Quality Disclosure and Regulation

Scoring Design in Medicare Advantage

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What's the point?

1. Endogenous quality (Spence, 1975)

- **Setting:** Monopoly (or oligopoly) when firms set both price and quality
- **Intuition:** Firm invests to the point where marginal quality valuation meets marginal costs of quality, but socially optimal quality depends on average valuation
- **Takeaway:** Profit-maximizing quality will differ from socially optimal quality when the marginal customer is not representative of the average

Natural in the presence of adverse selection, where the marginal patient is almost always different from the average patient

2. Types of quality disclosure

- Self-disclosed quality via advertising
- Word-of-mouth and aggregated reviews form users (Google, Rotten Tomatoes, etc.)
- Third-party rating agencies
- **Government regulation via mandated disclosure or licensing**

The main idea

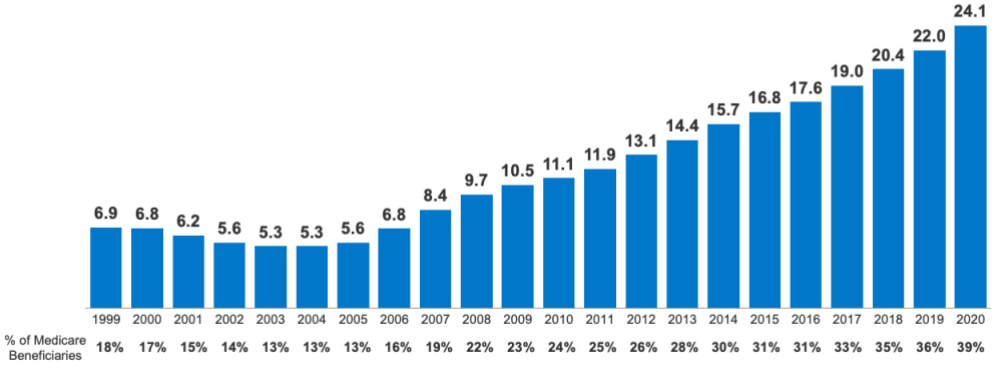
- Need some form of quality disclosure to aid decision making
- Full-disclosure likely yields under-investment in quality
- Regulator can improve quality via coarse rating scores
- but...firms will respond to the scoring design accordingly

Context

Medicare Advantage

Figure 1

Total Medicare Advantage Enrollment, 1999-2020 (in millions)



NOTE: Includes cost plans as well as Medicare Advantage plans. About 62 million people are enrolled in Medicare in 2020.
SOURCE: KFF analysis of CMS Medicare Advantage Enrollment Files 2008-2020, and MPR, 1999-2007; enrollment numbers from March of the respective year, with the exception of 2006, which is from April. Number of people eligible for Medicare comes from the CMS Medicare Advantage Penetration Files for years 2008-2009; for years 2010-2020, number of people eligible for Medicare comes from the Medicare Enrollment Dashboard.

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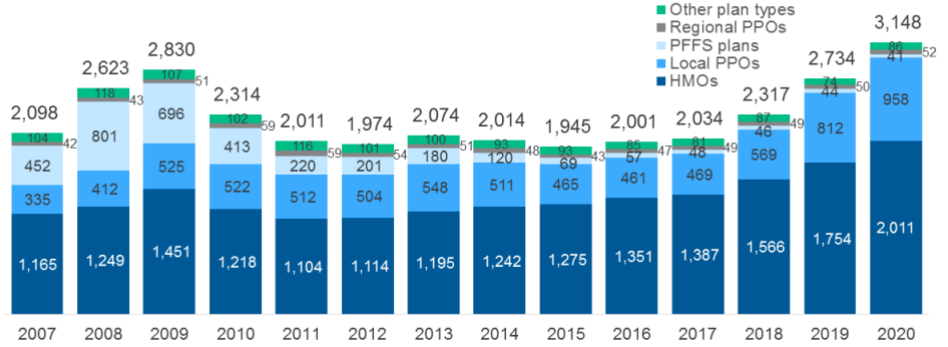
Figure 1

More Medicare Advantage plans are available in 2020 than in any other year

Number of Medicare Advantage plans generally available by plan type, 2007-2020



NOTE: Excludes SNPs, EGHPs, HCPPs, and PACE plans. Other category includes cost plans and Medicare MSAs.
SOURCE: Kaiser Family Foundation analysis of CMS's Landscape Files for 2007 – 2020.

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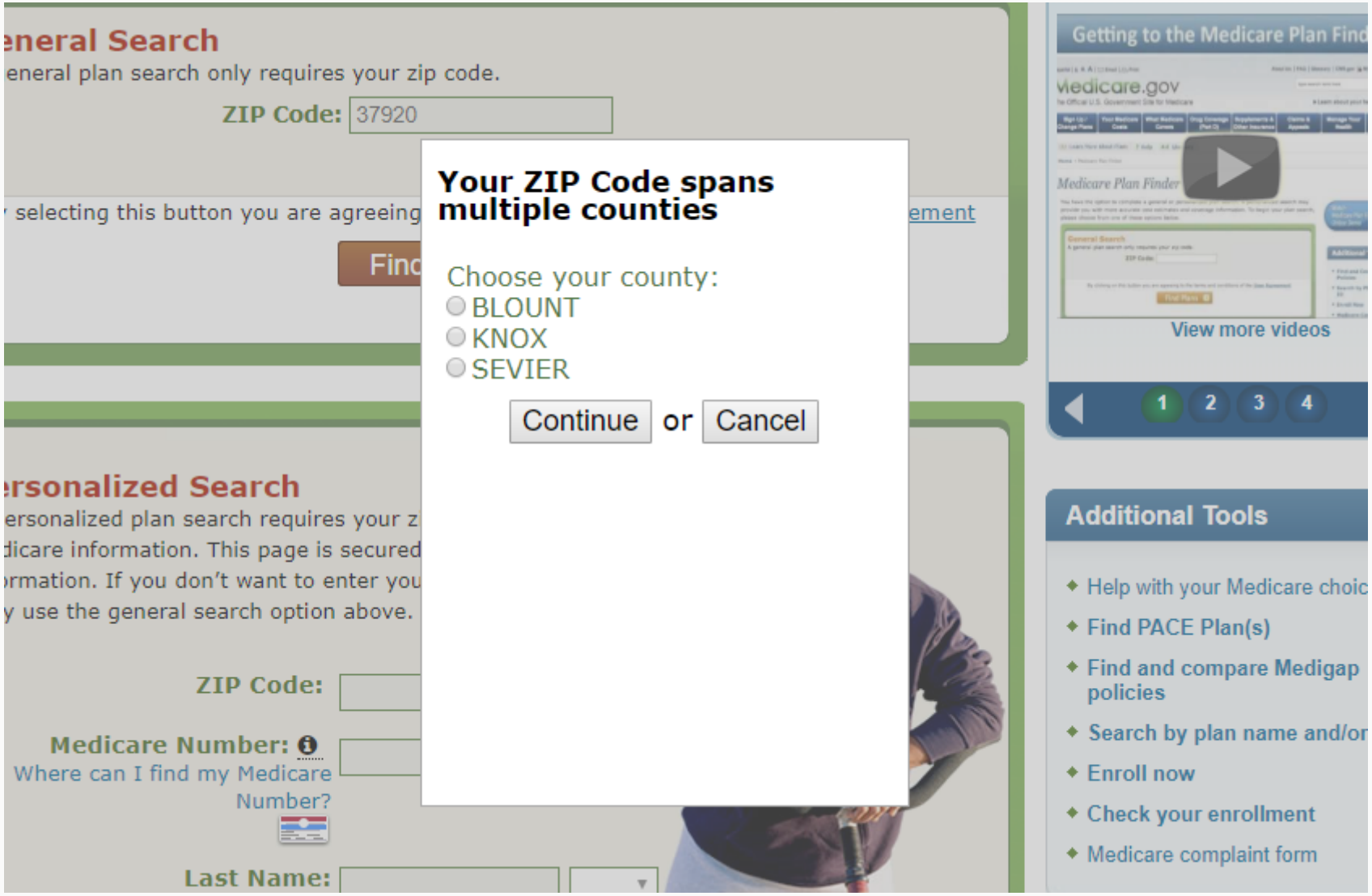
Selecting an MA plan

When someone nears 65, they'll receive:

- Medicare & You Booklet (128 pages in 2022)
- Points beneficiary to Medicare's online plan finder tool
- **Lots** of other marketing materials touting different types of plans
  - Standalone Part D plans
  - Medicare supplemental plans
  - Medicare Advantage plans
- Assume someone has decided to search for an MA plan online


Medicare.gov | Medicare Plan Finder
The Official U.S. Government Site for Medicare
type search term here
Search
Medicare Plan Finder Home
Learn More About Plans
Help
Glossary
FAQ
Home
Medicare Plan Finder
You have the option to complete a general or personalized plan search. A personalized search may provide you with more accurate cost estimates and coverage information. To begin your plan search, please choose from one of these options below.
General Search
A general plan search only requires your zip code.
ZIP Code: 37920
By selecting this button you are agreeing to the terms and conditions of the User Agreement
Find Plans
Plan Finder Multimedia
Step by step overview on how to complete a plan search
Lesson 1- Getting Started
Getting to the Medicare Plan Finder
View more videos
1
2
3
4


eneral Search
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ZIP Code: 37920
selecting this button you are agreeing
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Find
Your ZIP Code spans multiple counties
Choose your county:
BLOUNT
KNOX
SEVIER
Continue or Cancel
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dicare information. This page is secured
rmation. If you don't want to enter you
y use the general search option above.
ZIP Code:
Medicare Number:
Where can I find my Medicare Number?
Last Name:
Getting to the Medicare Plan Find
Medicare.gov
Medicare Plan Finder
View more videos
1 2 3 4
Additional Tools
Help with your Medicare choic
Find PACE Plan(s)
Find and compare Medigap policies
Search by plan name and/or
Enroll now
Check your enrollment
Medicare complaint form

All fields on the page are required unless noted as Optional.

