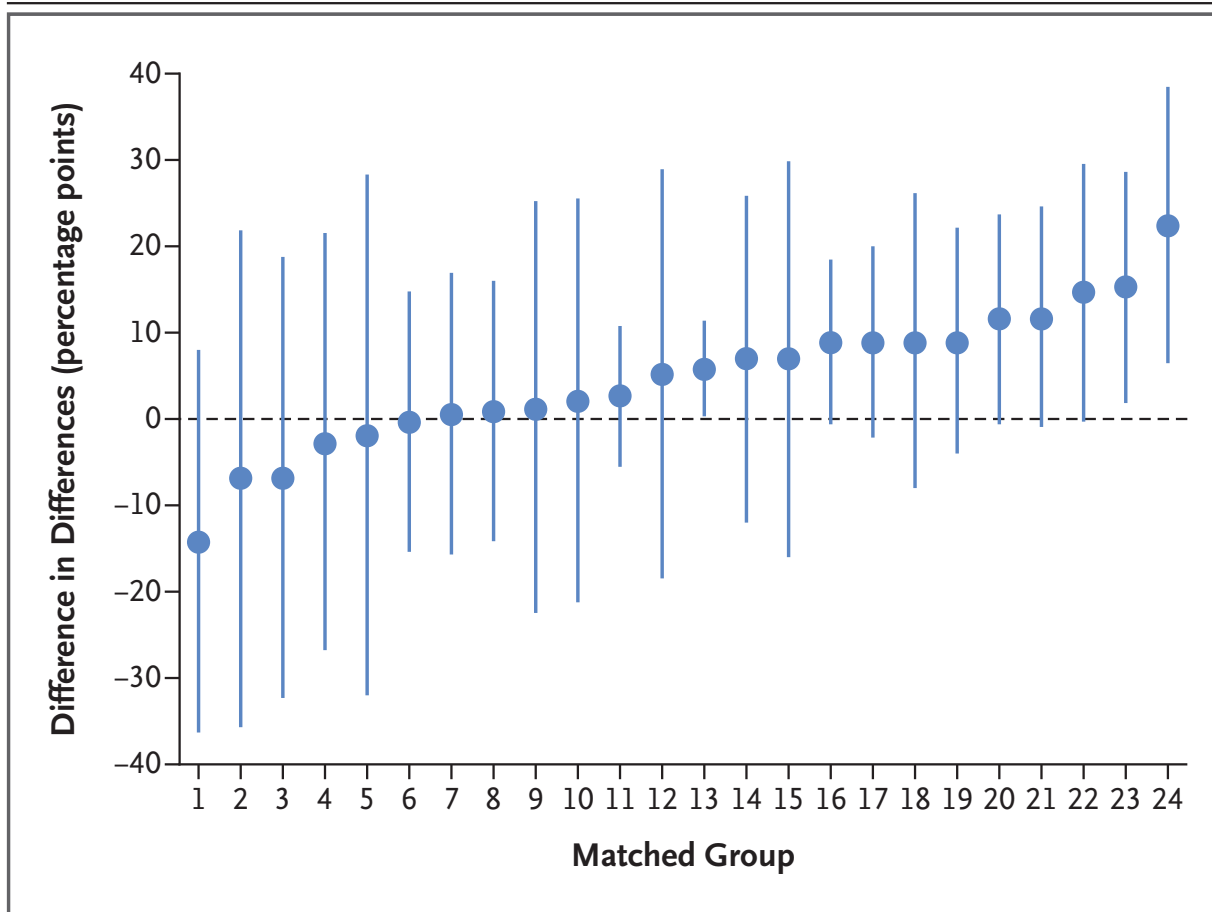


Screening rates in intervention plans declined significantly during the 2 years before cost-sharing elimination and then increased significantly after cost-sharing elimination.

**Figure 1.** Trends in Adjusted Rates of Biennial Screening Mammography in Intervention and Control Plans.

Intervention plans were 24 Medicare Advantage plans that eliminated cost sharing for mammography, and control plans were 48 matched Medicare Advantage plans that maintained full coverage of mammography.

# Differences in Matched Group



**Figure 2.** Adjusted Difference-in-Differences Estimates for Rates of Biennial Screening Mammography across 24 Matched Groups of Intervention and Control Plans.

Median difference-in-differences estimate was 6.0 percentage points

For 18 of the 24 groups, the difference-in-differences estimate was positive,

- increased rate of screening in the intervention plan as compared with the rates in matched control plans.

# Effects Across Subgroups

**Table 3.** Changes in Rates of Biennial Screening Mammography According to Race or Ethnic Group, Income, and Education.

