Can Value Based Insurance Design Work for Medicare Beneficiaries with Diabetes?

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Acknowledgements

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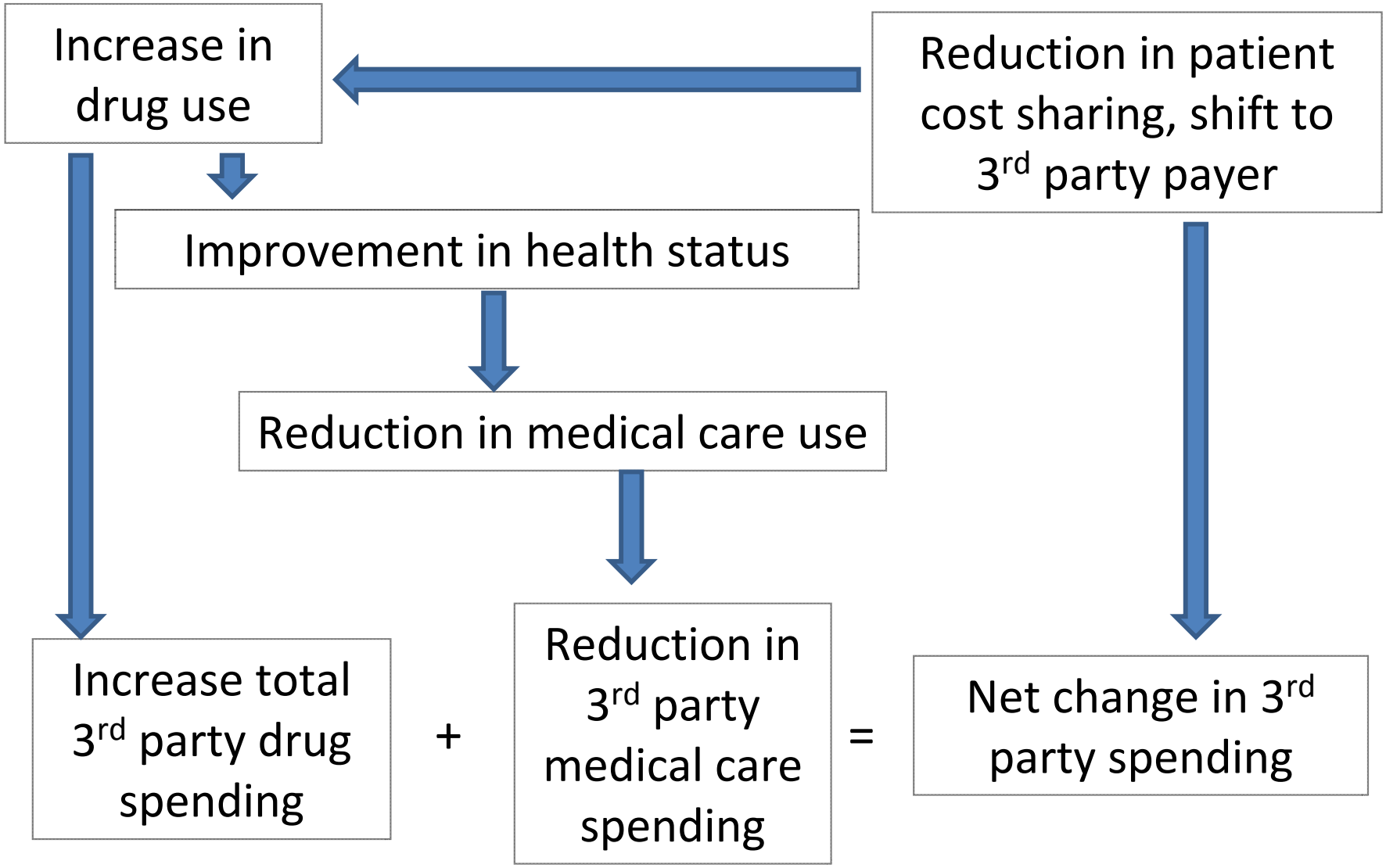
Clinical/Policy Problem:

- Adherence to guideline medication therapy => improved clinical outcomes
- Suboptimal medication adherence for chronic conditions among elderly
- Interventions that increase adherence (primary or secondary) may be cost saving
- Depends on
    - Cost of intervention
    - Effect of intervention on medication use
        - Cost of medications
    - Effect of medication use on clinical outcomes, medical care spending

Value based insurance design (VBID)