How do you get your Medicare coverage?

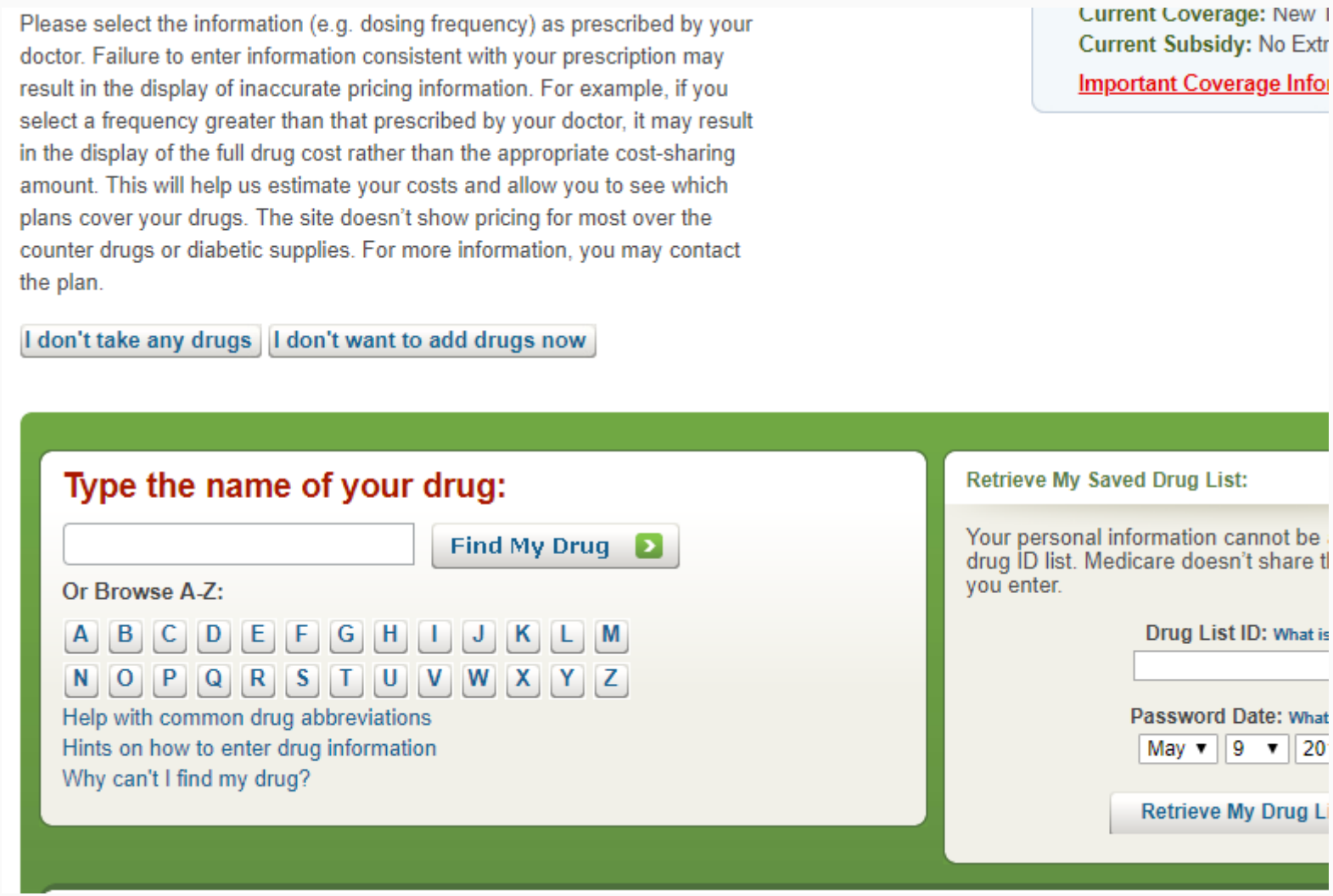
- ○ Original Medicare
- ○ Medicare Health Plan (Such as an HMO, PPO, or Private-Fee-for-service plan)
- ○ I don't have any Medicare coverage yet
- ○ I don't know what coverage I have

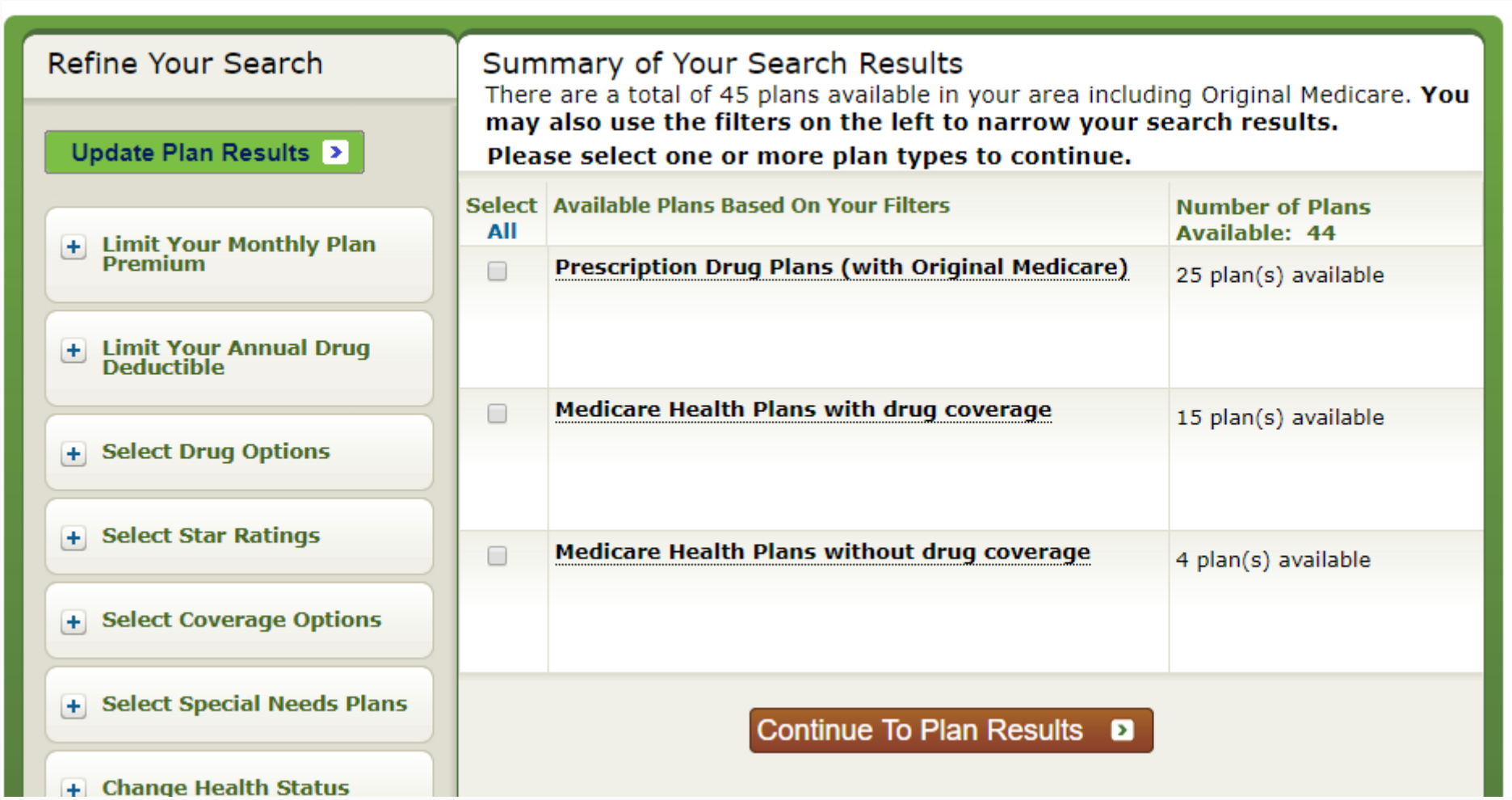
Do you get help from Medicare or your state to pay your Medicare prescription drug costs?

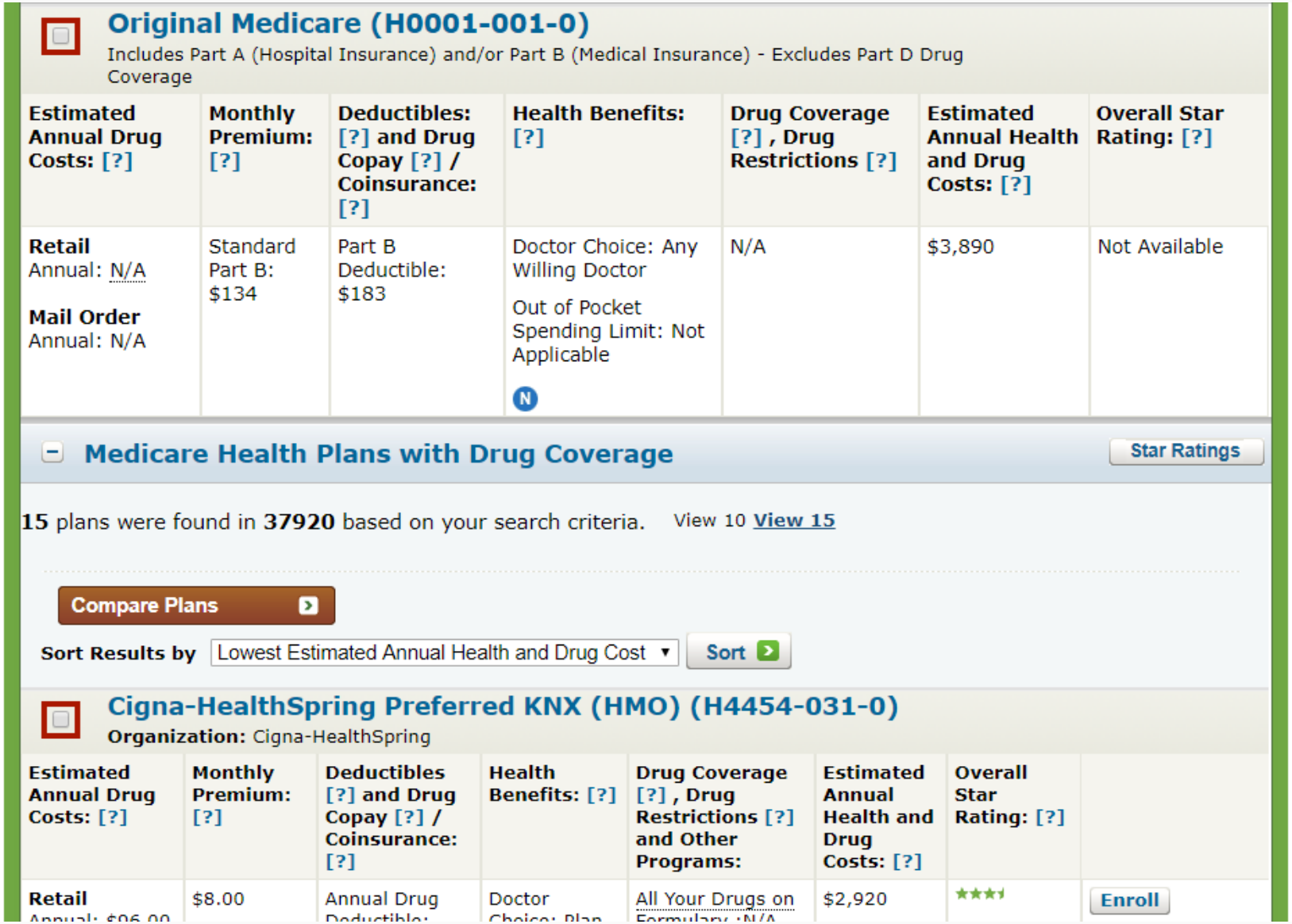
- ○ I get help from Medicaid
- ○ I get supplemental security income
- ○ I belong to a Medicare Savings Program (MSP)
- ○ I applied for and got extra help through social security
- ○ I don't get any extra help
- ○ I don't know