Characteristic	Difference in Differences between Intervention and Control Plans (95% CI)
	<i>percentage points</i>
Race or ethnic group	
White	6.5 (3.7 to 9.4)
Black	8.4 (2.5 to 14.4)
Hispanic	0.4 (-7.3 to 8.1)
Income*	
Highest quartile of poverty	2.2 (-1.6 to 5.9)
Middle 50% of poverty	6.1 (1.8 to 10.5)
Lowest quartile of poverty	8.5 (4.5 to 12.5)
Education†	
Highest quartile of educational attainment	9.8 (4.5 to 15.2)
Middle 50% of educational attainment	4.7 (2.1 to 7.3)
Lowest quartile of educational attainment	4.3 (0.2 to 8.4)

Cost-sharing elimination was associated with increased screening rates in all income, education, and racial/ethnic subgroups

- except for Hispanic women

Effects were not different across each subgroup

- except education

# Conclusions

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1. Cost-sharing elimination resulted in **rates of screening mammography increasing by 6 percentage points**
2. The increases **occurred during the immediate 2-year period after cost sharing was eliminated.**
3. Attenuated effects among women living in areas with lower educational attainment
4. Negligible effects among Hispanic women.



# Value-based Insurance Design: Case Studies

## High-Value Care

Cost-sharing  
Elimination



Breast Cancer  
Screening Rates

## Low-Value Care

Insurer's  
Incentives



Use of Low-  
Value Services

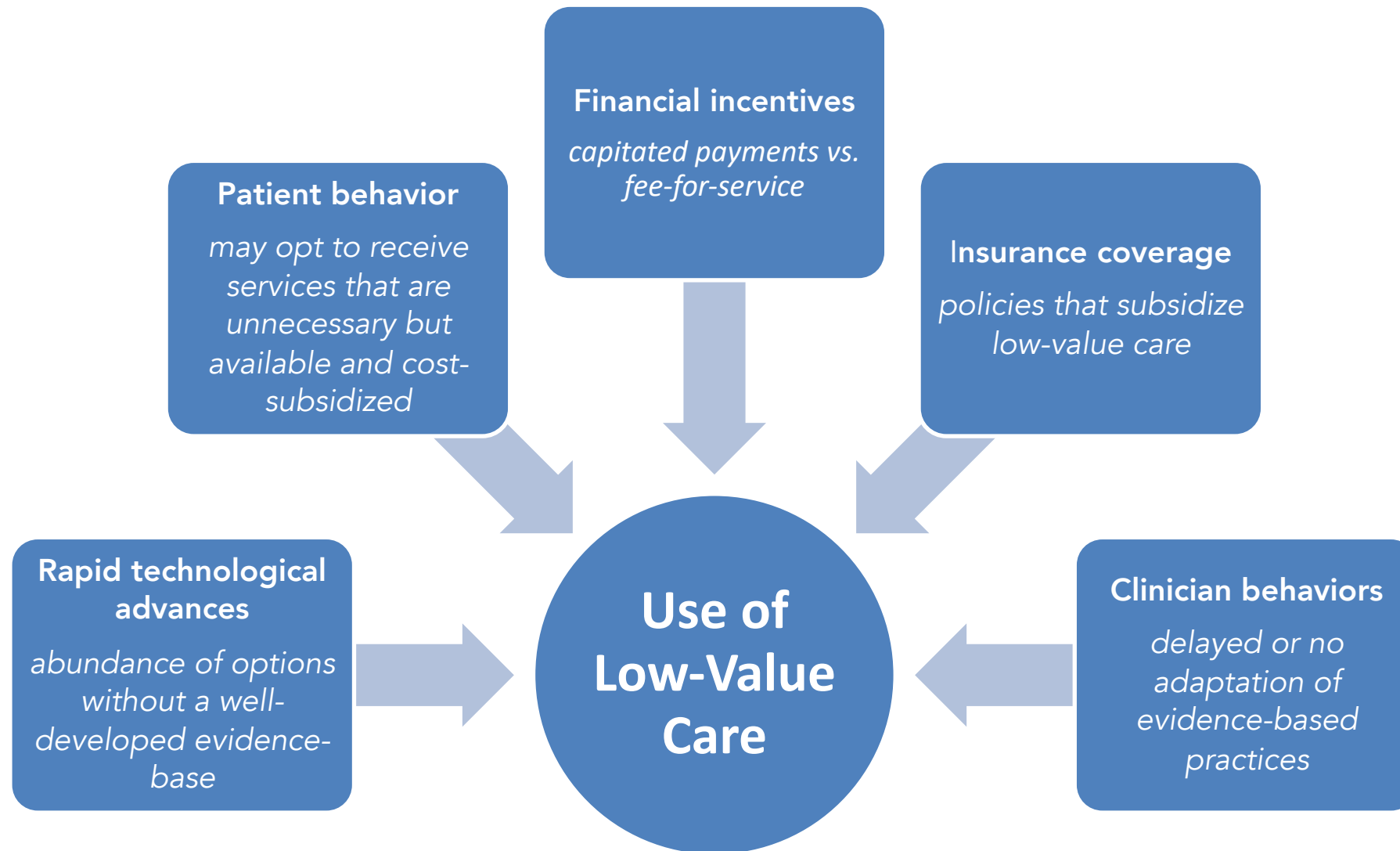
# Low-Value Care

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- Patient care that provides no net health benefit in specific clinical scenarios
  - early diagnostic imaging for uncomplicated low-back pain
  - PSA screening
  - cervical cancer screening > 65 years of age
  
- May even cause harm

# A Multifactorial Problem



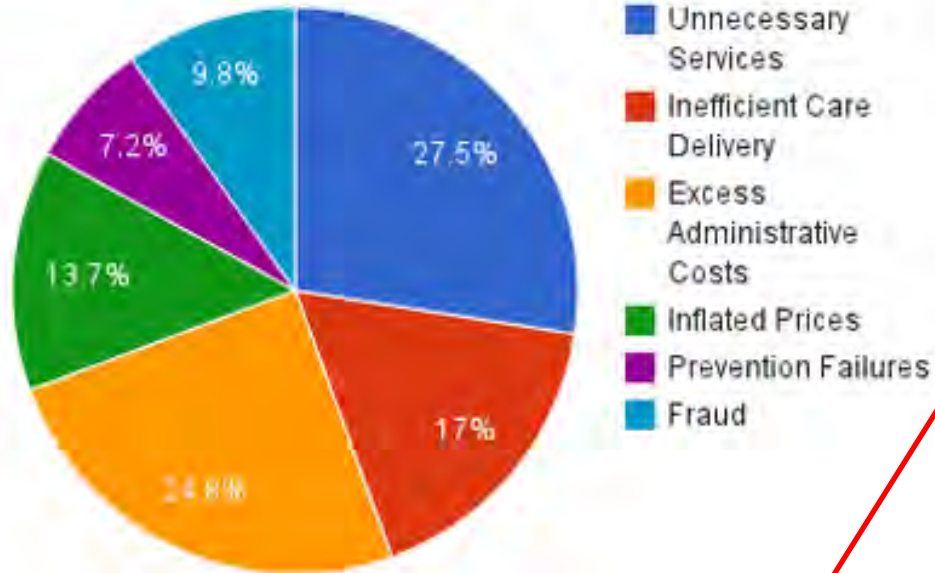
# Harms Due to Low-Value Care

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- Physical harms
  - e.g. overexposure to radiation through unnecessary imaging
- Emotional harms
  - worry and anxiety due to (false-) positives
- Financial harms

