

THE  
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FOR HEALTH POLICY & CLINICAL PRACTICE

GEISEL SCHOOL OF MEDICINE AT DARTMOUTH

# Health Economics: Value-Based Benefits & Analytics

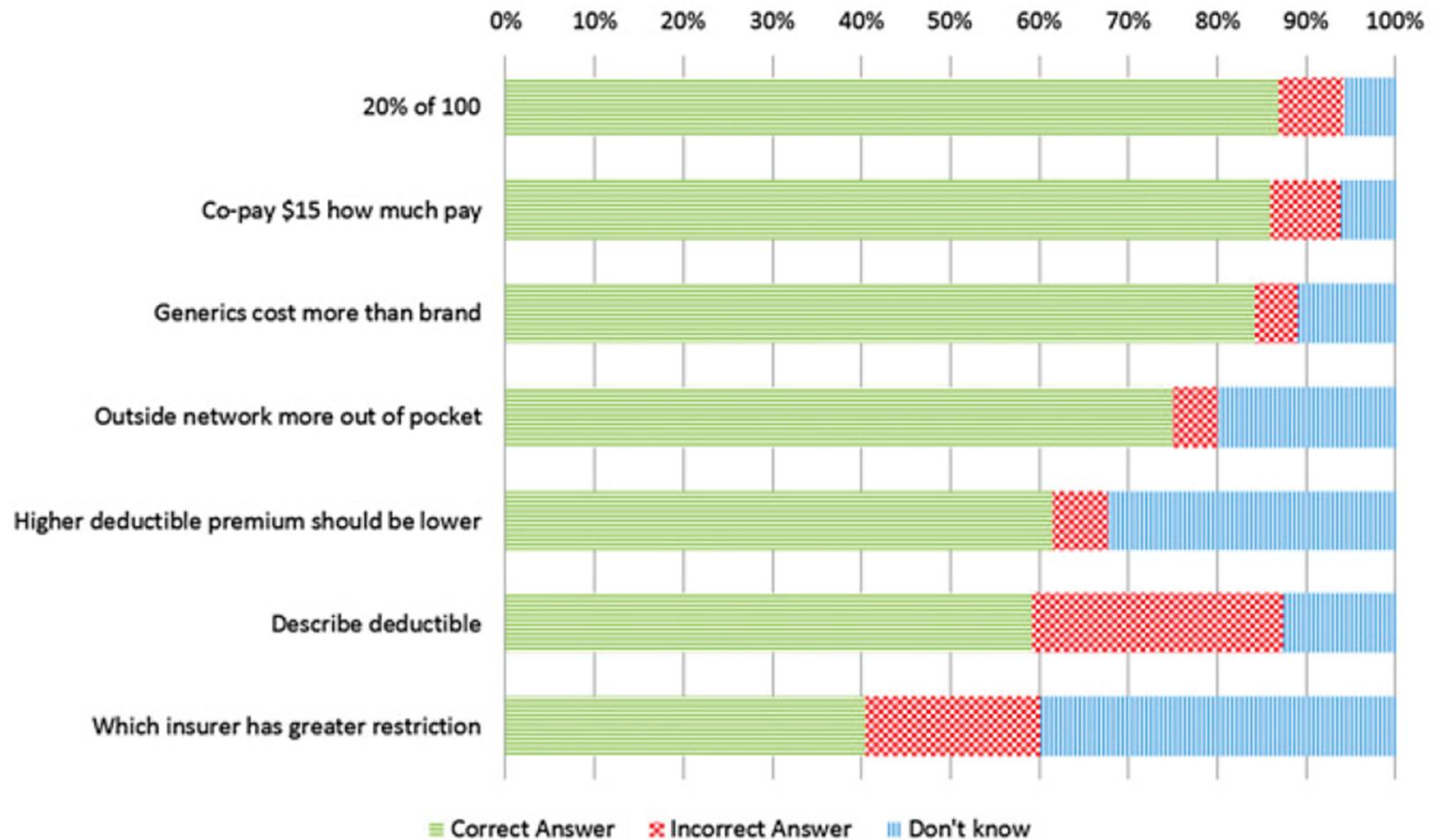
Vermont House Health Care Committee

Ellen Meara, PhD

MARCH 26, 2014

# Context

## Americans' (Lack of) Understanding of Health Insurance, 9/13



# Goals

1

There is a tradeoff between insurance and costs

2

Cost-sharing lowers health care spending

3

Cost-sharing has unintended consequences

# Goals

1

There is a tradeoff between insurance and costs

2

Cost-sharing lowers health care spending

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Cost-sharing has unintended consequences

## Tradeoff Between Insurance and Costs

Why do we want  
health insurance?

Protection in case of  
(major) illness/injury

How is health  
insurance different?

Not a one-time event  
like fires / accidents

## Tradeoff Between Insurance and Costs



# Goals

1

There is a tradeoff between insurance and costs

2

Cost-sharing lowers health care spending

3

Cost-sharing has unintended consequences

## Cost-Sharing Effects

How Has Cost-Sharing Been Used?

Deductible and Coinsurance

Copayment

Tiered Formularies

Value-Based Insurance Design

High Deductibles

## Cost-Sharing Effects

How Has Cost-Sharing Been Used?