Go Back

Continue to Plan Results ›


Current Coverage: New
Current Subsidy: No Extr
Important Coverage Info
Please select the information (e.g. dosing frequency) as prescribed by your doctor. Failure to enter information consistent with your prescription may result in the display of inaccurate pricing information. For example, if you select a frequency greater than that prescribed by your doctor, it may result in the display of the full drug cost rather than the appropriate cost-sharing amount. This will help us estimate your costs and allow you to see which plans cover your drugs. The site doesn't show pricing for most over the counter drugs or diabetic supplies. For more information, you may contact the plan.
I don't take any drugs
I don't want to add drugs now
Type the name of your drug:
Find My Drug
Or Browse A-Z:
A B C D E F G H I J K L M
N O P Q R S T U V W X Y Z
Help with common drug abbreviations
Hints on how to enter drug information
Why can't I find my drug?
Retrieve My Saved Drug List:
Your personal information cannot be
drug ID list. Medicare doesn't share t
you enter.
Drug List ID: What is
Password Date: What
May
9
Retrieve My Drug Li


Refine Your Search
Update Plan Results
Limit Your Monthly Plan Premium
Limit Your Annual Drug Deductible
Select Drug Options
Select Star Ratings
Select Coverage Options
Select Special Needs Plans
Change Health Status
Summary of Your Search Results
There are a total of 45 plans available in your area including Original Medicare. You may also use the filters on the left to narrow your search results.
Please select one or more plan types to continue.
Select All
Available Plans Based On Your Filters
Number of Plans Available: 44
Prescription Drug Plans (with Original Medicare)
25 plan(s) available
Medicare Health Plans with drug coverage
15 plan(s) available
Medicare Health Plans without drug coverage
4 plan(s) available
Continue To Plan Results



Original Medicare (H0001-001-0)

Includes Part A (Hospital Insurance) and/or Part B (Medical Insurance) - Excludes Part D Drug Coverage

Estimated Annual Drug Costs: [?]	Monthly Premium: [?]	Deductibles: [?] and Drug Copay [?] / Coinsurance: [?]	Health Benefits: [?]	Drug Coverage [?], Drug Restrictions [?]	Estimated Annual Health and Drug Costs: [?]	Overall Star Rating: [?]
Retail Annual: N/A **Mail Order** Annual: N/A	Standard Part B: $134	Part B Deductible: $183	Doctor Choice: Any Willing Doctor Out of Pocket Spending Limit: Not Applicable N	N/A	$3,890	Not Available

Medicare Health Plans with Drug Coverage

Star Ratings

15 plans were found in **37920** based on your search criteria. View 10 View 15

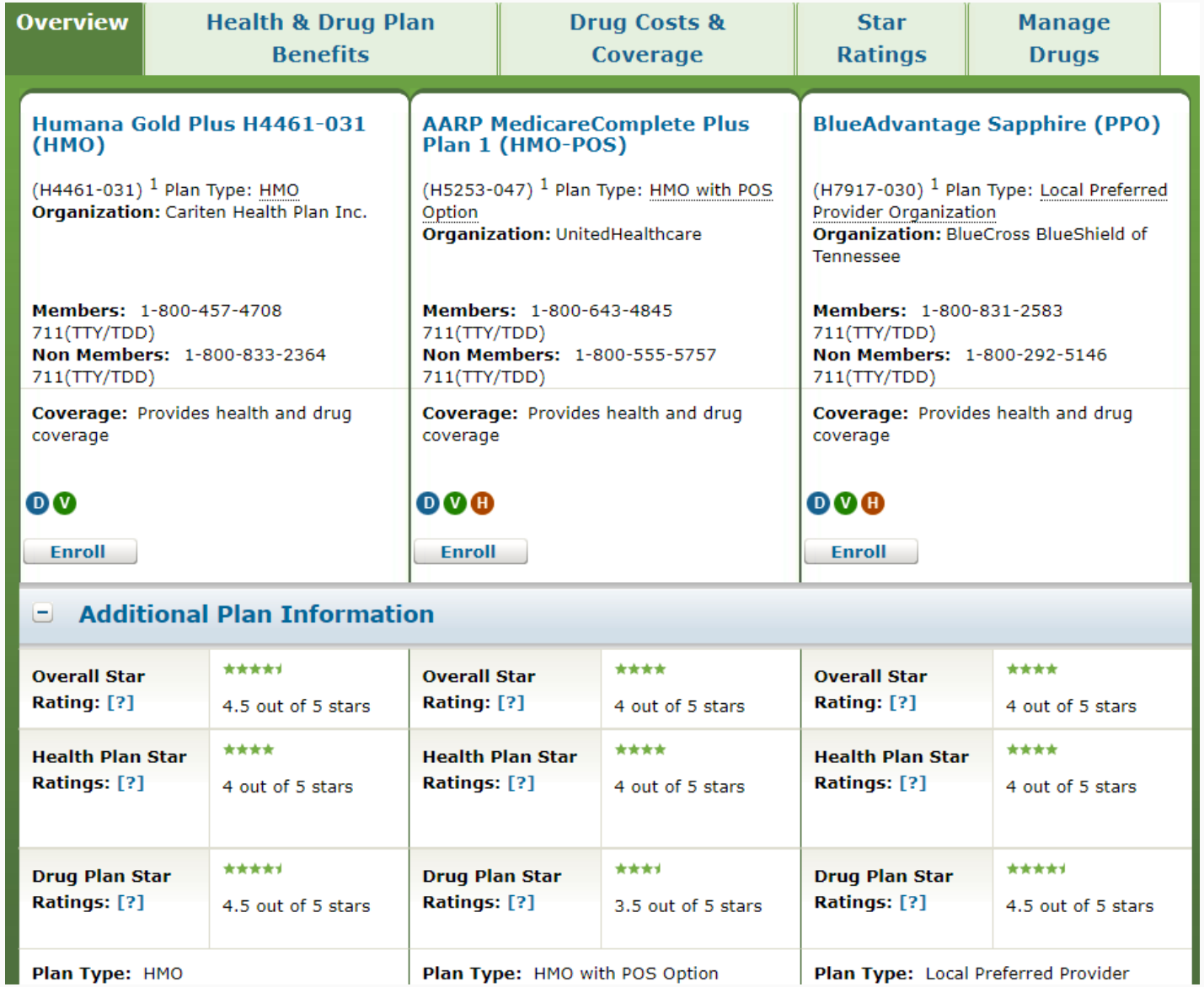
Compare Plans

Sort Results by Lowest Estimated Annual Health and Drug Cost ▾ Sort

Cigna-HealthSpring Preferred KNX (HMO) (H4454-031-0)

Organization: Cigna-HealthSpring

Estimated Annual Drug Costs: [?]	Monthly Premium: [?]	Deductibles [?] and Drug Copay [?] / Coinsurance: [?]	Health Benefits: [?]	Drug Coverage [?], Drug Restrictions [?] and Other Programs:	Estimated Annual Health and Drug Costs: [?]	Overall Star Rating: [?]	
Retail Annual: $96.00	$8.00	Annual Drug Deductible:	Doctor Choice: Plan	All Your Drugs on Formulary: N/A	$2,920	★★★½	Enroll



Overview | Health & Drug Plan Benefits | Drug Costs & Coverage | Star Ratings | Manage Drugs

Humana Gold Plus H4461-031 (HMO)	AARP MedicareComplete Plus Plan 1 (HMO-POS)	BlueAdvantage Sapphire (PPO)
(H4461-031) [1] Plan Type: HMO **Organization:** Cariten Health Plan Inc.	(H5253-047) [1] Plan Type: HMO with POS Option **Organization:** UnitedHealthcare	(H7917-030) [1] Plan Type: Local Preferred Provider Organization **Organization:** BlueCross BlueShield of Tennessee
Members: 1-800-457-4708 711(TTY/TDD) **Non Members:** 1-800-833-2364 711(TTY/TDD)	**Members:** 1-800-643-4845 711(TTY/TDD) **Non Members:** 1-800-555-5757 711(TTY/TDD)	**Members:** 1-800-831-2583 711(TTY/TDD) **Non Members:** 1-800-292-5146 711(TTY/TDD)
Coverage: Provides health and drug coverage	**Coverage:** Provides health and drug coverage	**Coverage:** Provides health and drug coverage
D V	D V H	D V H
Enroll	Enroll	Enroll