- Insurance benefits structured to increase use of effective therapies
- Focus on prescription drugs
  - other services may be relevant targets
- From societal perspective, expectation of both
  - improvement in health status
  - $ savings
- Savings from 3rd party perspective important to drive implementation

VBID at the margin, 3rd party payer perspective



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Diabetes – a likely candidate

Recommended treatment regimens

- Anti-diabetic agents (oral hypoglycemics)
- Renin-angiotensin-aldosterone system (RAAS) inhibitors
  - angiotensin-converting enzyme (ACE) inhibitors
  - angiotensin II receptor blockers (ARBs)
- HMG-CoA reductase inhibitors (statins)

Poor adherence =>

- disease progression and complications
- lost productivity
- premature disability
- increased mortality

Study objective

- Determine whether VBID is feasible (cost saving) in a Medicare population with diabetes
  - Build on prior evidence of medical savings associated with statin use
    - Stuart et al (under review) find $180-$234 medical savings per month supply
  - Explore potential for targeting by cardiovascular risk
  - Use microsimulation to measure changes in statin use & 3rd party spending associated with various cost sharing changes

Methods Overview

- Select sample of diabetic statin users
- Estimate effect of out of pocket price (OOPP) on statin use
- Estimate effect of statin use on medical care spending
- Microsimulate effects of OOPP reductions on statin use, medical care spending
- Calculate net change in 3rd party payer spending

Data

- Medicare Current Beneficiary Survey (MCBS)
  - Nationally representative household survey of Medicare beneficiary population
  - Panel design; 4,500 new entrants, 4 year duration
  - Collects data on beneficiary demographics, health status, supplemental insurance, health care use & spending
  - Self report of prescription drug use
    - drug name, administration, dose, quantity (pill count)
  - Linked to Medicare Part A & B claims
- Data from 1997 through 2005
  - Created 4 year cohorts: 1997-2000, 1998-2001, etc

Study sample

- Self report (doctor ever told) or ICD 9 diagnosis of diabetes in 1st year
- Used statin in year 2 (1st year with drug data)
- Excluded Medicaid – cost sharing and price response expected to be unrepresentative of privately insured
- Miscellaneous inclusion/exclusion criteria
  - MA enrolled (incomplete claims)
  - Not consistently enrolled in Medicare Part A & B
- N = 899

Measurement of key variables

- Statin fills
  - Used pill count to generate standardized 30 pill fills
  - Cumulative over three years
    - Captures both short and medium term effects
    - Acknowledge unobserved drug use prior to observation period
- Out of pocket price (OOPP), base year
  - Summed OOP spending on statins/# 30 pill fills
- Medicare Part A & Part B spending
  - Cumulative 3 year
  - $ standardized to 2005 using medical component of CPI

Control variables

- Demographics
  - Age, race, sex, marital status, education, income, region
  - Supplemental medical insurance in medical spending model
- Health status
  - Self report general, # ADL limitations, obesity, smoking
  - Diabetes complications, co-morbid conditions
    - CHF, COPD, IHD, hyperlipidemia, osteoarthritis, dementia, other mental health
- Count of other medications classes used
  - Addresses “healthy adherer” bias
- Panel start year
- Survivorship
  - Days in community
  - Indicators for death, move to facility, other loss to follow-up

Targeting high(er) risk beneficiaries

- Framingham risk calculator assigns 10 year risk of cardiovascular event
  - Used version designed for office use (no lab values)
  - Points assigned for age, BMI, smoking, systolic BP if treated, untreated hypertensive, diabetes
  - Modified
    - Assumed systolic BP = 120 if no hypertension; BP = 140 if hypertensive
    - All patients get points for diabetes
  - Examined risk score distribution x sex
  - Selected cut points => 40% high risk

Methods

- OLS model:

$$\#\ \text{statin fills} = \alpha + \beta\ \text{OOPP} + \delta\ X + \varepsilon$$

- GLM with gamma distribution & log link:

$$\text{Medical \$} = \gamma + \lambda\ \text{fills} + \mu\ X + \nu$$

Methods (cont.)