Deductible and Coinsurance

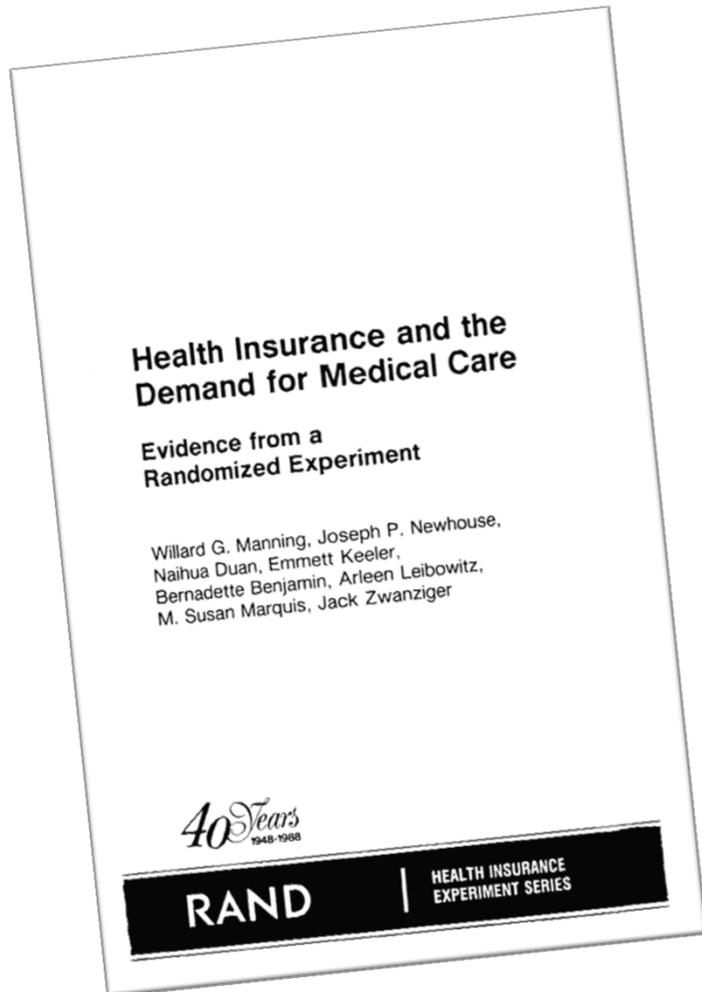
Copayment

Tiered Formularies

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# Cost-Sharing Effects: Deductible and Coinsurance

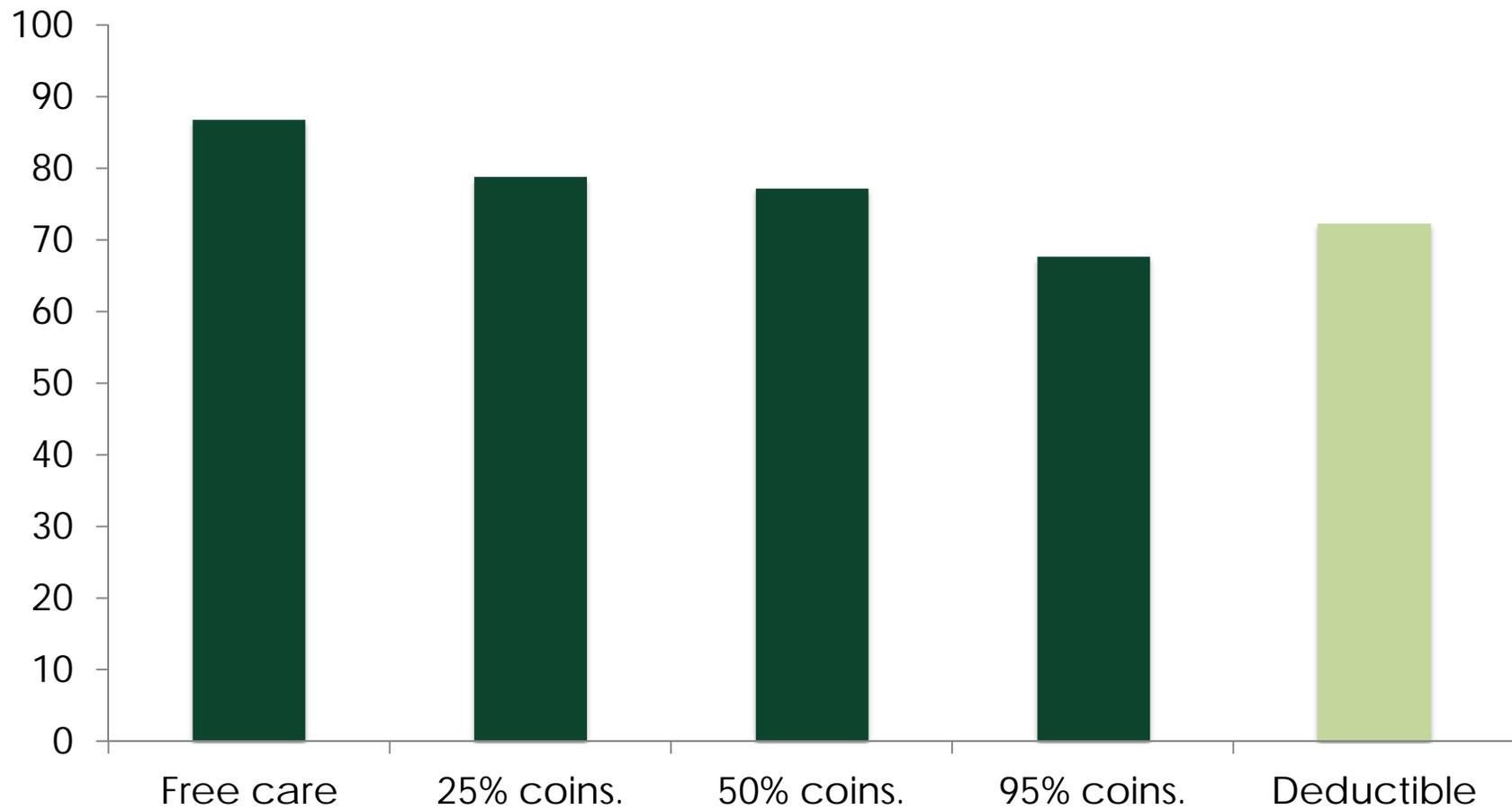


RAND Randomly Assigned 5,800 People

Plan (arm)	Coinsurance	Max Out-of-Pocket as % of Income	Deductible
Free Care	0%	NA	\$0
25%	25%	5%	\$0
50%	50%	10%	\$0
95%	95%	15%	\$0
Deductible	0%	NA	\$150 – single \$450 - family