Additional Plan Information

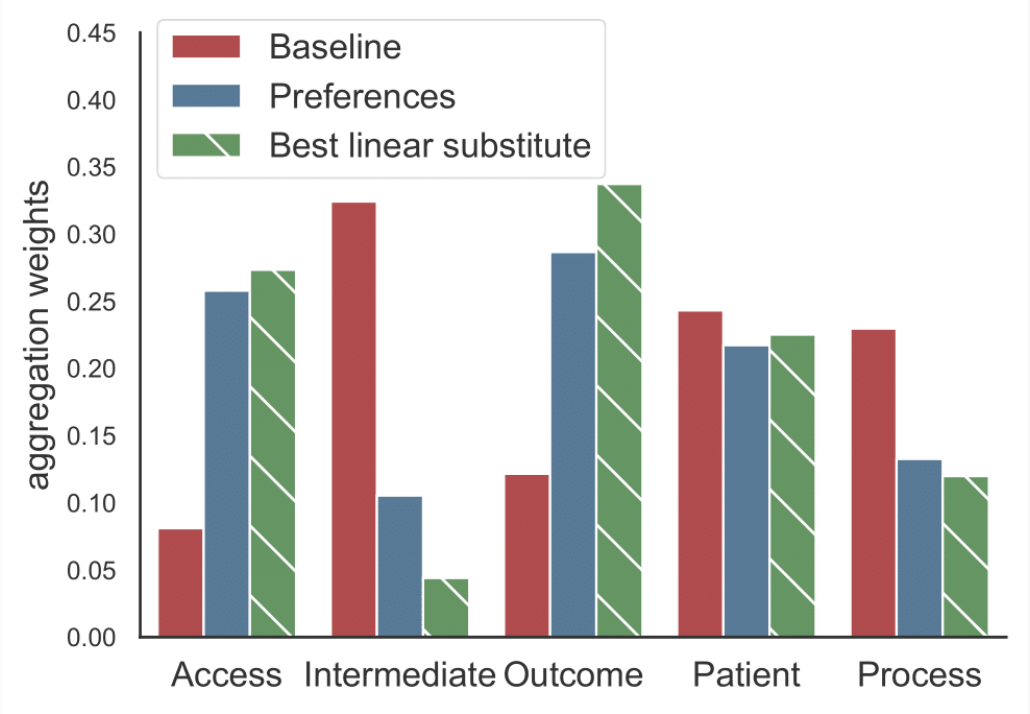
	Humana Gold Plus H4461-031 (HMO)	AARP MedicareComplete Plus Plan 1 (HMO-POS)	BlueAdvantage Sapphire (PPO)
Overall Star Rating: [?]	★★★★½ 4.5 out of 5 stars	★★★★ 4 out of 5 stars	★★★★ 4 out of 5 stars
Health Plan Star Ratings: [?]	★★★★ 4 out of 5 stars	★★★★ 4 out of 5 stars	★★★★ 4 out of 5 stars
Drug Plan Star Ratings: [?]	★★★★½ 4.5 out of 5 stars	★★★½ 3.5 out of 5 stars	★★★★½ 4.5 out of 5 stars
Plan Type:	HMO	HMO with POS Option	Local Preferred Provider

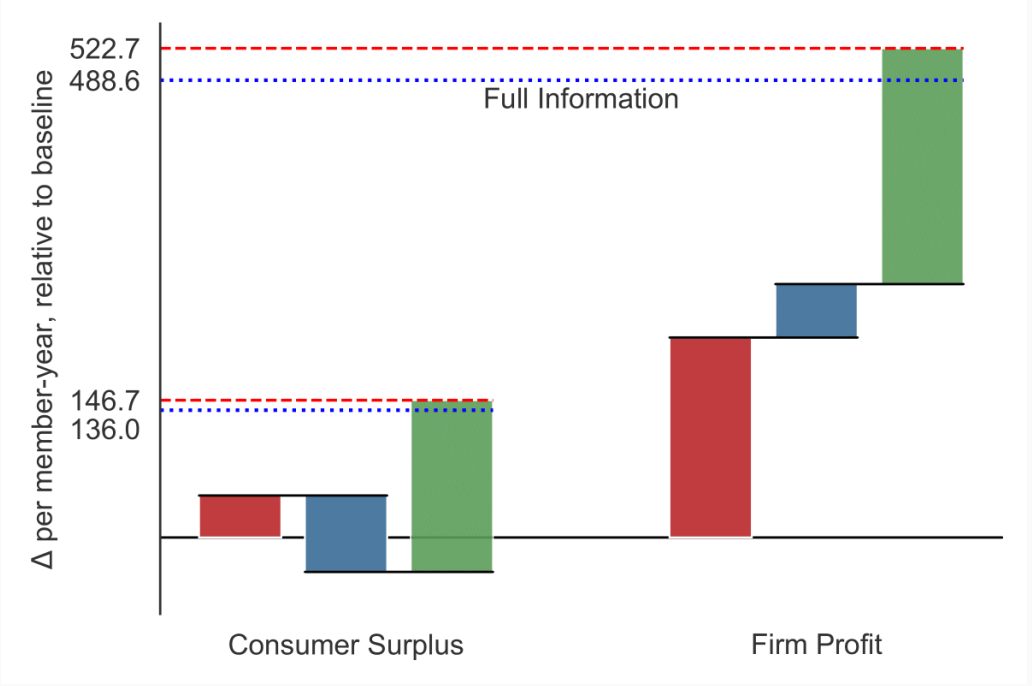
Star Ratings

MEASURE	DEFINITION
Overall Star Rating	The **Overall Star Rating** gives an overall rating of the plan's quality and performance for the types of services each plan offers. For plans covering health services, this is an overall rating for the quality of many medical/health care services that fall into 5 categories: ◆ **Staying healthy: screening tests and vaccines.** Includes whether members got various screening tests, vaccines, and other check-ups to help them stay healthy. ◆ **Managing chronic (long-term) conditions**: Includes how often members with certain conditions got recommended tests and treatments to help manage their condition. ◆ **Member experience with the health plan**: Includes member ratings of the plan. ◆ **Member complaints and changes in the health plan's performance:** Includes how often Medicare found problems with the plan and how often members had problems with the plan. Includes how much the plan's performance has improved (if at all) over time. ◆ **Health plan customer service**: Includes how well the plan handles member appeals. For plans covering drug services, this is an overall rating for the quality of prescription-related services that fall into 4 categories: ◆ **Drug plan customer service:** Includes how well the plan handles member appeals. ◆ **Member complaints and changes in the drug plan's performance**: Includes how often Medicare found problems with the plan and how often members had problems with the plan. Includes how much the plan's performance has improved (if at all) over time. ◆ **Member experience with plan's drug services:** Includes member ratings of the plan. ◆ **Drug safety and accuracy of drug pricing**: Includes how accurate the plan's pricing information is and how often members with certain medical conditions are prescribed drugs in a way that is safer and clinically recommended for their condition.

Preview of findings

1. Estimate structural model of price **and quality investments**
2. Identify optimal scoring design



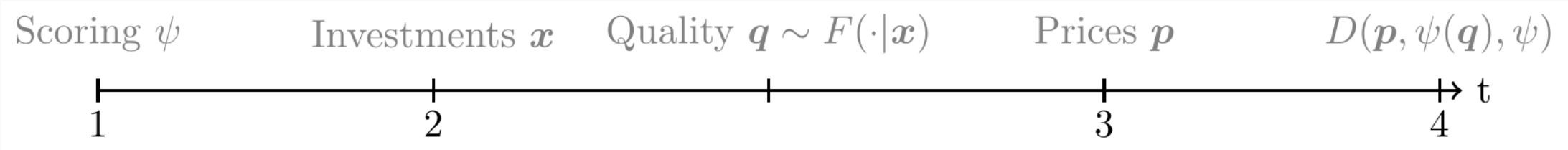


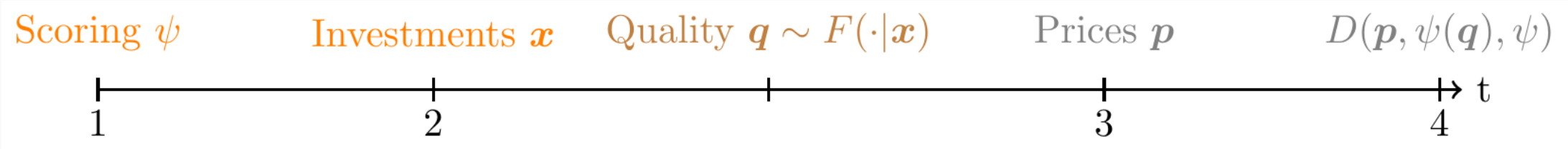
Some points of applause

- Substantial contribution, both theoretical and empirical
- Highly policy relevant

"To address this, I completed the data by reviewing a decade of public communications by CMS aimed at insurers. I recover year-to-year changes to the scoring design, **replicating the public scoring assignment perfectly.**"

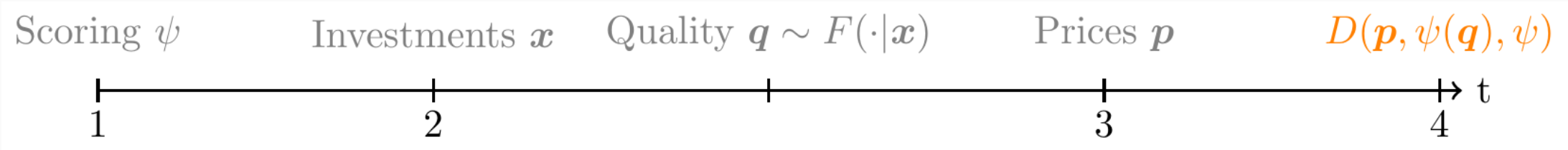
Setup and estimation


Scoring ψ
Investments $\boldsymbol{x}$
Quality $\boldsymbol{q} \sim F(\cdot|\boldsymbol{x})$
Prices $\boldsymbol{p}$
$D(\boldsymbol{p}, \psi(\boldsymbol{q}), \psi)$
t
1
2
3
4



What's new here?

