Estimating Medicaid Costs for Cardiovascular Disease: A Claims-based Approach

Presented by

Susan G. Haber, Sc.D[1]; Boyd H. Gilman, Ph.D.[1]

[1]RTI International

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RTI INTERNATIONAL

3040 Cornwallis Road ■ P.O. Box 12194 ■ Research Triangle Park, NC 27709

Phone 781-434-1721 Fax 781-434-1701 e-mail shaber@rti.org

Background

- Cardiovascular diseases (CVD) are leading causes of mortality and morbidity and pose substantial economic burden
- Medicaid serves populations at high risk for CVD
  - Low-income, minorities, elderly and disabled
- Rising Medicaid expenditures are an ongoing concern
  - Preventing CVD may provide an opportunity to reduce program costs

Study Questions

- What is the diagnosed prevalence of CVD in the adult Medicaid population?
  - Hypertension, heart disease, congestive heart failure (CHF), stroke
- What are the per capita medical costs associated with each disease?
- What is the financial burden of these diseases on state Medicaid programs?

Overview of Presentation

- Econometric model
- Data
  - Choice of states
- Criteria for identifying people with conditions
- Results
- Conclusions

Econometric Model

- Econometric approach to estimating disease costs
  - Use multivariate regression analysis to estimate marginal costs associated with a condition
- $ = *f* (sociodemographic characteristics, medical conditions, medical conditions*age)
  - Sociodemographic characteristics: gender, race, age, age^2, dual eligible, full benefit dual eligible
  - Cardiovascular conditions: hypertension, heart disease, CHF, stroke
  - Additional high prevalence or high cost conditions

Econometric Model (continued)

- Estimated separate models for annualized expenditures in 6 categories: inpatient, hospital OPD/ER, LTC, office-based, Rx, other
  - Combined results by service type to estimate effect on total expenditures
- Used alternative functional forms for regressions
  - OLS on $
  - 2-part GLM model: logit for p(use) and GLM on $ using gamma distribution and log link for those with use
  - 2-part lognormal model: logit for p(use) and OLS on log $ for those with use
- Models weighted by months of fee-for-service Medicaid eligibility
- Analyses restricted to adults

Medicaid Analytic Extract (MAX) File Data

- Uniform data set created by CMS based on claims and eligibility data submitted by all states since 1998
  - Analyses use data for 1999-2001
- 100% of Medicaid claims (inpatient, outpatient hospital, physician and other providers, long-term care, and Rx) and beneficiary information (age, gender, race, ZIP, eligibility)
- Supports state-specific cost estimates, including estimates for subpopulations
- Data tend to be incomplete for states with high Medicaid managed care enrollment