- Microsimulate effects of OOPP reductions
  - Predict fills, spending at baseline OOPP
  - Cap OOPP at VBID levels ($25, $20, $15, $10, $5, $1)
  - Predict # statin fills
  - Substitute predicted fills into dataset, predict medical spending
  - Calculate 3rd party spending
    - Baseline
    - VBID, change from baseline

Results

Estimated price response from model predicting statin fills

Cohort	N	Mean price ($)	Mean fills (N)	Coef	Price elasticity
Overall	899	28.77	24.41	-0.086	-0.101
High risk	350	26.81	25.50	-0.106	-0.111
Low risk	549	30.02	23.72	-0.070	-0.089
Estimated effects significant at p<=.001					

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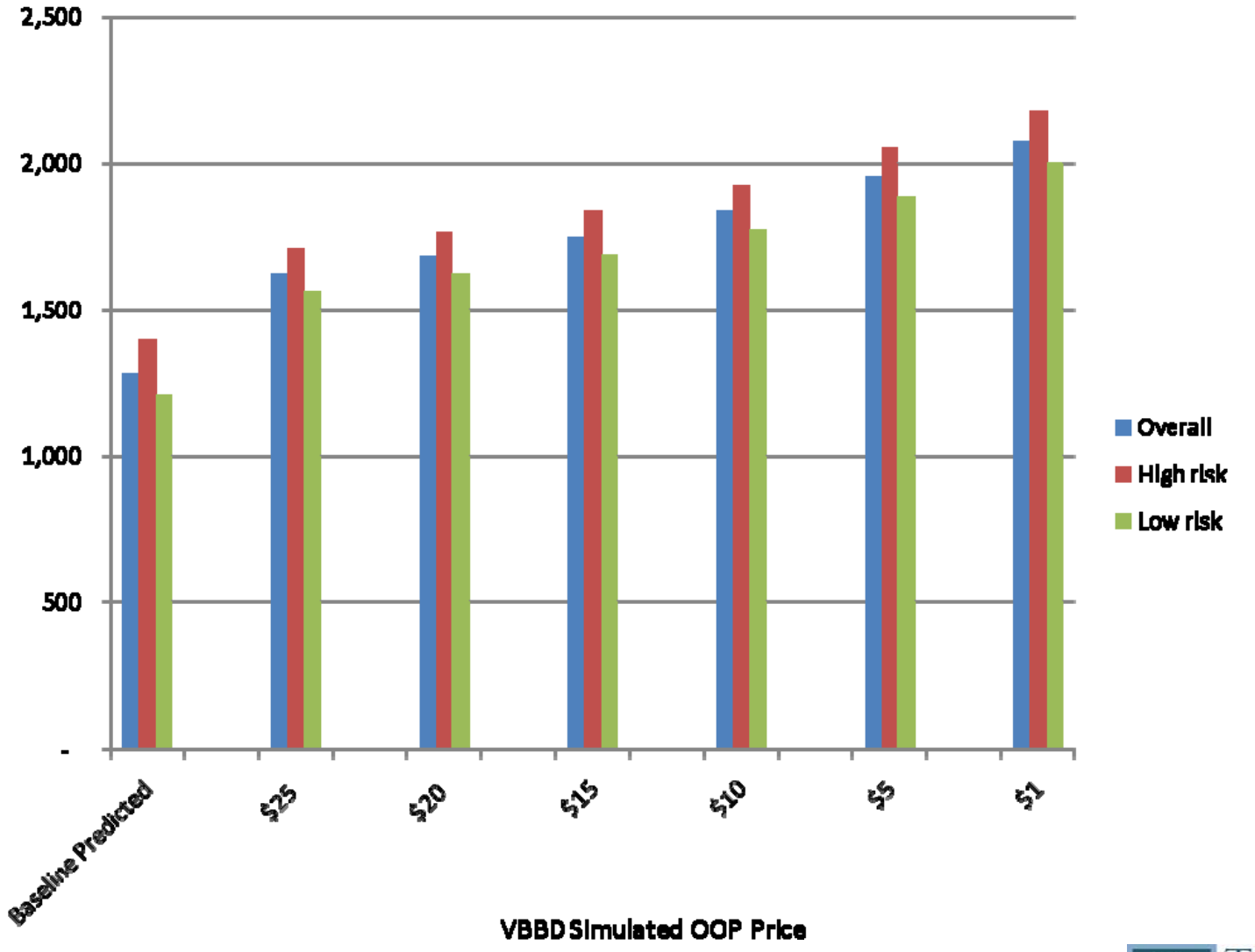
Estimated Medicare Part A & B spending reductions

Cohort	N	Medicare Part A & B Spending ($)	Marginal effect incremental fill ($)	P>|z|
Overall	899	36,690	-159.57	0.03
High risk	350	40,041	-279.54	0.01
Low risk	549	34,553	-97.47	0.29