- Endogenous quality investments with imperfect mapping into quality scores
- Endogenous scoring design



$$u_{ij} = \underbrace{\alpha_i P_j}_{\text{premium}} + \underbrace{\beta_i b_j}_{\text{coverage}} + \underbrace{\mathcal{E}_\psi[\boldsymbol{\gamma}'\boldsymbol{q}|\psi(q_j)]}_{\text{quality}} + \underbrace{\lambda' z_{ij}}_{\substack{\text{Obs.} \\ \text{attributes}}} + \underbrace{\xi_j}_{\substack{\text{unobs.} \\ \text{preferences}}} + \underbrace{\varepsilon_{ij}}_{\sim\text{T1EV}}$$

Demand estimation

$$u_{ij} = \underbrace{\alpha_i P_j}_{\text{premium}} + \underbrace{\beta_i b_j}_{\text{coverage}} + \underbrace{\mathcal{E}_\psi[\boldsymbol{\gamma}'\boldsymbol{q}|\psi(q_j)]}_{\text{quality}} + \underbrace{\lambda' z_{ij}}_{\substack{\text{Obs.}\\ \text{attributes}}} + \underbrace{\xi_j}_{\substack{\text{unobs.}\\ \text{preferences}}} + \underbrace{\varepsilon_{ij}}_{\sim\text{T1EV}}$$

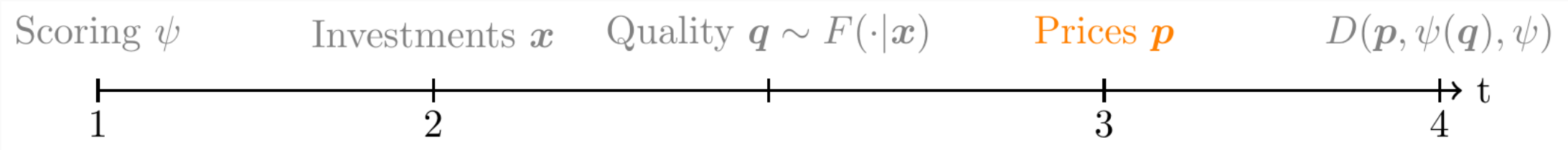
Two-step process:

1. Estimate mean preferences, $\hat{\delta}_j$, from $u_{ij} = \delta_j + \xi_j + \varepsilon_{ij}$,
2. TSLS regression of $\hat{\delta}_j$ on observable characteristics and fixed effects. 3 (if needed). Estimate preference for quality by minimizing the square difference between a contract fixed effect and expected quality, $\eta_j - \boldsymbol{\gamma}\mathcal{E}[\boldsymbol{q}|r, \psi]$, across time periods (pairwise time period differences).

Question/concern

Estimating preferences for quality...

- within an estimated fixed effect, $\hat{\eta}$
- within an estimated mean preference, $\hat{\delta}$
- What does the distribution of these fixed effects look like?
- How much variation exists in **within-contract** quality (or expected quality) over time?



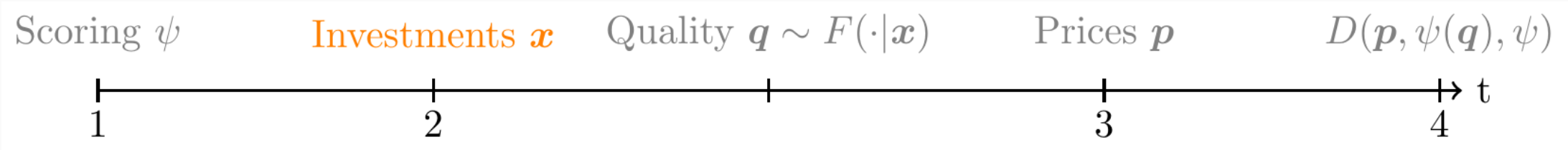
$$\pi_f(\boldsymbol{q}, \psi) = \max_{\{p_j\}_{j \in J_f}} \sum_{j \in J_f} \underbrace{D_j(\boldsymbol{p}, \psi(\boldsymbol{q}))}_{\text{demand}} \Big(\underbrace{R_j(p_j)}_{\text{mg. revenue}} - \underbrace{C(\boldsymbol{q}_j, \boldsymbol{z}_j, \boldsymbol{\theta}_j)}_{\text{mg. cost}} \Big)$$

Pricing (insurance costs) estimation

$$\pi_f(\boldsymbol{q}, \psi) = \max_{\{p_j\}_{j \in J_f}} \sum_{j \in J_f} \underbrace{D_j(\boldsymbol{p}, \psi(\boldsymbol{q}))}_{\text{demand}} \Big(\underbrace{R_j(p_j)}_{\text{mg. revenue}} - \underbrace{C(\boldsymbol{q}_j, \boldsymbol{z}_j, \boldsymbol{\theta}_j)}_{\text{mg. cost}} \Big)$$

- Profit maximization yields standard $MR = MC$ expression
- Recover marginal costs
- Decompose marginal costs into part due to quality, other observable components, and residual,

$$MC = \boldsymbol{\theta}_q^c \boldsymbol{q} + \boldsymbol{\theta}_a^c \boldsymbol{a} + c$$



$$\max_{\boldsymbol{x}_f \in \mathbb{R}^{|\mathcal{Q}| \times |J_f|}} \underbrace{\int E\left[\pi_f(\boldsymbol{q}_f, \boldsymbol{q}_{-f}, \psi)\right] dF(\boldsymbol{q}_f|\boldsymbol{x}_f)}_{\text{expected insurance profit}} - \underbrace{I(\boldsymbol{x}_f, \boldsymbol{\mu}_f)}_{\text{investment cost}}$$

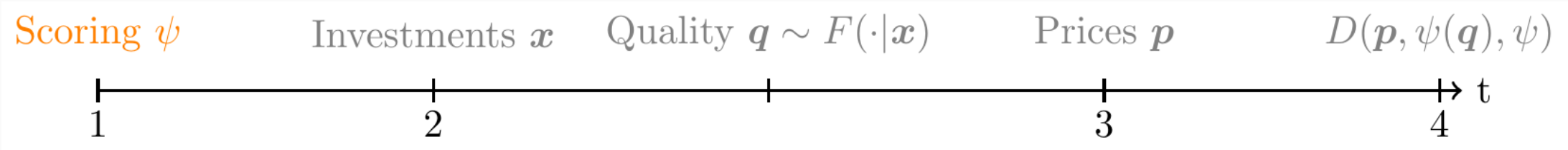
Quality (investment costs) estimation

$$\max_{\boldsymbol{x}_f \in \mathbb{R}^{|\mathcal{Q}|\times|J_f|}} \underbrace{\int E\left[\pi_f(\boldsymbol{q}_f, \boldsymbol{q}_{-f}, \psi)\right] dF(\boldsymbol{q}_f|\boldsymbol{x}_f)}_{\text{expected insurance profit}} - \underbrace{I(\boldsymbol{x}_f, \boldsymbol{\mu_f})}_{\text{investment cost}}$$

- Equate marginal revenue from quality investment with marginal investment cost
- Assume investment costs are quadratic and **separable across products and categories**

Question/concern

- Costs almost surely are **not** separable across categories
- Investment in network changes access, outcomes, patient surveys
- Investment for one contract likely spills over into other contracts for same insurer
- How much does this matter?



$$\max_{\psi \in \Psi} E_{\boldsymbol{q}}[\underbrace{CS(\psi, \boldsymbol{q})}_{\text{Consumer surplus}} + \underbrace{\rho^F \sum_f V_f(\psi, \boldsymbol{q}) - I(\boldsymbol{x}_f^*(\psi), \mu_f)}_{\text{Insurer profit}} - \underbrace{\rho^G Gov(\psi, \boldsymbol{q})}_{\text{Government spending}} | \boldsymbol{x}^*(\psi)]$$

Scoring design estimation

$$\max_{\psi \in \Psi} E_{\boldsymbol{q}}[\underbrace{CS(\psi, \boldsymbol{q})}_{\substack{\text{Consumer} \\ \text{surplus}}} + \underbrace{\rho^F \sum_f V_f(\psi, \boldsymbol{q}) - I(\boldsymbol{x}_f^*(\psi), \mu_f)}_{\substack{\text{Insurer} \\ \text{profit}}} - \rho^G \underbrace{Gov(\psi, \boldsymbol{q})}_{\substack{\text{Government} \\ \text{spending}}} | \boldsymbol{x}^*(\psi)]$$

