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

Orestis A. Panagiotou, MD, PhD
Assistant Professor of Health Services, Policy & Practice
Brown University School of Public Health

orestis_panagiotou@brown.edu
@orpanag
Disclosures

- No conflicts of interest

- National Institute on Aging
  P01AG027296-07S1, R01AG044374-01

- National Institute of General Medical Sciences
  U54GM115677
Value-based Insurance Design (VBID)

- 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

<table>
<thead>
<tr>
<th>Grade</th>
<th>Definition</th>
<th>Suggestions for Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>The USPSTF recommends the service. There is high certainty that the net benefit is substantial.</td>
<td>Offer or provide this service.</td>
</tr>
<tr>
<td>B</td>
<td>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.</td>
<td>Offer or provide this service.</td>
</tr>
<tr>
<td>C</td>
<td>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.</td>
<td>Offer or provide this service for selected patients depending on individual circumstances.</td>
</tr>
<tr>
<td>D</td>
<td>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.</td>
<td>Discourage the use of this service.</td>
</tr>
<tr>
<td>I</td>
<td>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.</td>
<td>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.</td>
</tr>
</tbody>
</table>
Cost-Sharing Elimination in VBID

- 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

- 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?

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?

- 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”
Aims

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

- 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

- 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.)
Elimination of Cost Sharing for Screening Mammography

Changes in Rates of Biennial Screening Mammography

In intervention plans, rates of biennial screening mammography increased from 59.9% (95% confidence interval [CI], 54.9 to 65.0) in the 2-year period before cost sharing was eliminated to 65.4% (95% CI, 61.8 to 69.0) in the 2-year period after cost sharing was eliminated (Table 2). In control plans, the rates of biennial screening were 73.1% (95% CI, 69.2 to 77.0) in the prepolicy period and 72.8% (95% CI, 69.7 to 76.0) in the postpolicy period. The adjusted difference in differences between the intervention and control plans was 5.7 percentage points (95% CI, 3.0 to 8.4). In analyses stratified according to the year of cost-sharing elimination, we found adjusted difference-in-differences estimates of 5.4 percentage points (95% CI, 2.3 to 8.5) for the 17 plans that eliminated cost sharing in 2009, 6.8 percentage points (95% CI, 1.3 to 12.3) for the 4 plans that eliminated cost sharing in 2010, and 5.8 percentage points (95% CI, 3.7 to 15.4) for the 3 plans that eliminated cost sharing in 2011.

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

<table>
<thead>
<tr>
<th>Variable</th>
<th>Intervention Plans</th>
<th>Control Plans</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Yr Period before Cost-Sharing Elimination</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of unique enrollees</td>
<td>15,085</td>
<td>52,035</td>
</tr>
<tr>
<td>No. of observations</td>
<td>16,202</td>
<td>61,164</td>
</tr>
<tr>
<td>Age (yr)</td>
<td>67.6±1.2</td>
<td>67.8±1.2</td>
</tr>
<tr>
<td>Race or ethnic group (%)†</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>81</td>
<td>80</td>
</tr>
<tr>
<td>Black</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>Hispanic</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>ZIP Code–level characteristics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completed high school (%)‡</td>
<td>86</td>
<td>87</td>
</tr>
<tr>
<td>Below poverty level (%)§</td>
<td>16</td>
<td>15</td>
</tr>
</tbody>
</table>

* CI denotes confidence interval.

† Race and ethnic group were determined with the use of a validated algorithm. Percentages may not total 100 because of rounding.

‡ Data are the proportion of persons 65 years of age or older in the enrollee's ZIP Code who completed high school.

