

Simulating Publicly Subsidized Reinsurance Strategies In Three States

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What is reinsurance?

- **Reinsurance is insurance for insurers.**
- **Key features:**
 - Band(s) of reinsured health expenditures
 - Levels for attachment, upper limit, and coinsurance
- **Public goals**

Introduction

Research Objective:

- Policy-makers in several states are considering publicly funded reinsurance for high-cost individuals.
- We produce individual-level, state-specific datasets for the purpose of simulating alternative publicly subsidized reinsurance strategies for three states.

Goal of simulation model

• Our goal is to estimate effects of policy alternatives on:

- Health insurance coverage
- Employer offer
- Health care expenditures
- State program costs

Why is reinsurance challenging to model at the state level?

- Data need to be population-based, representative of state health expenditures and coverage, demographic, employer characteristics.
- Need an accurate distribution of health expenses in the upper tail of the distribution across risk groups → sample size concerns.

Problem: There are no state datasets with those features.

Solution: Build a new state dataset suited to the task!

The two main parts of the simulation model

There are two major steps in creating our simulation model for reinsurance:

First, we model the baseline current state of insurance in State X.



Then, we model the effect of reinsurance on the baseline.



Baseline overview: From national to State-specific microdata

- 1. Start with national data**
 - Start with national, population-based microdata: Medical Expenditure Panel Survey-Household Component (MEPS-HC)
- 2. Adjust health expenditures**
 - Adjust expenditures to be consistent with National Health Accounts and high-cost claims data
- 3. Benchmark To State X**
 - Re-weight national data to match State X's characteristics as measured by the Current Population Survey (CPS) or by State X's survey
- 4. Create synthetic establishments**
 - Assign workers to synthetic employers to match State X's firm size/industry mix in Statistics of U.S. Businesses (SUSB)
- 5. Impute premiums**
 - Build up premiums from covered expenses, and benchmark to state premiums, e.g. MEPS-IC (Insurance Component).

Baseline database for State X is ready for simulating reinsurance programs

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Rewighted MEPS-HC: Insurance status for State X closely matches CPS data for State X

Category	ESI	Nongroup	Public	Uninsured
National MEPS-HC 2001-2003	62.9	4	19	14.4
CPS State X 2006	61.4	6	22.9	10.1
Reweighted MEPS-HC ≈ State X	61.5	6	22.8	10.1

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Reweighted MEPS-HC: Family income for State X closely matches CPS data for State X

Category	<100% FPL	100-199% FPL	200-399% FPL	400%+ FPL
National MEPS-HC 2001-2003	15.1	19.2	30	35.7
CPS State X 2006	14.4	17.1	32.6	35.9
Reweighted MEPS-HC ≈ State X	14.4	17.1	32.7	35.8

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Final reweighted baseline health expenditures for State X

Expenditure group	Total private health expenditures (in mil\$)	Percent of population
Up to \$2.5k	2,153	~35%
\$2.5k-\$5k	1,892	~30%
\$5k-\$10k	2,771	~45%
\$10k-\$15k	1,678	~35%
\$15k-\$30k	2,684	~40%
\$30k-\$50k	1,603	~30%
\$50k and up	3,941	~70%

Source: Reweighted MEPS-HC merged data 2001-2003.

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Last step for baseline data: construct initial ESI and NG premiums

- Employer Sponsored Insurance (ESI) premiums**
 - Using standardized covered expenses from adjusted MEPS expenditure data, blend covered expenses from an employer group with an overall book of business = "pure premium"
 - Add administrative loading factors by firm size
 - Compute the weighted average of single and family premiums within a firm's risk group to generate a firm-level average premium
- Nongroup (NG) premiums**
 - Establish cell rates for people with nongroup coverage, as a blend of actual standardized covered expenses and predicted covered expenses, plus administrative loading factors

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Application of reinsurance and flow of simulation model

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    graph TD
      A[Baseline data including initial premiums] --> B[1. Apply reinsurance policy]
      B --> C[2. Recompute ESI/NG premiums]
      C --> D[3. Recompute changes in firm's offer of ESI]
      D --> E[4. Recompute changes in "take-up" of ESI/NG]
      E --> F[5. Recompute ESI/NG premiums for new risk pool]
      F --> B
  
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Illustration of simulation model output for State X

This illustrates a modest reinsurance policy targeted towards the Nongroup and small group markets (those in firms with 50 or fewer employees).

	Policy target					Ripple effect from Nongroup
	Nongroup	ESI Firm Size <10	ESI Firm Size 10 to 24	ESI Firm Size 24 to 50	ESI Firm Size 50 to 99	ESI Firm Size 100+
% change in premium Single / Family	-13 / -22	-10 / -17	-18 / -14	-14 / -14	-2 / -1	-1 / -1
% change in offer	n/a	35	12	7	0	0
% point change in rate of uninsurance	n/a	-9	-6	-3	-2	-1

n/a = not applicable

Conclusions / Lessons so far

- State simulation modeling is feasible based on large national data sources.
- Role for qualitative analysis to fill uncertainties in simulation modeling, data limitations.
- This simulation analysis allows states to model different options, which highlights the relative benefits/costs
 - E.g. tradeoffs in setting options for policy parameters: eligibility rules, reinsurance thresholds, coinsurance levels

Extra slides:

Key Modeling Limitations

- Uncertainty remains in the magnitude of behavioral effects
- Model does not capture
 - Administrative costs, certain policy details, implementation issues
 - Benefit design issues, e.g. provider network
 - Certain insurer responses, e.g. number of insurers entering/exiting market
 - Insurer's underwriting behavior
- Due to data limitations, we cannot measure or model:
 - Whether a non-offering employer offered coverage in past 12 months
 - Certain reasons for having lost coverage (death of family member, termination/cancellation of COBRA coverage)
- This leaves a significant role for qualitative analysis

Simulating Changes in Coverage

- Use premium elasticity estimates from the literature for ESI offer, ESI take-up, and nongroup coverage
- Example: ESI take-up
 - Compute change in the probability of take-up based on: elasticity, initial probability of take-up, and percent change in premium
 - Simulate change in take-up by switching non-takers into takers if their new probability is greater than a random threshold
- This process is used in steps 4 and 5 in the general flow chart.
- The same process is used for determining firm-specific changes in the probability of offering coverage.