# Cost-Sharing Effects: Deductible and Coinsurance

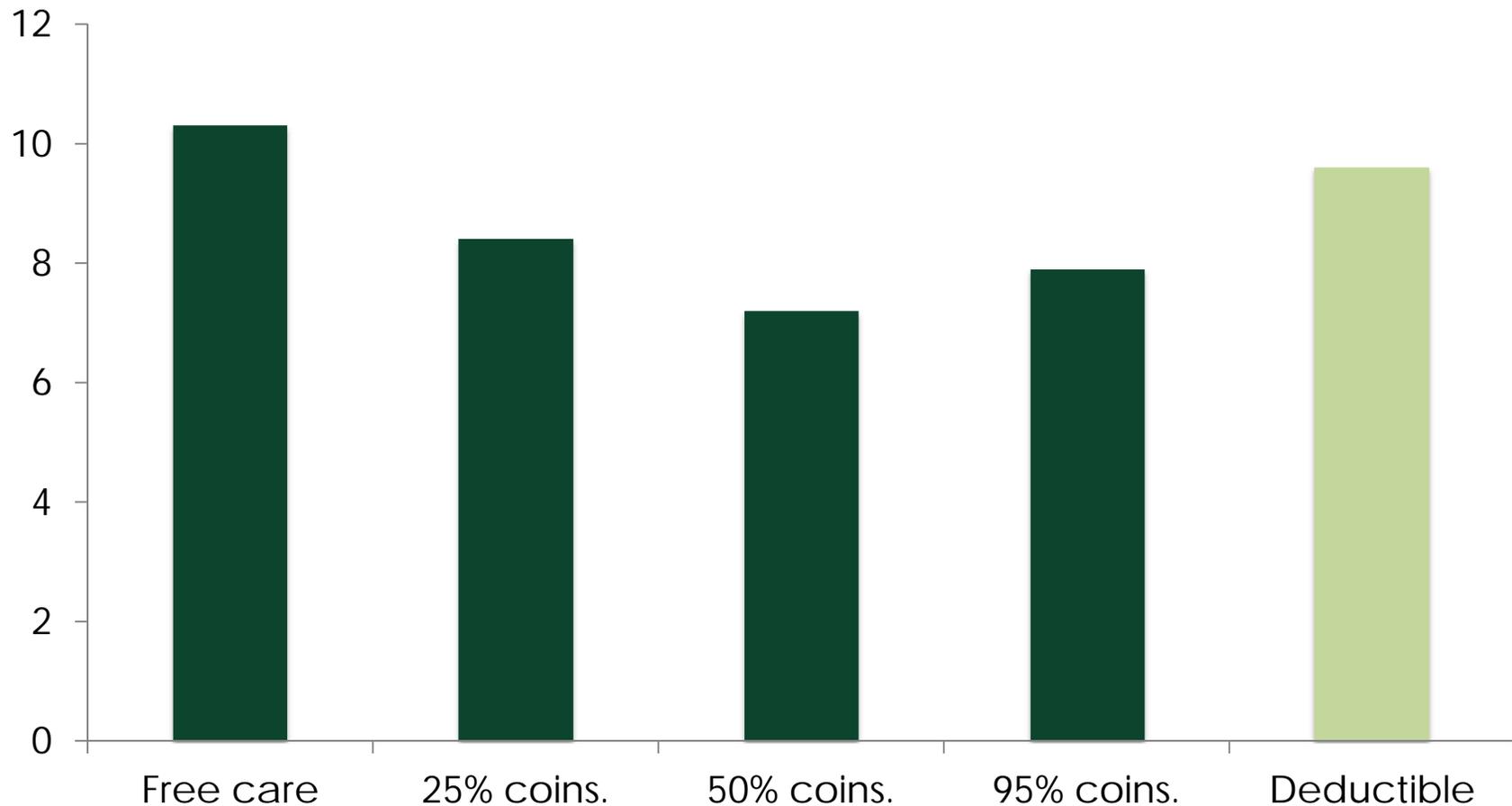
## Percent of Beneficiaries Getting Any Medical Care



p-value < .0001 for difference across plans

## Cost-Sharing Effects: Deductible and Coinsurance

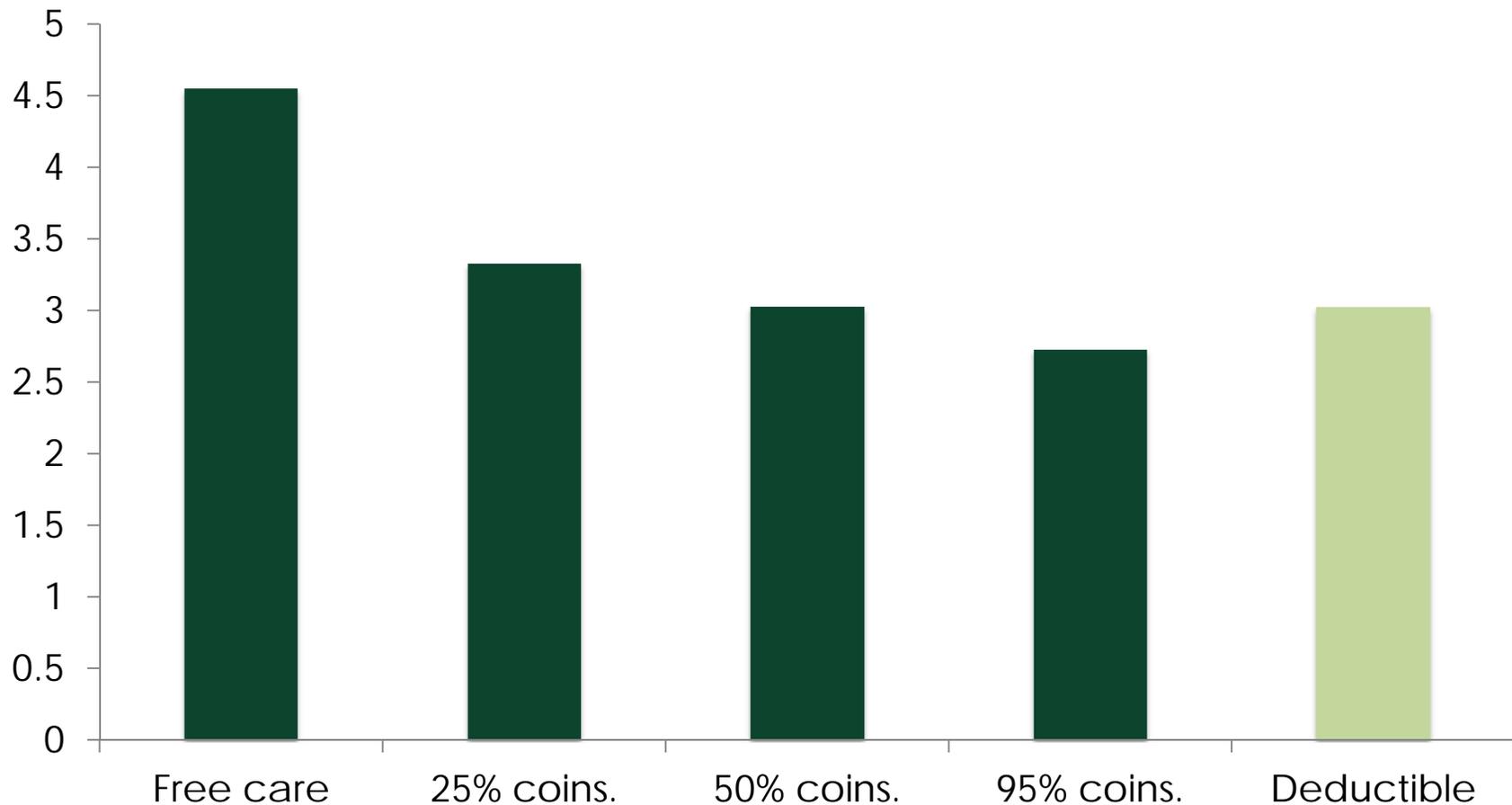
Percent of Beneficiaries with One or More Inpatient Admissions