§ Data are the proportion of persons 65 years of age or older in the enrollee's ZIP Code with household income below the federal poverty limit.
Outcome

- 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

Before Cost-Sharing Elimination

Difference in rates of biennial screening in intervention vs. control plans

Cost-sharing elimination

After Cost-Sharing Elimination

Difference in rates of biennial screening in intervention vs. control plans
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.*

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

* CI denotes confidence interval.
† Race and ethnic group were determined with the use of a validated algorithm.16
‡ Data are the proportion of persons 65 years of age or older in the enrollee's ZIP Code who completed high school.
§ Data are the proportion of persons 65 years of age or older in the enrollee's ZIP Code with household income below the federal poverty limit.
Changes in Screening Rates

Rates of Biennial Screening Mammography

- **INTERVENTION PLANS**
  - Before cost sharing elimination: 59.9%
  - After cost sharing elimination: 65.4%

- **CONTROL PLANS**
  - Before cost sharing elimination: 73.1%
  - After cost sharing elimination: 72.8%
Effect Of Cost Sharing Elimination

Screening Rates

5.7 percentage points
(95% CI, 3.0-8.4)
Year of Cost Sharing Elimination

<table>
<thead>
<tr>
<th>Plans</th>
<th>No. of Plans</th>
<th>No. of Observations</th>
<th>Rate of Screening (95% CI)</th>
<th>Difference in Differences (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All plans</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intervention plans</td>
<td>24</td>
<td>15,841</td>
<td>59.9 (54.9 to 65.0)</td>
<td>65.4 (61.8 to 69.0)</td>
</tr>
<tr>
<td>Control plans</td>
<td>48</td>
<td>60,119</td>
<td>73.1 (69.2 to 77.0)</td>
<td>72.8 (69.7 to 76.0)</td>
</tr>
<tr>
<td>Eliminated cost sharing in 2009</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intervention plans</td>
<td>17</td>
<td>13,265</td>
<td>57.5 (52.3 to 62.6)</td>
<td>62.9 (59.3 to 66.5)</td>
</tr>
<tr>
<td>Control plans</td>
<td>34</td>
<td>30,020</td>
<td>70.4 (67.5 to 73.3)</td>
<td>70.3 (67.7 to 73.0)</td>
</tr>
<tr>
<td>Eliminated cost sharing in 2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intervention plans</td>
<td>4</td>
<td>1,696</td>
<td>63.3 (55.1 to 71.5)</td>
<td>68.2 (62.3 to 74.0)</td>
</tr>
<tr>
<td>Control plans</td>
<td>8</td>
<td>11,370</td>
<td>73.5 (67.8 to 79.2)</td>
<td>71.6 (66.4 to 76.8)</td>
</tr>
<tr>
<td>Eliminated cost sharing in 2011</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intervention plans</td>
<td>3</td>
<td>880</td>
<td>55.2 (47.5 to 62.9)</td>
<td>66.4 (64.1 to 68.7)</td>
</tr>
<tr>
<td>Control plans</td>
<td>6</td>
<td>18,729</td>
<td>72.3 (66.5 to 78.4)</td>
<td>77.7 (74.1 to 81.3)</td>
</tr>
</tbody>
</table>

* CI denotes confidence interval.

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

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.

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

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

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

- 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

Use of Low-Value Care

- Financial incentives: capitated payments vs. fee-for-service
- Insurance coverage: policies that subsidize low-value care
- Clinician behaviors: delayed or no adaptation of evidence-based practices
- Patient behavior: may opt to receive services that are unnecessary but available and cost-subsidized
- Rapid technological advances: abundance of options without a well-developed evidence-base

Insurance coverage policies that subsidize low-value care

Financial incentives: capitated payments vs. fee-for-service

Clinician behaviors: delayed or no adaptation of evidence-based practices

Rapid technological advances: abundance of options without a well-developed evidence-base

Patient behavior: may opt to receive services that are unnecessary but available and cost-subsidized
Harms Due to Low-Value Care

- 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

- Overuse—beyond evidence-established levels
- Discretionary use beyond benchmarks
- Unnecessary choice of higher-cost services

$210 billion annually

Inefficiently Delivered Services

- Mistakes—errors, preventable complications
- Care fragmentation
- Unnecessary use of higher-cost providers
- Operational inefficiencies at care delivery sites

$130 billion

Excess Administrative Costs

- Insurance paperwork costs beyond benchmarks
- Insurers’ administrative inefficiencies
- Inefficiencies due to care documentation requirements

$190 billion

Prices That Are Too High

- Service prices beyond competitive benchmarks
- Product prices beyond competitive benchmarks