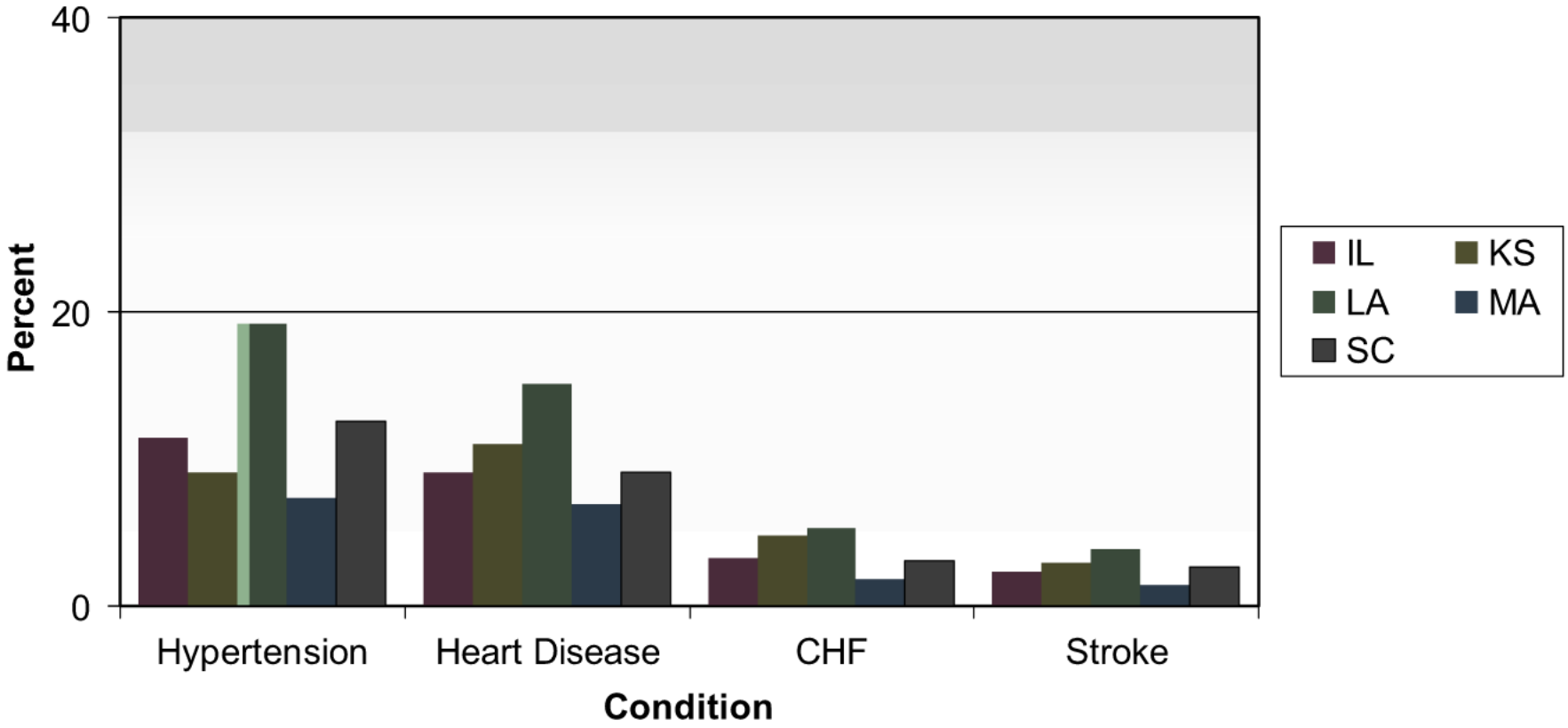
State Selection Criteria

- Data quality
  - Relatively low enrollment in capitated Medicaid managed care
  - Good reporting of diagnosis data (especially on crossover claims for dual eligibles)
- Population characteristics
  - Rates of CVD
  - Geographic variation
- Study states
  - IL (n=2,285,632)
  - KS (n=333,180)
  - LA (n=1,069,801)
  - MA (n=1,790,998)
  - SC (n=1,176,439)