p-value=.0006 for difference across plans

## Cost-Sharing Effects: Deductible and Coinsurance

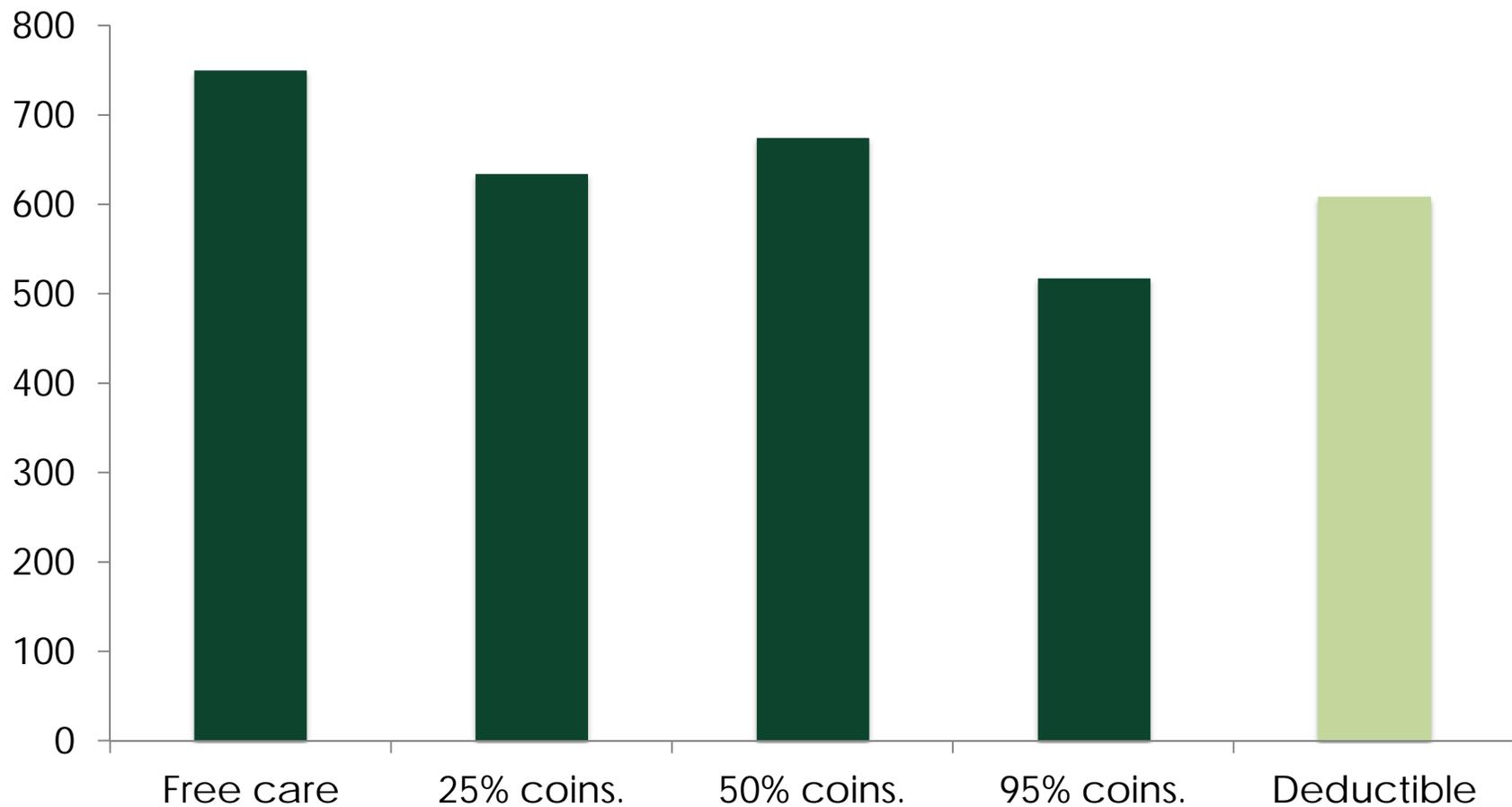
### Annual Number of Face-to-Face Visits Per Beneficiary



p-value < .0001 for difference across plans

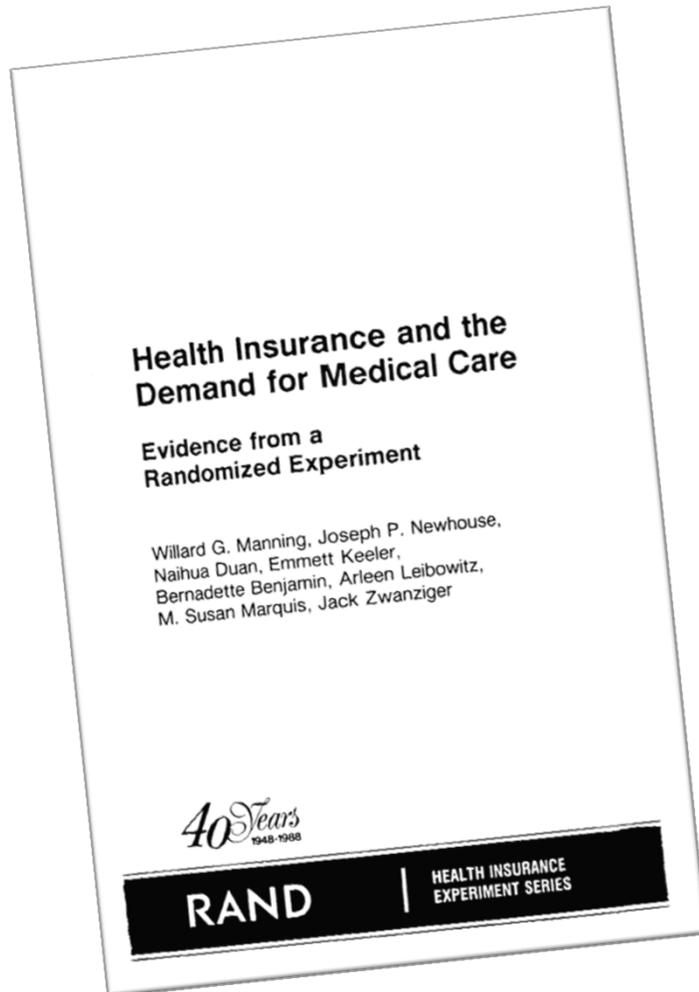
## Cost-Sharing Effects: Deductible and Coinsurance

### Total Annual Expenditures Per Beneficiary (1984 Dollars)



p-value=.003 for difference across plans

# Cost-Sharing Effects: Deductible and Coinsurance



## Utilization

Higher coinsurance reduces effective and ineffective care by same amount. A 10% rise in cost to patients led to 2% lower spending.