# Economic Consequences

## Low-Value Care Accounts for ~ 1/3 of U.S Health Care Spending



**Unnecessary services**

**\$210 billion annually**

TABLE S-1 Estimated Sources of Excess Costs in Health Care (2009)

Category	Sources	Estimate of Excess Costs
Unnecessary Services	<ul style="list-style-type: none"> <li>Overuse—beyond evidence-established levels</li> <li>Discretionary use beyond benchmarks</li> <li>Unnecessary choice of higher-cost services</li> </ul>	\$210 billion
Inefficiently Delivered Services	<ul style="list-style-type: none"> <li>Mistakes—errors, preventable complications</li> <li>Care fragmentation</li> <li>Unnecessary use of higher-cost providers</li> <li>Operational inefficiencies at care delivery sites</li> </ul>	\$130 billion
Excess Administrative Costs	<ul style="list-style-type: none"> <li>Insurance paperwork costs beyond benchmarks</li> <li>Insurers' administrative inefficiencies</li> <li>Inefficiencies due to care documentation requirements</li> </ul>	\$190 billion
Prices That Are Too High	<ul style="list-style-type: none"> <li>Service prices beyond competitive benchmarks</li> <li>Product prices beyond competitive benchmarks</li> </ul>	\$105 billion
Missed Prevention Opportunities	<ul style="list-style-type: none"> <li>Primary prevention</li> <li>Secondary prevention</li> <li>Tertiary prevention</li> </ul>	\$55 billion
Fraud	<ul style="list-style-type: none"> <li>All sources—payers, clinicians, patients</li> </ul>	\$75 billion

SOURCE: Adapted with permission from IOM, 2010.



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# Low-Value Care and Unnecessary Costs

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## COSTS & SPENDING

By John N. Mafi, Kyle Russell, Beth A. Bortz, Marcos Dachary, William A. Hazel Jr., and A. Mark Fendrick

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## DATAWATCH

# Low-Cost, High-Volume Health Services Contribute The Most To Unnecessary Health Spending

**DOI:** 10.1377/hlthaff.2017.0385  
HEALTH AFFAIRS 36,  
NO. 10 (2017): 1701-1704  
©2017 Project HOPE—  
The People-to-People Health  
Foundation, Inc.