$105 billion

Missed Prevention Opportunities

- Primary prevention
- Secondary prevention
- Tertiary prevention

$55 billion

Fraud

- All sources—payers, clinicians, patients

$75 billion

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

<table>
<thead>
<tr>
<th>Category</th>
<th>Sources</th>
<th>Estimate of Excess Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unnecessary Services</td>
<td>• Overuse—beyond evidence-established levels</td>
<td>$210 billion</td>
</tr>
<tr>
<td></td>
<td>• Discretionary use beyond benchmarks</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Unnecessary choice of higher-cost services</td>
<td></td>
</tr>
<tr>
<td>Inefficiently Delivered Services</td>
<td>• Mistakes—errors, preventable complications</td>
<td>$130 billion</td>
</tr>
<tr>
<td></td>
<td>• Care fragmentation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Unnecessary use of higher-cost providers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Operational inefficiencies at care delivery sites</td>
<td></td>
</tr>
<tr>
<td>Excess Administrative Costs</td>
<td>• Insurance paperwork costs beyond benchmarks</td>
<td>$190 billion</td>
</tr>
<tr>
<td></td>
<td>• Insurers’ administrative inefficiencies</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Inefficiencies due to care documentation requirements</td>
<td></td>
</tr>
<tr>
<td>Prices That Are Too High</td>
<td>• Service prices beyond competitive benchmarks</td>
<td>$105 billion</td>
</tr>
<tr>
<td></td>
<td>• Product prices beyond competitive benchmarks</td>
<td></td>
</tr>
<tr>
<td>Missed Prevention Opportunities</td>
<td>• Primary prevention</td>
<td>$55 billion</td>
</tr>
<tr>
<td></td>
<td>• Secondary prevention</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Tertiary prevention</td>
<td></td>
</tr>
<tr>
<td>Fraud</td>
<td>• All sources—payers, clinicians, patients</td>
<td>$75 billion</td>
</tr>
</tbody>
</table>

SOURCE: Adapted with permission from IOM, 2010.
Low-Value Care and Unnecessary Costs

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

A. Mark Fendrick

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

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

DataWatch

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

- A given healthcare service is classified as:
  - high value
  - potentially low value
  - very likely low value
Low-Value Care in VA

- 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

- 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

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

An analysis of data for 2014 about forty-four low-value health services in the Virginia All Payer Claims Database revealed more than $586 million in unnecessary costs. Among these low-value services, those that were low and very low cost ($538 or less per service) were delivered far more frequently than services that were high and very high cost ($539 or more). The combined costs of the former group were nearly twice those of the latter (65 percent versus 35 percent).

A substantial proportion of health care costs in the United States is allocated to low-value care, defined as patient care that provides no net health benefit in specific clinical scenarios—such as early diagnostic imaging for uncomplicated low-back pain. Despite decades of attention to this issue, US expenditures on low-value care persist. While many studies have focused on high-cost low-value services, such as arthroscopic knee surgery for osteoarthritis, few have examined which low-value services contribute the most to unnecessary costs. A better understanding of the distribution and costs associated with low-value care would inform ongoing efforts to reduce its provision.

Using 2014 data from the Virginia All Payer Claims Database, we determined that 93 percent of services used were low cost ($100–$538 per service) and very low cost (less than $100) low-value services, compared to 7 percent that were high cost ($539–$1,315) and very high cost (more than $1,315) low-value services (Exhibit 1). The total cost for low- and very-low-cost services was nearly twice the total cost for high- and very-high-cost services (65 percent versus 35 percent).

Exhibit 1
Use and cost of low-value services in Virginia in 2014, by quartiles of cost

<table>
<thead>
<tr>
<th>Cost</th>
<th>Volume</th>
<th>Cost</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0</td>
<td>7%</td>
<td>$500</td>
<td>35%</td>
</tr>
<tr>
<td>$100</td>
<td></td>
<td>$400</td>
<td></td>
</tr>
<tr>
<td>$200</td>
<td>65%</td>
<td>$300</td>
<td></td>
</tr>
<tr>
<td>$300</td>
<td></td>
<td>$200</td>
<td></td>
</tr>
<tr>
<td>$400</td>
<td></td>
<td>$100</td>
<td></td>
</tr>
<tr>
<td>$500</td>
<td>93%</td>
<td>$0</td>
<td></td>
</tr>
</tbody>
</table>