## Outcomes

Higher coinsurance does not affect health outcomes for healthy beneficiaries.

Low-income groups at-risk of illness had adverse effects.

## Cost-Sharing Effects

How Has Cost-Sharing Been Used?

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# Cost-Sharing Effects: Copayment

## Utilization

10% rise in price leads to 1.5% decline in utilization.

Reductions occurred for acute, chronic, other drugs.

## Outcomes

Hospitalizations went up (especially for sickest)

American Economic Review 2010, 100:1, 193-213  
<http://www.aeaweb.org/articles.php?doi=10.1257/aer.100.1.193>

### Patient Cost-Sharing and Hospitalization Offsets in the Elderly

By AMITABH CHANDRA, JONATHAN GRUBER, AND ROBIN MCKNIGHT\*

*In the Medicare program, increases in cost sharing by a supplemental insurer can exert financial externalities. We study a policy change that raised patient cost sharing for the supplemental insurer for retired public employees in California. We find that physician visits and prescription drug usage have elasticities that are similar to those of the RAND Health Insurance Experiment (HIE). Unlike the HIE, however, we find substantial "offset" effects in terms of increased hospital utilization. The savings from increased cost sharing accrue mostly to the supplemental insurer, while the costs of increased hospitalization accrue mostly to Medicare. (JEL G22, I12, I18, J14)*

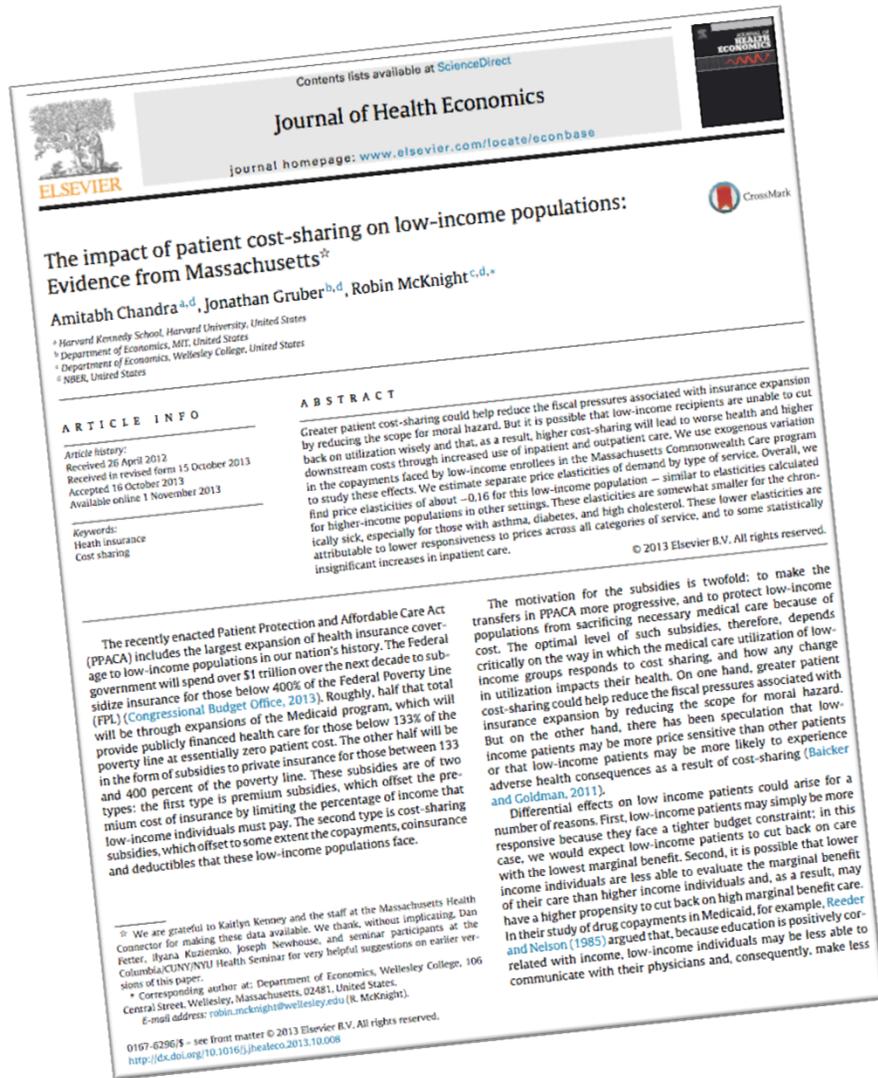
The elderly are the most intensive consumers of health care in the United States today. Individuals over age 65 consume 36 percent of health care in the US, despite representing only 13 percent of the population (Centers for Medicaid and Medicare Services 2005). The Medicare program that insures the nation's elderly (as well as the disabled) is the third largest expenditure item for the federal government, and is projected to exceed Social Security by 2024 (Centers for Medicaid and Medicare Services 2005a). This rapid growth in program expenditures was reinforced by the recent introduction of Medicare Part D, a new plan providing coverage for the outpatient prescription drugs used by Medicare beneficiaries.

The federal government has undertaken a variety of strategies to control Medicare program growth on the supply side, from the introduction of prospective reimbursement for hospitals to reductions in provider reimbursement rates. Yet Medicare spending growth has continued unabated. Recently, therefore, there has been a growing interest in demand-side approaches to controlling system costs, through higher patient costs which would induce more price sensitivity in medical spending.

Demand-side approaches, however, are complicated by the fact that Medicare beneficiaries are often covered by multiple insurers at once. Because Medicare already has quite substantial cost sharing, most enrollees have some form of supplemental coverage for their medical spending, provided by an employer, purchased on their own, or provided through state Medicaid programs. The incentives of the supplemental insurer and Medicare are not necessarily readily aligned.