# WasteCalculator

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- A given healthcare service is classified as:
  - high value
  - potentially low value
  - very likely low value

# Low-Value Care in VA

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- More than \$586 million, or \$9.90 per beneficiary per month, was spent unnecessarily on these low-value services, accounting for 2.1 per- cent of Virginia's total health care costs—which were about \$28 billion



# Most Low-Value Services Are Low-Cost

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- Virginia All Payer Claims Database (2014)
  - 93% of services used were low cost (\$100–\$538 per service) and very low cost (less than \$100) low-value services
  - 7% were high cost (\$539–\$1,315) and very high cost (more than \$1,315) low-value services

# Cost of Low-Value Care in VA

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## Cost: Low or Very Low (93% of LVC)

- \$381 million
- 65% of the total costs of low-value care

## Cost: High or Very High (7% of LVC)

- \$205 million
- 35% of the total costs of low-value care

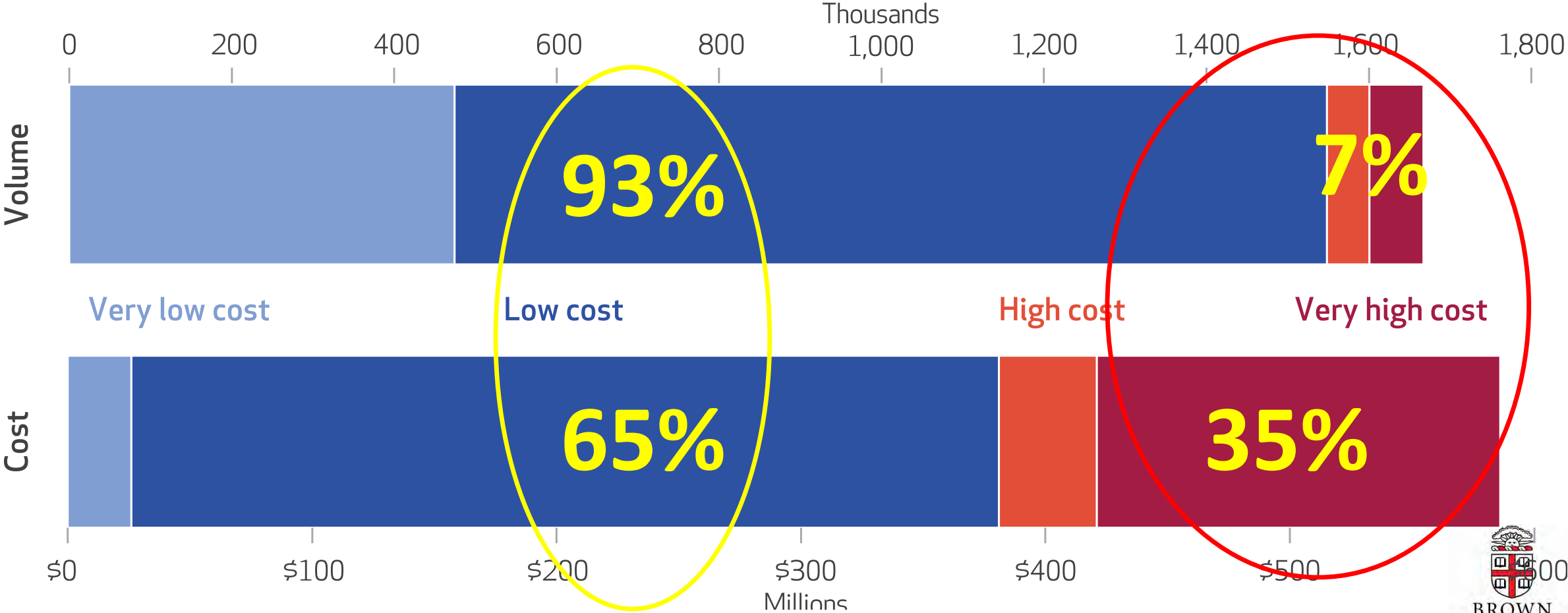
### Low-value care in VA accounts for:

More than \$586 million, or \$9.90 per beneficiary per month

2.1% of Virginia's total health care costs

# High Volume Low-Cost LVC Drives Costs

Use and cost of low-value services in Virginia in 2014, by quartiles of cost

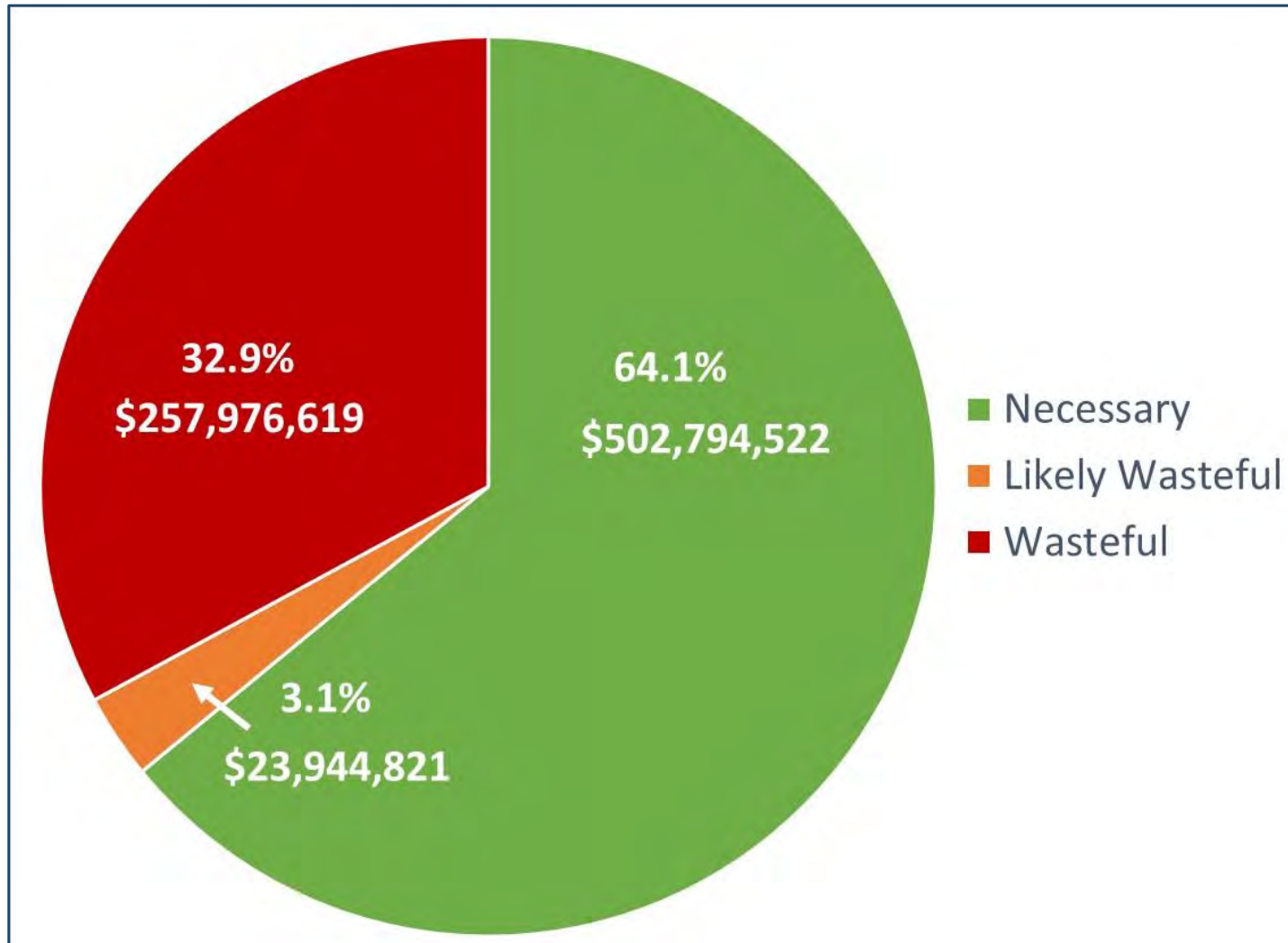


## The 10 most costly low-value services in Virginia, 2014

Low-value service	Mean cost per service <sup>a</sup>	Total unnecessary costs (millions) <sup>b</sup>	Total services measured	Services deemed low value	Ranking by use	Waste index <sup>c</sup>
Baseline lab tests for low risk patients having low-risk surgery	\$487	\$227.8	595,552	467,884	1	78.6%
Stress cardiac or other cardiac imaging in low-risk, asymptomatic patients	\$3,404	\$93.2	244,487	27,385	13	11.2%
Annual EKGs or other cardiac screening for low-risk, asymptomatic patients	\$298	\$41.0	2,823,557	137,666	5	4.9%
Routine head CT scans for ED visits for severe dizziness	\$1,569	\$24.6	29,816	15,724	15	52.7%
EKGs, chest x-rays, or pulmonary function tests in low-risk patients having low-risk surgery	\$646	\$21.3	33,754	32,900	11	97.5%
Population-based screening for vitamin D deficiency	\$125	\$20.6	165,034	165,031	4	100.0%
PSA-based screening for prostate cancer in all men, regardless of age	\$144	\$18.9	341,554	131,419	6	38.5%
Routine imaging for uncomplicated acute rhinosinusitis	\$2,365	\$17.1	14,196	7,220	19	50.9%
Routine annual cervical cancer screening in women ages 21–65	\$91	\$15.3	220,241	167,252	3	75.9%
Imaging for low-back pain within the first six weeks of symptom onset, in absence of red flags	\$330	\$13.9	48,857	42,110	9	86.2%