VBBD Simulation Results: 3rd Party Drug $



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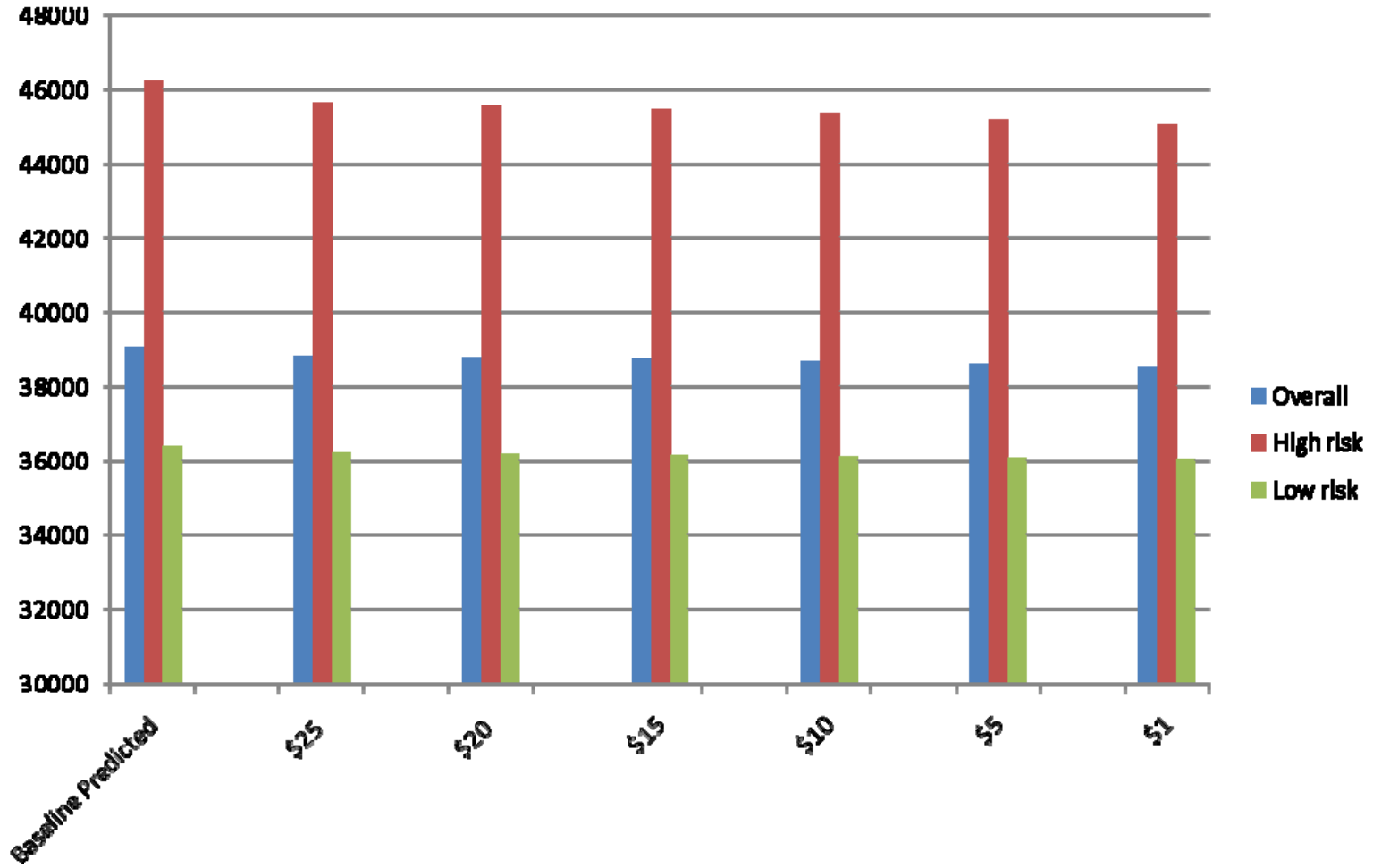
VBBD Simulation Results: Medicare A&B spending