\* Chandra: Kennedy School of Government, Harvard University, 79 JFK Street, Cambridge, MA 02138, and NBER (e-mail: Amitabh.Chandra@Harvard.edu); Gruber: Department of Economics, MIT, 50 Memorial Drive E52-355, Cambridge, MA 02142, and NBER (e-mail: gruber@mit.edu); McKnight: Department of Economics, Wellesley College, 106 Central Street, Wellesley, MA 02481, and NBER (e-mail: rmcknight@wellesley.edu). We are grateful to two anonymous referees for very helpful comments, Kathy Donneson and Terrence Newsome from CALPERS for the invaluable technical assistance, Dan Gottlieb and Weiping Zhou at Dartmouth Medical School for assistance with Medicare data, Drs. Dhruv Bansal, Phoutie Bansal, Julie Bynum, Amy Richardson, and Ivy Tiu for assisting with classification of prescription drugs, James deBenedetti, Michele Douglas, Will Manning, Doug Miller, April Omoto, Doug Staiger, and seminar participants at the Annual Health Economics Conference, the NBER, RAND, UC-Davis, University of Missouri, Wellesley College, and the Pharmaceutical Economics and Policy Council for helpful comments. Gruber acknowledges support from the Kaiser Family Foundation and the National Institute on Aging, and Chandra from NIA P01 AG19783-02, an NBER Aging Fellowship, and the Nelson Rockefeller Center at Dartmouth.

# Cost-Sharing Effects: Copayment



## Utilization

Higher copayments lead to decreased utilization.

## Outcomes

Higher copayments do not result in a hospital offset.

## Cost-Sharing Effects

How Has Cost-Sharing Been Used?

Deductible and Coinsurance

Copayment

Tiered Formularies

Value-Based Insurance Design

High Deductibles

# Cost-Sharing Effects: Tiered Formularies



## Utilization

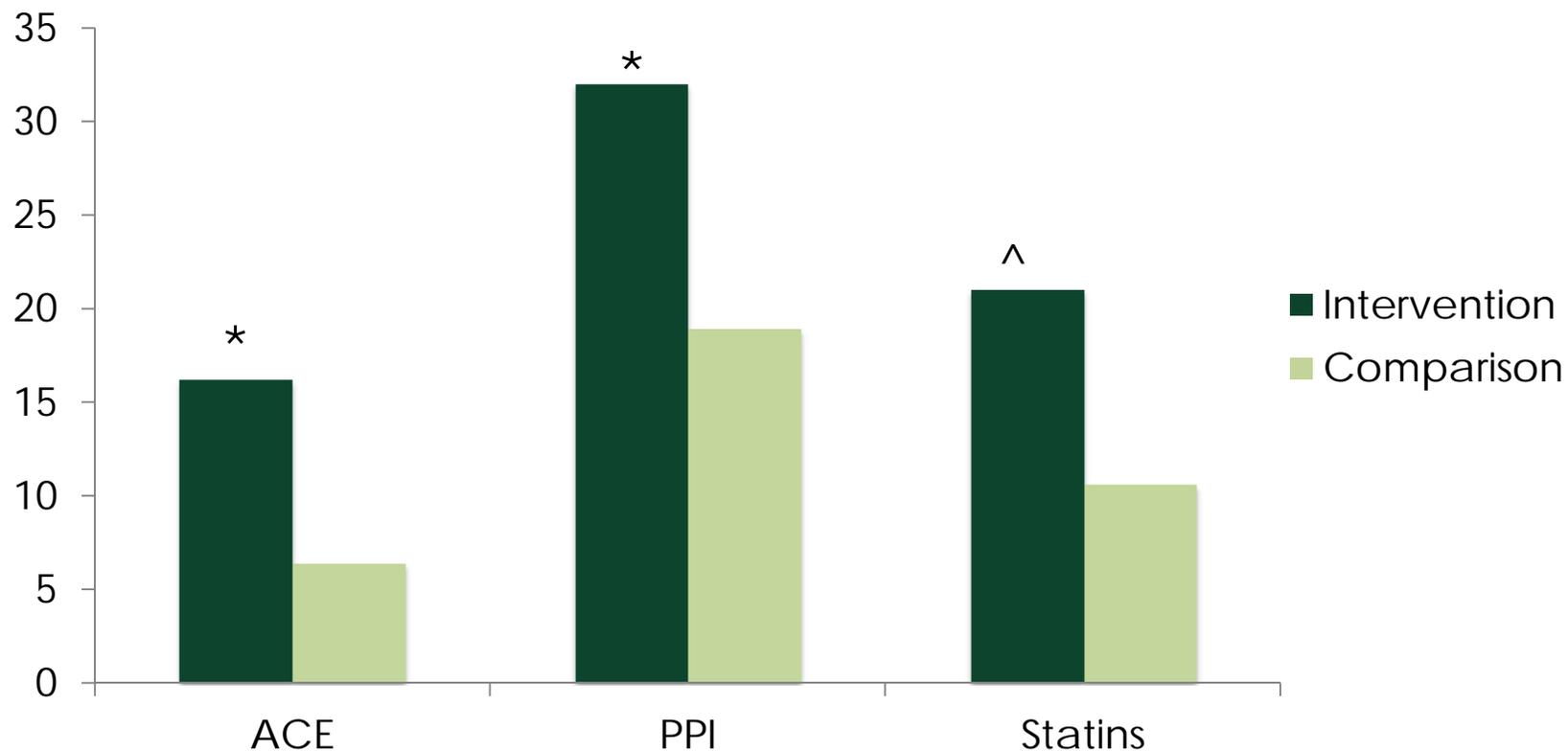
Drug spending declined, regardless of drug class.

## Outcomes

Some patients stopped altogether.