# Washington (State)



An estimated \$785 million was **SPENT** on services

An estimated **\$282 million (36%)** was spent on **low-value services**

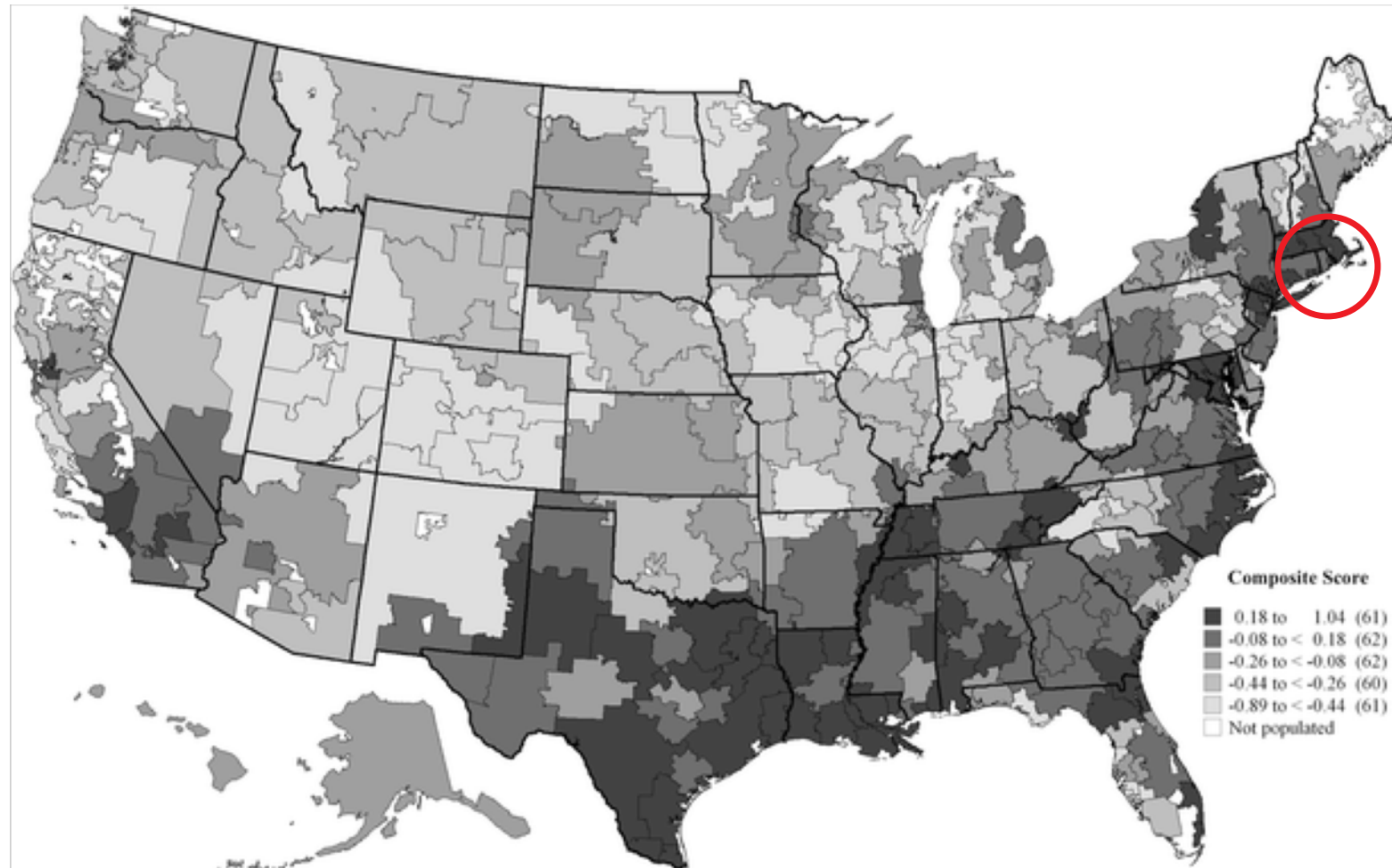
# Low-Value Care in RI

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- National-level analyses demonstrate substantial geographical variation in the use of low-value care across the U.S.
- In these analyses, Rhode Island (RI) stands out as one of the states with the **second highest rates** of low-value care.