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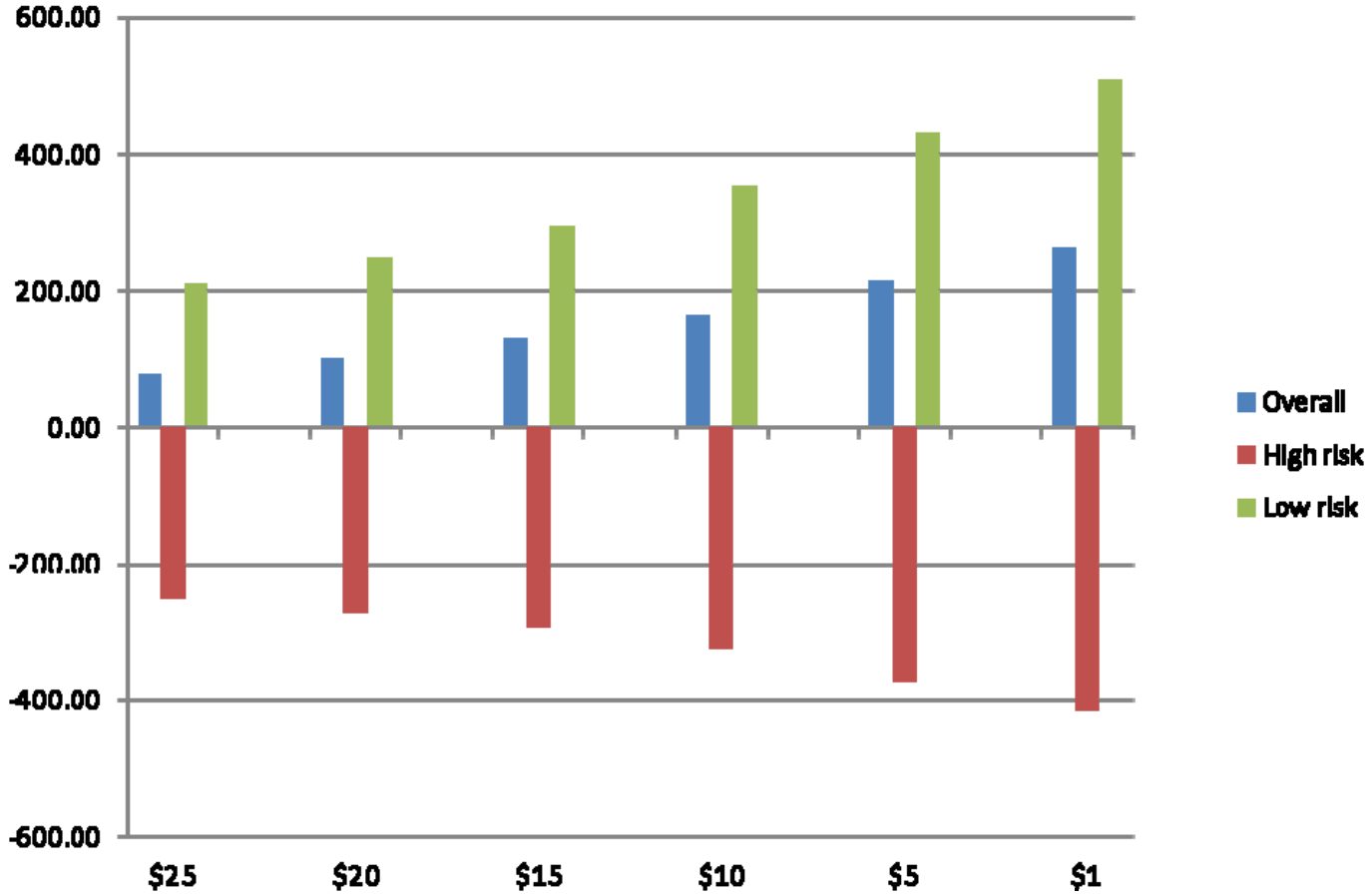
Net effects of VBID on 3rd party (Medicare medical plus drug plan) spending



Simulated VBID OOP Price

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Conclusions

- VBID in the Medicare population may be a successful strategy
  - Demonstrated for limited situation of diabetic statin users
- From payer perspective, need to target to high(er) risk beneficiaries
- Societal perspective => greater support for overall VBID

Limitations of current study

- Observational study on sub-sample of diabetic statin users
- OOPP measured is *ex poste*, may be endogenous
- Deterministic predictions
  - Micro-simulation captures heterogeneity in response based on individual characteristics
  - Estimates do not (yet) address uncertainty in behavioral responses.

Policy implications

Current structure of Medicare drug coverage does not support adoption of VBID

- Standalone design of Part D PDPs creates no incentives to adjust benefits to reduce medical spending
- MA-PDs better model
- Medicare could mandate and fund changes to PDP benefit structure

Policy implications (cont.)

- Targeting benefit change essential to meet VBID bottom line, but difficult policy to implement
- VBID does not address value to beneficiaries associated with improved health outcomes
- Big picture – why would we dicker over copays for treatments that work, when we pay for treatments without evidence of benefit?