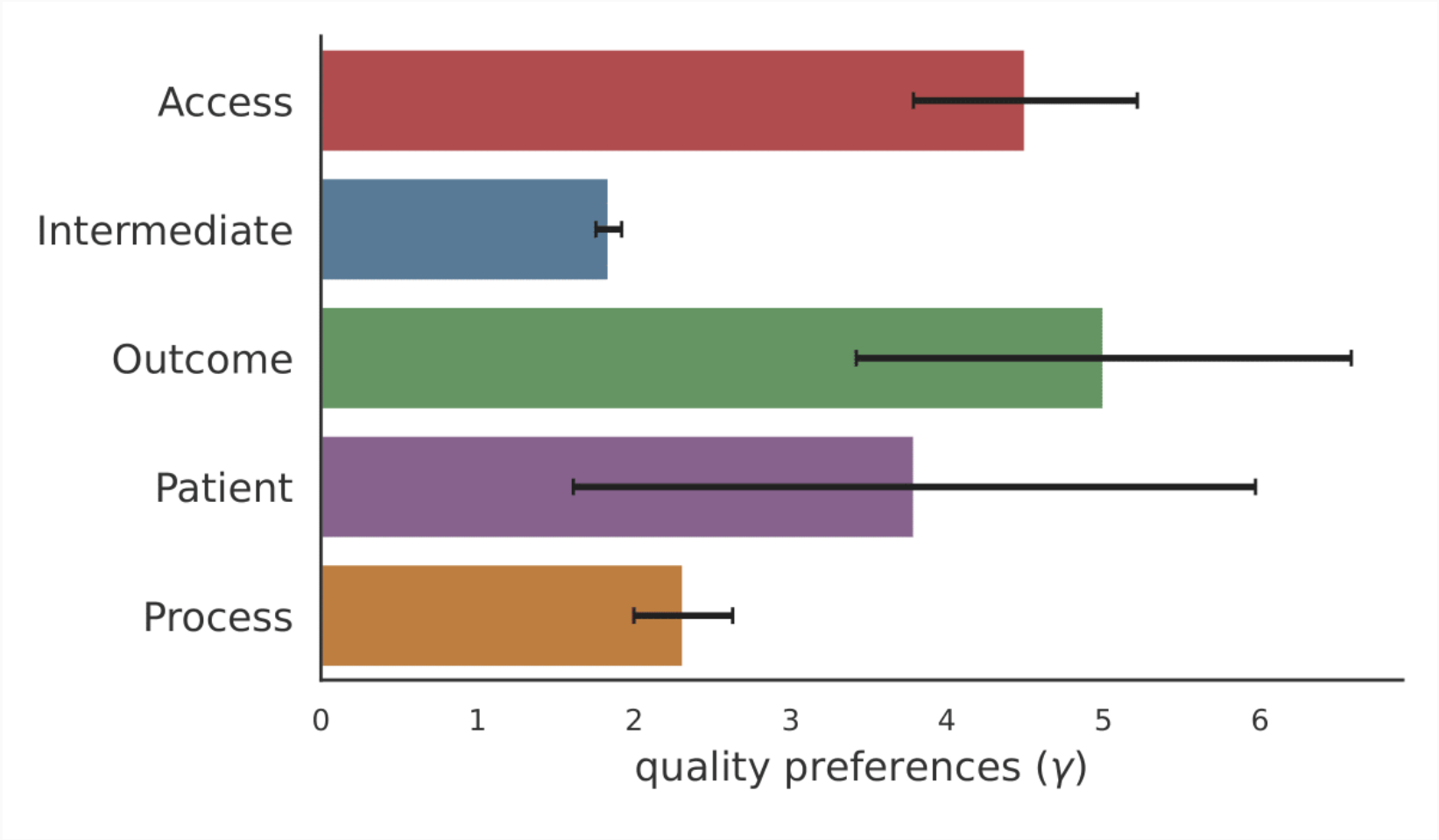
- Designer chooses scoring rule, ψ, from class of rules, $\boldsymbol{\Psi}$
- Trades off information for efficiency
- Paper shows that any monotone partitional score reduces to two elements: an aggregator and a cutoff function
- Considers optimal design among the set of designs with no more than 15 partitions and quadratic aggregators, setting $\rho^F = 1$ and $\rho^G = 0$, for year 2015

Question/concern

- Do optimal cutoffs and aggregator change in different years?
- With different ρ^F and ρ^G?
- No firm response to quality bonuses, but costs to CMS could be in ρ^G

Main results

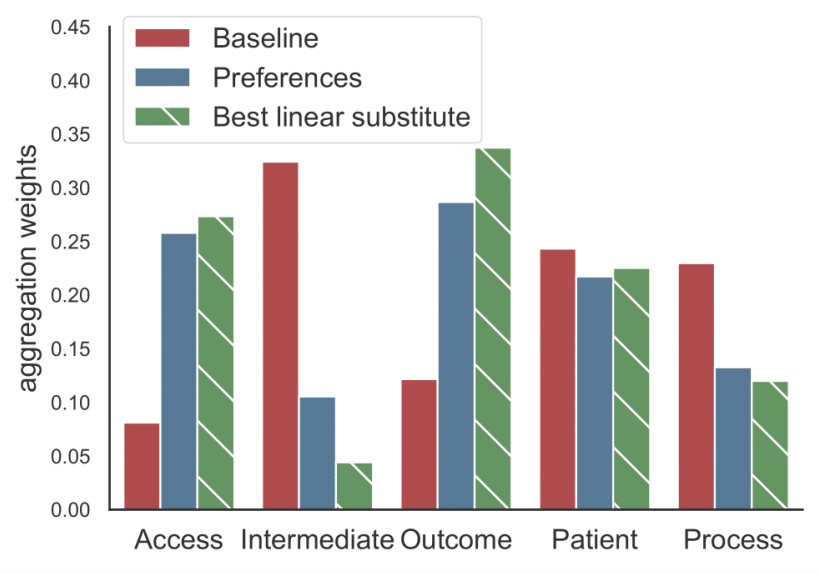
Demand

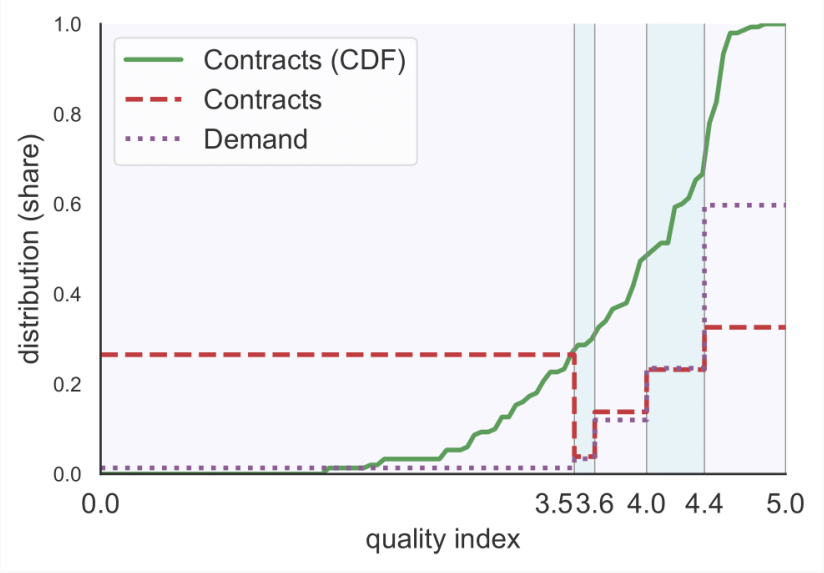

Access
Intermediate
Outcome
Patient
Process
0
1
2
3
4
5
6
quality preferences (γ)

Supply

Category	Insurance Costs, θ_q	Investment Costs, μ_k
Access	31.16	15.620*
Intermediate	108.40*	19.530*
Outcome	16.810*	15.000*
Patient	-244.30*	14.730*
Process	-175.60*	1.106