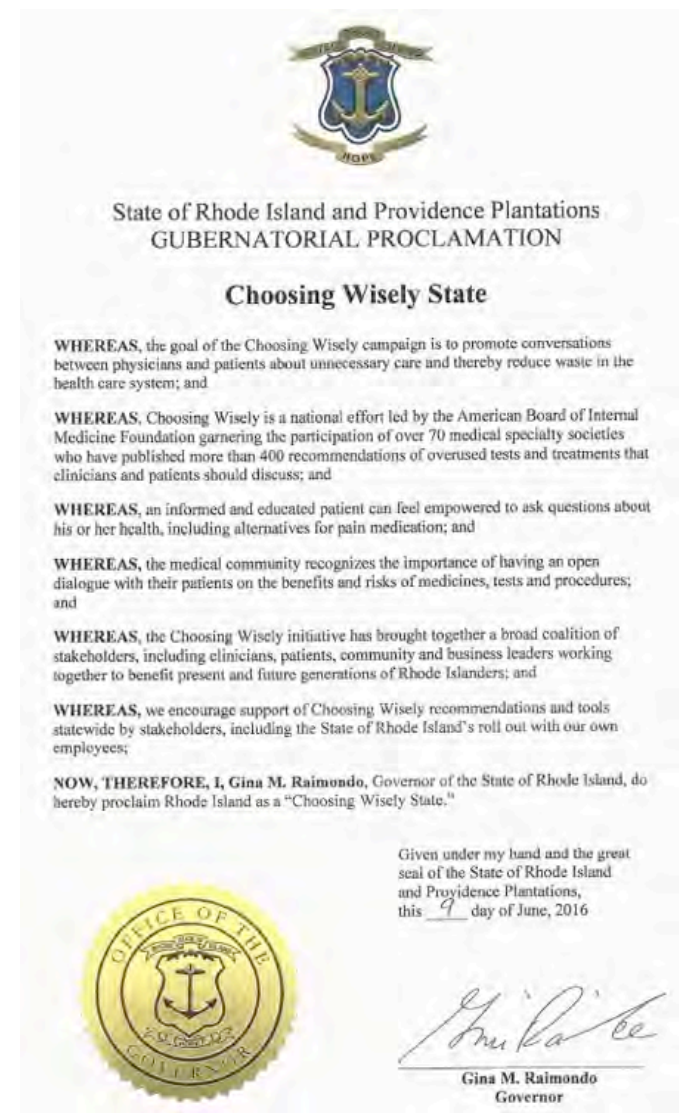
# Prevalence of Low-Value Care



Variation in the composite measure of Choosing Wisely test and treatment use, 2006-2011  
(N = 306 hospital referral regions)

# Combating Low-Value Care in RI

- *Choosing Wisely® State*
  - endorsed by the RI Business Group on Health; implementation initiatives
  - Gubernatorial Proclamation by the Governor





# Our Focus: Financial Incentives

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- Commercial insurers pay higher prices for healthcare services compared to public insurers (e.g. Medicare, Medicaid)



- Providers may be inclined to perform more services (including low-value care) to enrollees in commercial plans.



- Important implications arise for the sustainability of both public and private health insurance programs –

# Why Focus on Medicaid?

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- Medicaid, which is the largest public health insurer in the country covering 77 million people in 2017.
- In RI, the state government's Medicaid expenditures exceed \$2.3 billion.
- *(also practical reasons re: data availability)*

# Aims

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## 1. Determine the association between insurance type and low-value care in RI

*Hypothesis: Enrollment in commercial insurers will be associated with higher rates of low-value care*

## 2. Develop a predictive algorithm to identify the provision of low-value care

*Outcome: patient, provider, and payer characteristics predict a provider's probability to deliver low-value care*

# RI APCD ("HealthFacts RI")

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- Mandated by state legislation
- Jointly managed by
  - RI Executive Office of Health and Human Services
  - Department of Health
  - Office of the Health Insurance Commissioner
  - HealthSource RI

# RI APCD ("HealthFacts RI")

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- Large-scale, **administrative** database of de-identified healthcare claims, enrollment, and provider data from health insurers with more than 3,000 members.
- Data for **>1 million enrollees** in
  - traditional Medicare
  - Medicare Advantage (MA)
  - Medicaid
  - 9 largest commercial health insurers in RI
  - between 2011 and 2015

# Available Data

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- type of insurance and contract
- patient demographics (gender, age, ZIP code)
- diagnoses
- procedures
- medications (NDCs)
- service provider
- prescribing physician
- health plan payments
- member payment responsibility
- type and dates of bill paid
- facility type
- revenue codes
- service dates