## Cost-Sharing Effects: Tiered Formularies

### Percent Discontinuing Use in Drug Class

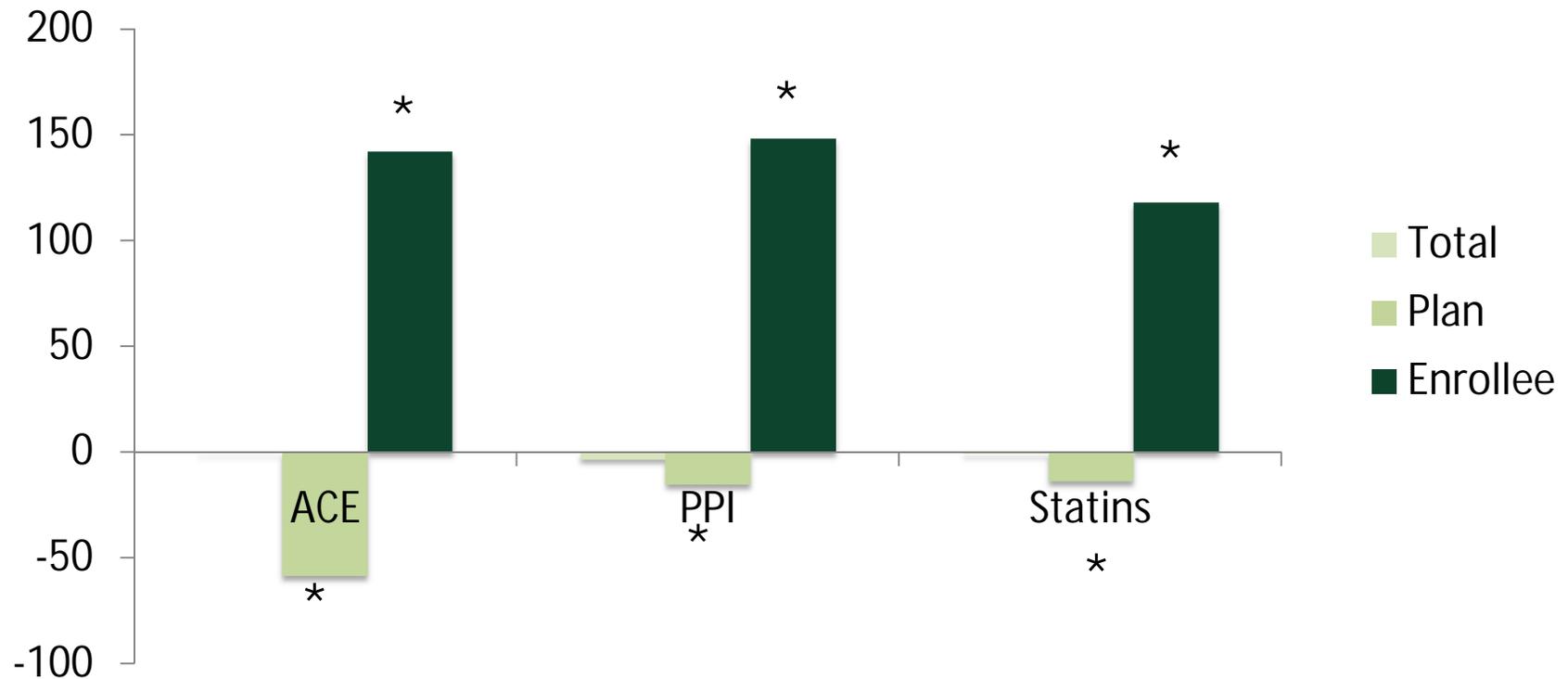


\* P < .0001 for difference between intervention & comparison groups

^ P = .04 for difference between intervention & comparison

## Cost-Sharing Effects: Tiered Formularies

### Percentage Point Change In Spending, Intervention – Control Group



\*P < .0001 for difference between intervention & comparison groups

## Cost-Sharing Effects

How Has Cost-Sharing Been Used?

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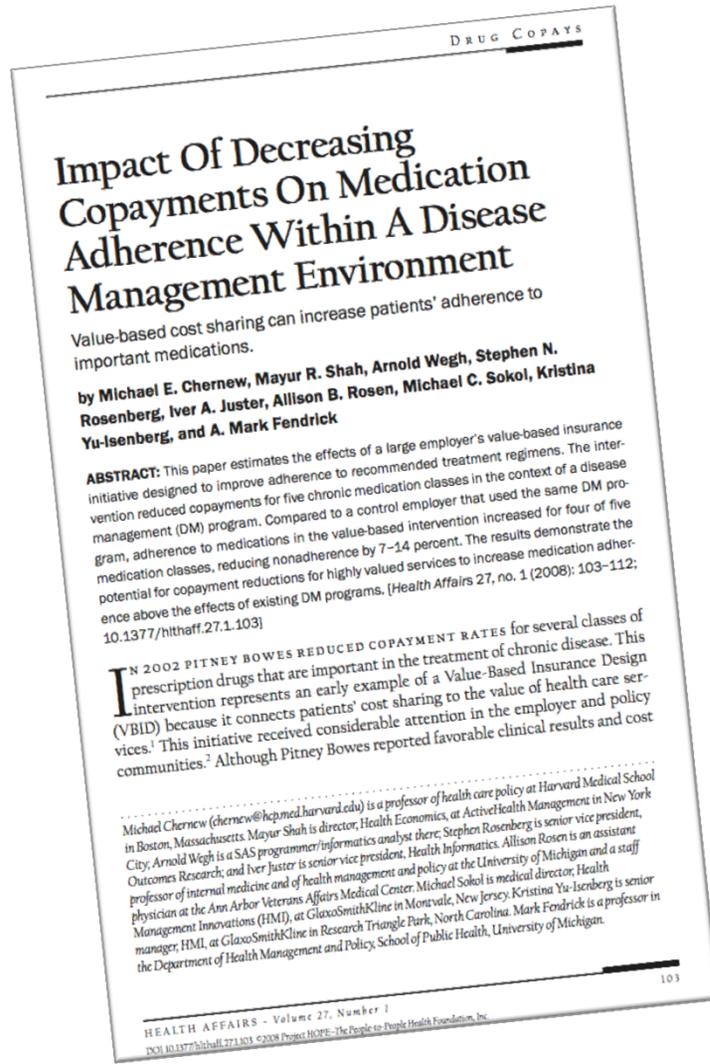
Copayment

Tiered Formularies

Value-Based Insurance Design

High Deductibles

# Cost-Sharing Effects: Value-Based Insurance Design



## Utilization

10% drop in price leads to 1-4% rise in Rx use

## Cost-Sharing Effects

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High Deductibles

# Cost-Sharing Effects: High Deductibles



## Utilization

Reduction in utilization overall,  
even for free preventive care

# Cost-Sharing Effects: High Deductibles

ORIGINAL CONTRIBUTION

## Emergency Department Use and Subsequent Hospitalizations Among Members of a High-Deductible Health Plan

J. Frank Wharam, MB, BCH, MPH  
Bruce E. Landon, MD, MBA  
Alison A. Galbraith, MD, MPH  
Ken P. Kleinman, ScD  
Stephen B. Soumerai, ScD  
Dennis Rose-Degman, ScD