Scoring design

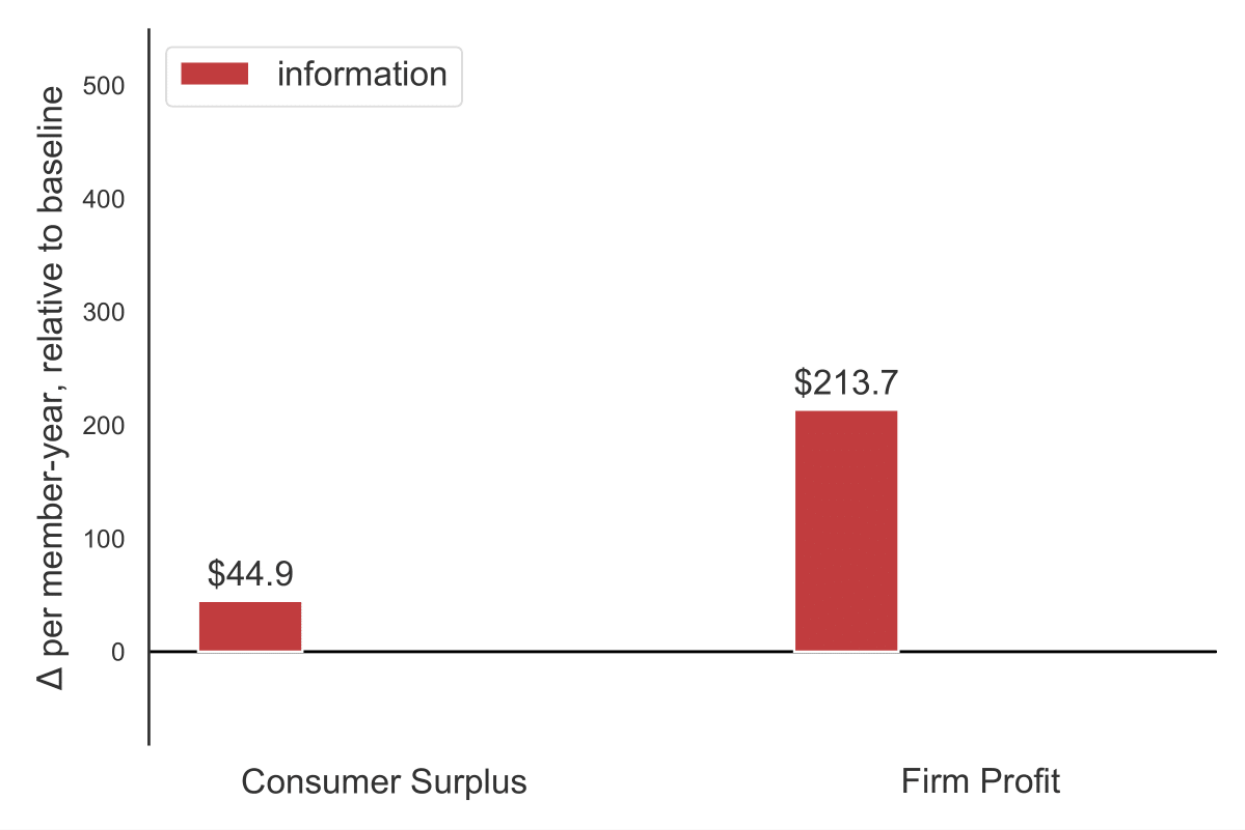




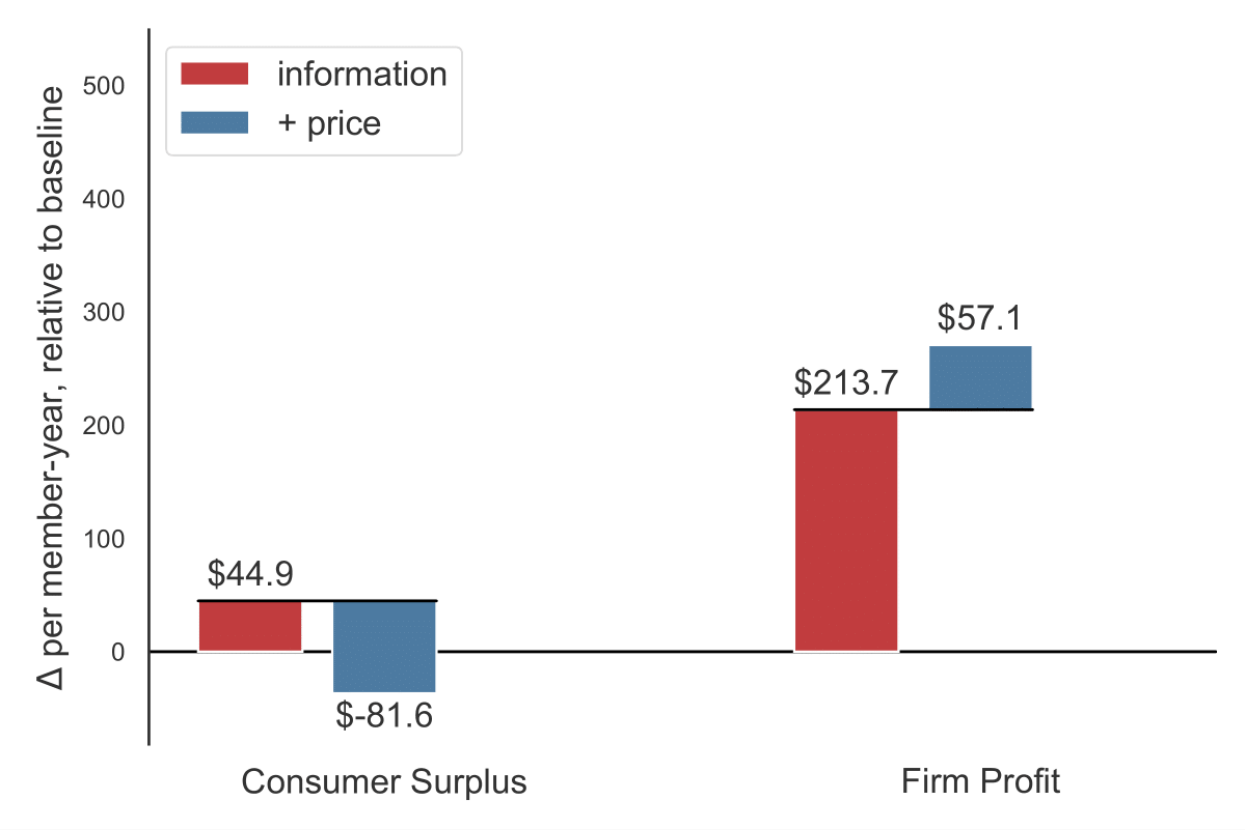
- Optimal design involves linear aggregator among 5 partitions
- Pooling at the bottom, with very little demand for low-quality plans
- Closely matches consumer WTP (except for Intermediate category?)
- **Question:** How much is 3.5 vs 3.6 just noise?

Scoring design with uninformed beneficiaries

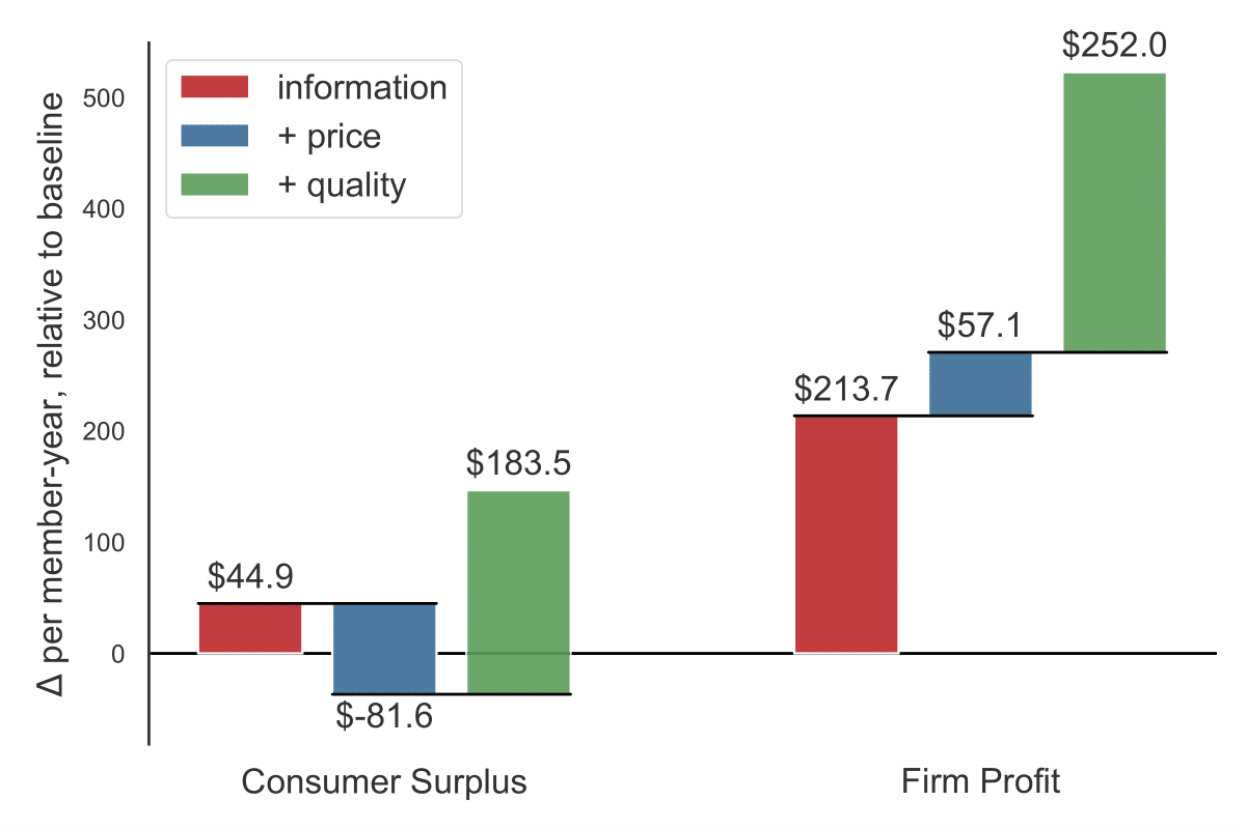
Welfare


information
Δ per member-year, relative to baseline
500
400
300
200
100
0
$44.9
$213.7
Consumer Surplus
Firm Profit

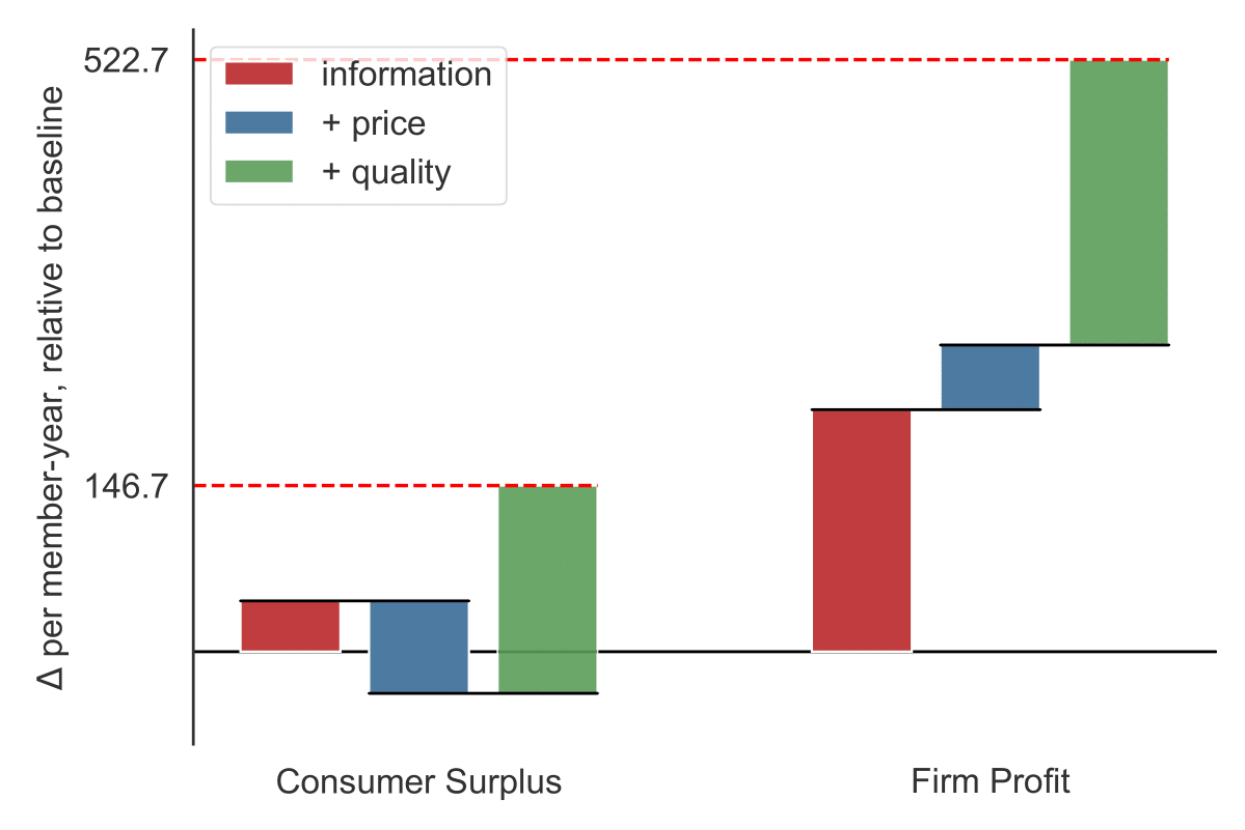
Welfare


information
+ price
Δ per member-year, relative to baseline
500
400
300
200
100
0
$44.9
$-81.6
$213.7
$57.1
Consumer Surplus
Firm Profit