# Indicators of Low-Value Care

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1. imaging for nonspecific low-back pain (LBP)
2. head imaging for uncomplicated headache
3. head imaging for syncope
4. imaging for plantar fasciitis
5. triiodothyronine tests for hypothyroidism
6. preoperative chest radiography
7. abdomen CT combined studies
8. simultaneous brain & sinus CT
9. CT for uncomplicated acute rhinosinusitis;
10. arthroscopic surgery for knee osteoarthritis
11. thorax CT combined studies
11. preoperative echocardiography
12. spinal injections for LBP
13. preoperative stress testing;
14. preoperative pulmonary function testing
15. electroencephalogram headache
16. cervical cancer screening for women aged >65 years
17. colorectal cancer screening for older elderly patients
18. prostate-specific antigen (PSA) testing for men aged >75 years

# Expected Outcomes – Aim 1

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- **Outcomes**

- association between insurance type and low-value care
- understand how financial incentives and insurance characteristics affect low-value

- **Rationale & Implications**

- inform the development of much-needed strategies to reduce low-value care in RI
- Inform the design of novel policies and payment models aimed at reducing low-value care (e.g. value-based insurance design)



# Expected Outcomes – Aim 2

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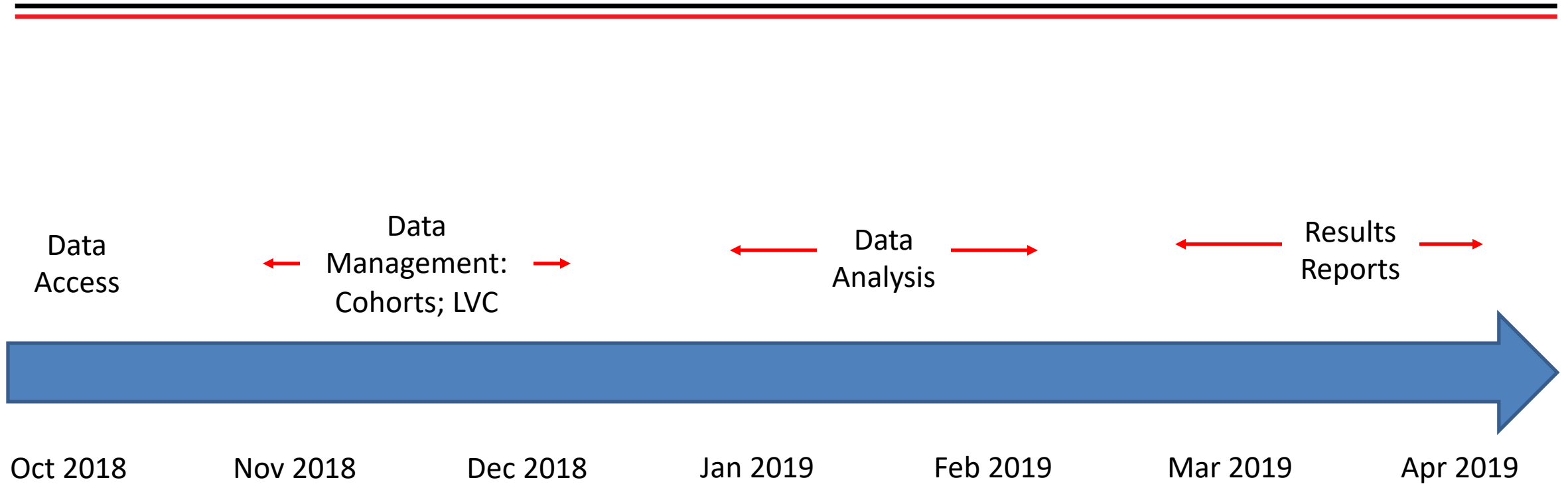
- **Outcomes**

- algorithm that identifies providers who have high probabilities of delivering low value care

- **Rationale & Implications**

- payers: influence, through incentives or selective contracting, the behaviors of providers who deliver low-value services
  - patients: select physicians that meet their needs (e.g. low rates of low-value care)

# Timelines



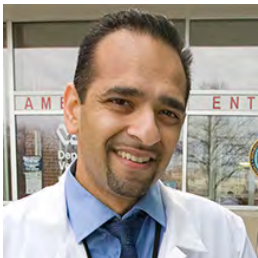
# Collaborators

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Director, Center for Evidence Synthesis in Health*



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*Associate Professor of Health Services, Policy & Practice, Brown University*



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*PhD Student in Health Services, Policy & Practice, Brown University*

# Thank you!

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Clinical  
Translational  
Research

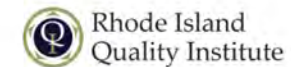
## Cite it & Submit it

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**U54GM115677**



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