NOTE: “Low-value services” refers to forty-four specific health services in specific clinical settings from which the patient is expected to receive no net benefit. The costs for the quartiles of low-value services are less than $100 per very-low-cost service, $100–$538 per low-cost service, $539–$1,315 per high-cost service, and more than $1,315 per very-high-cost service. Costs are the average (mean) amount of money per service paid to a health care provider across all payers, including patients’ out-of-pocket spending, multiplied by the frequency of that service.
Using a large, statewide compendium of information about virtually all public and private insurance beneficiaries in Virginia, we analyzed forty-four low-value services to better identify specific clinical scenarios in which unnecessary costs occurred. An algorithm-driven software program analyzed 5.4 million health care services and found that 1.7 million of them were low value—which cost more than $586 million (2.1 percent of Virginia’s health care costs).

Contrary to common belief, low- and very-low-cost low-value services (those costing less than $539 per service) were administered more than thirteen times more frequently than costlier low-value services. Although higher-cost low-value services are frequently showcased in policy deliberations and the media, lower-cost low-value services (those in the bottom two quartiles of our study) accounted for almost twice as much unnecessary cost as did services in the top two quartiles.

The cost distribution of low-value care should have important implications for policy makers, health care systems, and clinicians struggling to find better ways to reduce unnecessary costs without disappointing patients, disrupting practice norms, or reducing the quality of or access to care. Demonstrating the relative excessive use and costs of low-value services is particularly salient because these findings should indicate a pragmatic path to begin their reduction. Although changing any physician practice pattern (including the delivery of routine and low-cost services) is notoriously difficult, even a modest decrease in the use of low- and very-low-cost low-value services could lead to savings and serve as a feasible strategy for catalyzing a broader movement to tackle low-value care. A focus on reducing low- and very-low-cost services is likely to be less controversial than a policy that targets high- and very-high-cost services, because the former strategy would not present a financial threat to any particular clinical specialty or advocacy group.

The 2.1 percent of total statewide costs identified as unnecessary in this study might seem relatively small compared with previous estimates that 10–30 percent of health care costs are unnecessary. However, it is important to note that our cost estimates are conservative because they do not capture the downstream costs associated with low-value care. For example, an abnormal cardiac stress test in an asymptomatic, low-risk patient can lead to a low-value cardiac catheterization. Moreover, the services we analyzed do not capture the costs and use of all low-value care. Rather, they were chosen because they were most amenable to claims analysis, and they do not include even costlier services.

### Exhibit 2

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

**SOURCE** Authors’ analysis of data for 2014 from the Virginia All Payer Claims Database.

**NOTES** "Low-value services" are defined in the Notes to Exhibit 1. EKG is electrocardiogram. CT is computed tomography scan. ED is emergency department. PSA is prostate specific antigen. aAverage (mean) amount of money per service paid to a health care provider across all payers (including patients’ out-of-pocket spending). bMean cost per service multiplied by total number of low-value services. cNumber of low-value services divided by the number of total services measured.
An estimated $785 million was spent on services

An estimated $282 million (36%) was spent on low-value services
Low-Value Care in RI

- 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

- 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?

- 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

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”)

- 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")

- 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

- 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

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
12. preoperative echocardiography
13. spinal injections for LBP
14. preoperative stress testing;
15. preoperative pulmonary function testing
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

- **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

- **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


Data Access  Data Management: Cohorts; LVC  Data Analysis  Results Reports
Collaborators

Tom Trikalinos, MD, PhD
Associate Professor of Health Services, Policy & Practice, Brown University
Director, Center for Evidence Synthesis in Health

Amal Trivedi, MD, MPH
Associate Professor of Health Services, Policy & Practice, Brown University

Shaun Forbes, BSBA, AM
PhD Student in Health Services, Policy & Practice, Brown University
Thank you!

- [orestis_panagiotou@brown.edu](mailto:orestis_panagiotou@brown.edu)