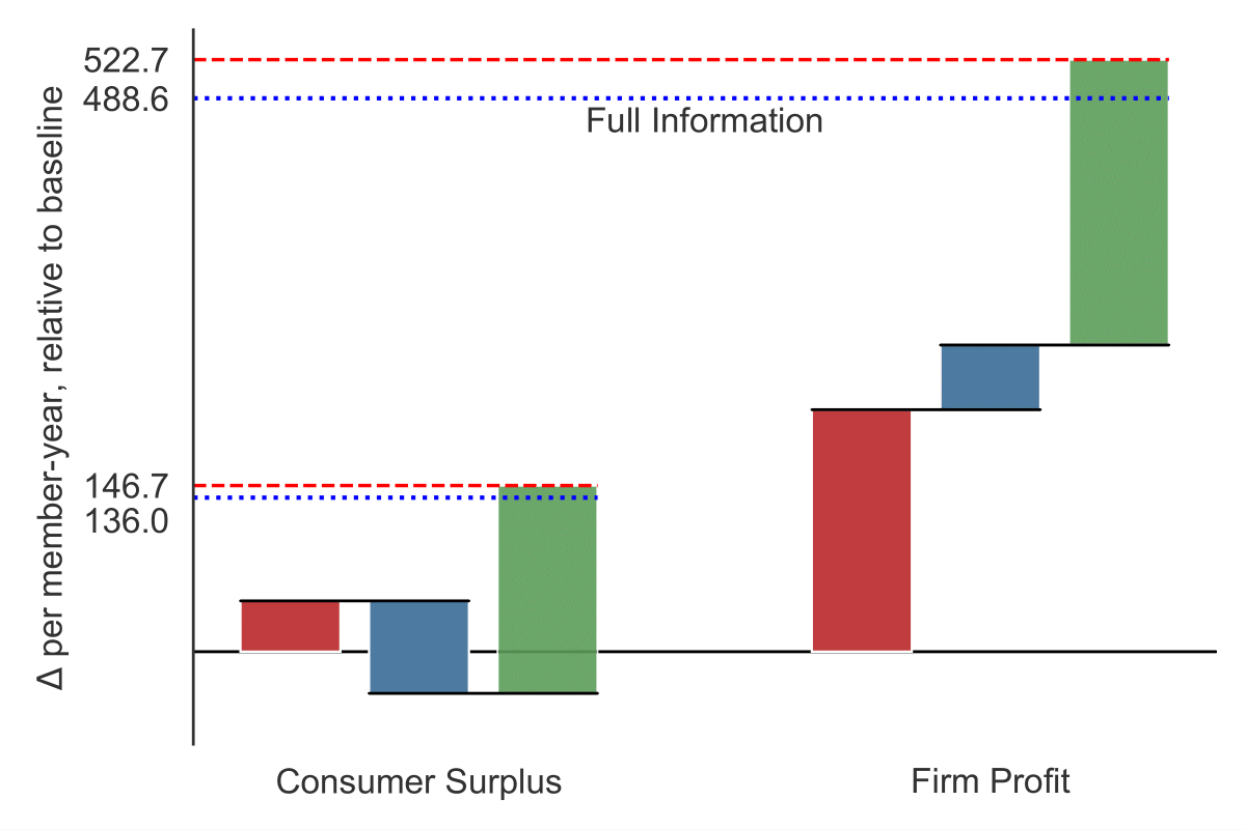
Welfare


information
+ price
+ quality
Δ per member-year, relative to baseline
500
400
300
200
100
0
$44.9
$-81.6
$183.5
$213.7
$57.1
$252.0
Consumer Surplus
Firm Profit

Welfare


522.7
146.7
information
+ price
+ quality
Δ per member-year, relative to baseline
Consumer Surplus
Firm Profit

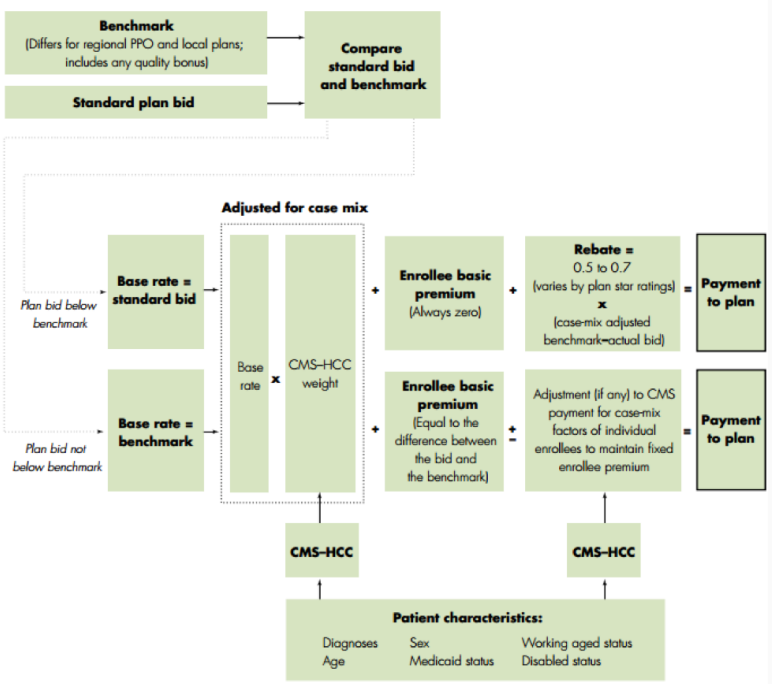
Welfare


522.7
488.6
Full Information
146.7
136.0
Δ per member-year, relative to baseline
Consumer Surplus
Firm Profit

Considerations for this paper

(not necessarily actionable)

The bid process



- Not just setting price
- Separate Part D bid process
- Ability to use Part C rebate to go toward Part D premium

Contracts vs plans

- Beneficiaries choose plans, defined by specific premium and benefits
- Quality is measured by contract
- Paper argues that there is really only one plan per contract
  - Makes sense in recent years but maybe not in early years
- Can't have it both ways
  - Price variation within contract good
  - but product differentiation within given quality score irrelevant?

Scoring design

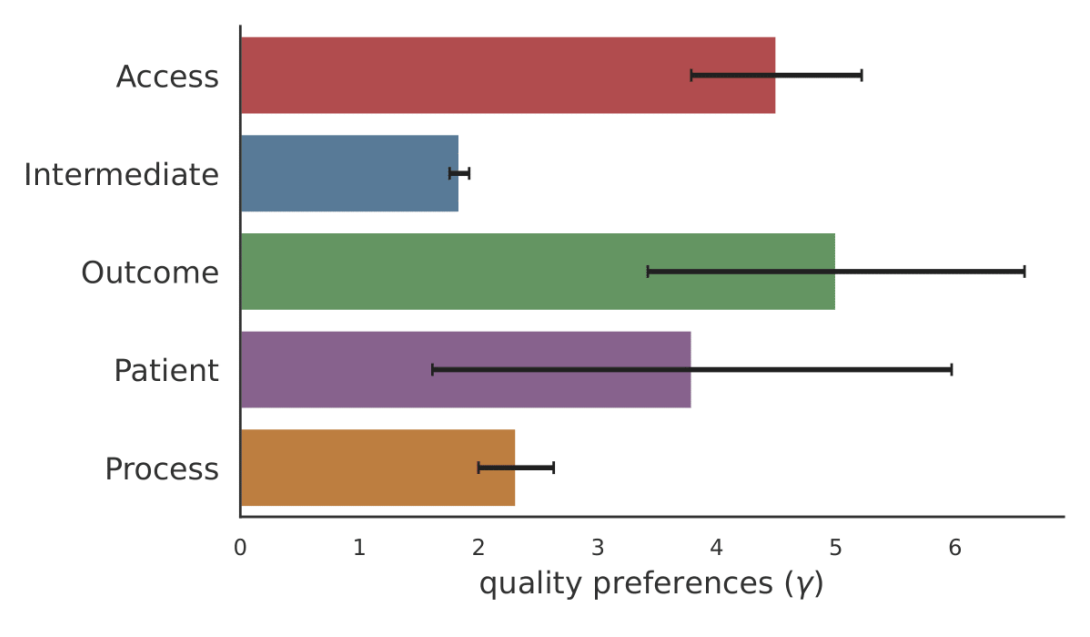
Does (should) the setup incorporate...

- Bonuses for high scores? **No**
- Contract consolidation of plans? **No**
- Part D quality? **No**
- Penalty for high-variance contracts (i-factor)? **Maybe**
- Alert for ratings below 3 stars or at 5 stars? **Maybe**

Scoring design

More fundamental questions...

- Are ratings reflective of quality?
- Is the rating monotonically increasing in underlying quality?



Considerations for more papers

1. Measuring quality

- What's the best way to measure the underlying quality score?
- Many of the current measures are provider (network) specific
- Relates to the *aggregator* in current framework, but would not take current categories (or construction of current categories) as given

2. Policy uncertainty

- Can some policy uncertainty avoid bunching just above the threshold values?
- How much policy uncertainty is optimal?
- How do insurers respond to such uncertainty?
- Already in the model: mapping between quality investments and the quality score
- Already in the data: introduction of new measures and publication of specific threshold values for some measures

3. Learning about scoring designs

- The scoring designs are complicated
- Likely takes time for insurers to understand the policy and update plans/contracts accordingly

Final thoughts