**P**ATIENTS EVALUATED AT EMERGENCY departments often present with nonemergency conditions, an expensive practice that contributes to overcrowding and decreased continuity of care.<sup>1-8</sup> Evidence suggests that emergency department overcrowding is associated with adverse clinical outcomes,<sup>9,10</sup> and proposed solutions have ranged from streamlining inpatient admissions to expanding primary care and insurance coverage.<sup>5,8,10</sup> Others regard overcrowding as symptomatic of inadequate consumer engagement in medical decision making, suggesting that patients will reduce use of discretionary services if they share a greater proportion of health care costs.<sup>11-15</sup>

With health care premiums continuing to increase, policy makers,<sup>16</sup> public and private payers,<sup>17,18</sup> and employers<sup>20</sup> have shown interest in using high-deductible health plans (HDHPs) to control costs. These plans have low monthly premiums but subject most services to deductibles averaging \$2985 to \$4008 per year for family plans.<sup>20</sup> As a new health insurance product offering, high-deductible-associated plans have experienced rapid expansion; the percent-

**Context** Patients evaluated at emergency departments often present with nonemergency conditions that can be treated in other clinical settings. High-deductible health plans have been promoted as a means of reducing overutilization but could also be related to worse outcomes if patients defer necessary care.

**Objectives** To determine the relationship between transition to a high-deductible health plan and emergency department use for low- and high-severity conditions and to examine changes in subsequent hospitalizations.

**Design, Setting, and Participants** Analysis of emergency department visits and subsequent hospitalizations among 8724 individuals for 1 year before and after their employers mandated a switch from a traditional health maintenance organization plan to a high-deductible health plan, compared with 59 557 contemporaneous controls who remained in the traditional plan. All persons were aged 1 to 64 years and insured by a Massachusetts health plan between March 1, 2001, and June 30, 2005.

**Main Outcome Measures** Rates of first and repeat emergency department visits classified as low, indeterminate, or high severity during the baseline and follow-up periods, as well as rates of inpatient admission after emergency department visits.

**Results** Between the baseline and follow-up periods, emergency department visits among members who switched to high-deductible coverage decreased from 197.5 to 178.1 per 1000 members, while visits among controls remained at approximately 220 per 1000 (-10.0% adjusted difference in difference; 95% confidence interval [CI], -16.6% to -2.8%; *P* = .007). The high-deductible plan was not associated with a change in the rate of first visits occurring during the study period (-4.1% adjusted difference in difference; 95% CI, -11.8% to 4.3%). Repeat visits in the high-deductible group decreased from 334.6 to 255.3 visits per 1000 members and increased from 321.1 to 324.4 per 1000 members in controls (-24.9% difference in difference; 95% CI, -37.5% to -9.7%; *P* = .002). Low-severity repeat emergency department visits decreased in the high-deductible group from 142.5 to 92.1 per 1000 members and increased in controls from 128.0 to 132.5 visits per 1000 members (-36.4% adjusted difference in difference; 95% CI, -51.1% to -17.2%; *P* < .001), whereas a small decrease in high-severity visits in the high-deductible group could not be excluded. The adjusted difference in difference in the high-deductible group in the high-deductible decrease in high-severity visits from the emergency department in the high-deductible group decreased from 11.8% to 10.9% and increased from 11.9% to 13.6% among controls (-24.7% adjusted difference in difference; 95% CI, -41.0% to -3.9%; *P* = .02).

**Conclusions** Traditional health plan members who switched to high-deductible coverage visited the emergency department less frequently than controls, with reductions occurring primarily in repeat visits for conditions that were not classified as high severity and had decreases in the rate of hospitalizations from the emergency department. Further research is needed to determine long-term health care utilization patterns under high-deductible coverage and to assess risks and benefits related to clinical outcomes.

*JAMA*. 2007;297:1093-1102. www.jama.com  
DOI: 10.1001/jama.297.10.1093

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For editorial comment see p 1126.

## Utilization

Reduction in Emergency Room use even for severe emergencies

# Cost-Sharing Effects: High Deductibles

American Economic Review 2013, 103(1): 178-219  
<http://dx.doi.org/10.1257/aer.103.1.178>

## Selection on Moral Hazard in Health Insurance<sup>†</sup>

By LIRAN EINAV, AMY FINKELSTEIN, STEPHEN P. RYAN,  
PAUL SCHRIMPF, AND MARK R. CULLEN\*

*We use employee-level panel data from a single firm to explore the possibility that individuals may select insurance coverage in part based on their anticipated behavioral ("moral hazard") response to insurance, a phenomenon we label "selection on moral hazard." Using a model of plan choice and medical utilization, we present evidence of heterogeneous moral hazard as well as selection on it, and explore some of its implications. For example, we show that, at least in our context, abstracting from selection on moral hazard could lead to overestimates of the spending reduction associated with introducing a high-deductible health insurance option. (JEL D82, G22, I13, J32)*

Economic analysis of market failure in insurance markets tends to analyze selection and moral hazard as distinct phenomena. In this paper, we explore the potential for selection on moral hazard in insurance markets. By this we mean the possibility that moral hazard effects are heterogeneous across individuals, and that individuals' selection of insurance coverage is affected by their anticipated behavioral response to coverage. We examine these issues empirically in the context of employer-provided health insurance in the United States. Specifically, we break down the general

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<sup>†</sup>To view additional materials, visit the article page at <http://dx.doi.org/10.1257/aer.103.1.178>.

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## Outcomes

Distorts timing of care

## Cost-Sharing Effects

Type of cost sharing	Utilization fell as price rose?	Adverse events vs. better health care?
Deductible Coinsurance Copay	Yes – indiscriminately by service & population	Perhaps for low income, sickest patients
Tiered formularies	Yes – all drugs	Some evidence in asthma patients over age 5
Value-based design	Yes -	Increased medication compliance
High deductibles	Yes – even for “exempt” services	Not studied

### Things to keep in mind

Estimated effects of cost-sharing are remarkably consistent across settings:

- Every 10% rise in price causes fall in use/spending that is 4% or less (most are around 2.0%)

Health effects hard to demonstrate

- Average, healthy patient not affected
- Adverse events possible for sicker, poorer patients

## Cost-Sharing Effects

Will cost-sharing contain medical spending?

- YES, by about 20% if cost-sharing doubles

Will cost-sharing contribute to Act 48 goals of high-quality care & sustainable costs?

- Not nearly as likely for sickest, most vulnerable Vermonters
- Should be exercised strategically

# Goals

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There is a tradeoff between insurance and costs

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Cost-sharing lowers health care spending

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Cost-sharing has unintended consequences

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