Identifying Conditions

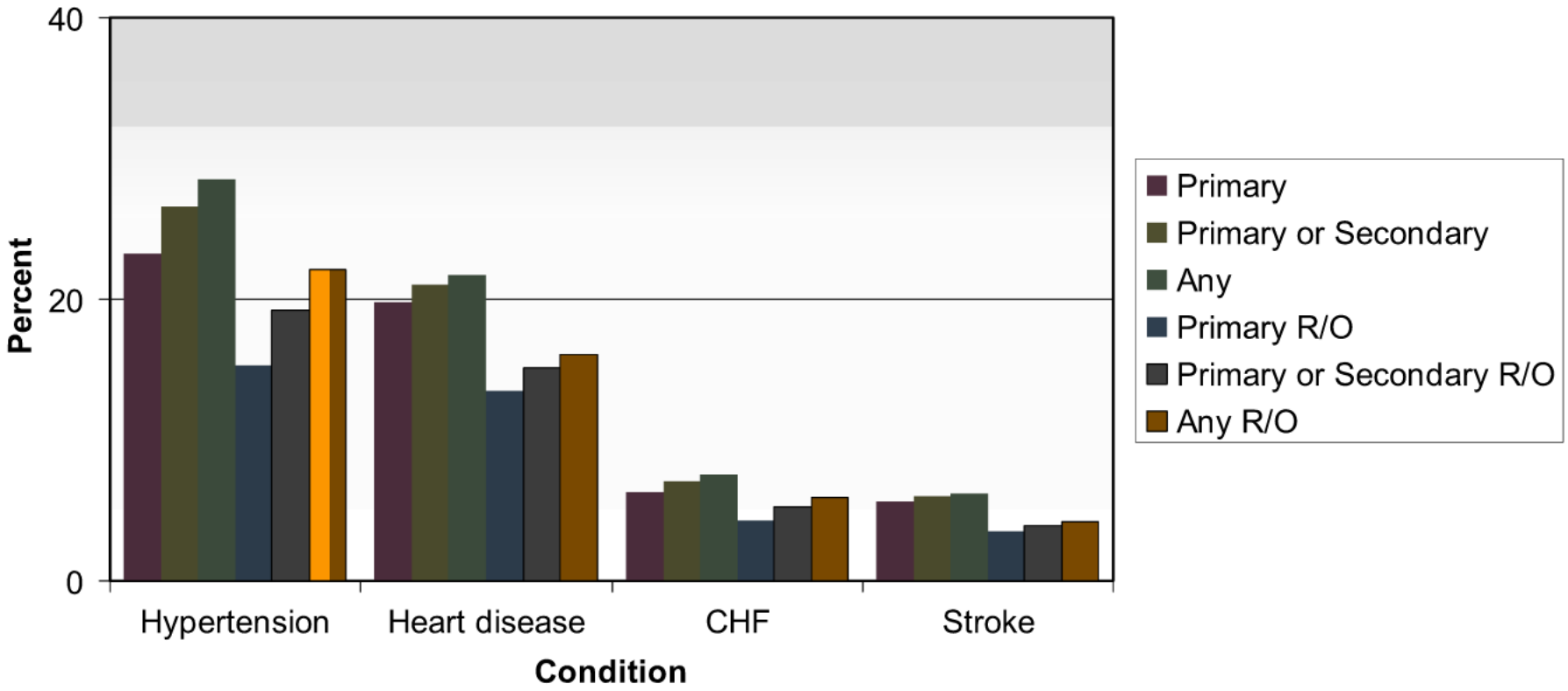
- Types of variables
  - Diagnosis codes
  - Prescription drug codes?
  - Lab tests?
- Number of diagnoses
  - Primary only, primary or secondary, any diagnosis code?
- Rule out criteria
  - Require claims on multiple dates
  - Single occurrence for inpatient, long-term care, and Rx claims

Prevalence of CVD by State (Primary or Secondary Dx with Rule Out)



NOTE: Data are weighted by months of fee-for-service Medicaid coverage.

Prevalence of CVD in LA by Criteria Used to Identify Condition



NOTE: Data are weighted by months of fee-for-service Medicaid coverage.

Per Capita Costs Due to CVD: OLS Results (Primary or Secondary Dx with Rule Out)

	Hypertension	Heart Disease	CHF	Stroke
IL	283	5,214	6,749	13,163
KS	285	2,925	4,257	8,733
LA	-698	1,675	2,718	6,618
MA	-2,262	405	3,684	8,818
SC	-479	2,248	2,005	6,507

NOTE: Data are weighted by months of fee-for-service Medicaid coverage.

Percent of Costs Due to CVD: OLS Results (Primary or Secondary Dx with Rule Out)

	Hypertension	Heart Disease	CHF	Stroke
IL	0.3	4.9	2.3	3.2
KS	0.2	2.5	1.6	2.0
LA	-1.8	3.4	1.9	3.5
MA	-1.9	0.3	0.7	1.4
SC	-1.1	3.9	1.2	3.3

NOTE: Data are weighted by months of fee-for-service Medicaid coverage.

Per Capita Costs Due to CVD in LA by Identification Criteria

	Primary	Primary or Secondary	Any	Primary R/O	Primary or Secondary R/O	Any R/O
Hypertension	-1,447	-1,294	-1,151	-885	-698	-522
Heart disease	1,675	1,693	1,711	1,716	1,675	1,680
CHF	2,509	2,567	2,703	2,692	2,718	2,880
Stroke	5,751	5,677	5,670	6,709	6,618	6,520

NOTE: Data are weighted by months of fee-for-service Medicaid coverage.

Conclusions

- Prevalence, per capita costs, and percent of total costs vary by state
- Estimates are sensitive to how conditions are defined
  - Rule out criteria especially important
- Cost estimates lower than expected
  - High proportion of dual eligibles
  - Controls for comorbid conditions
  - Long-term care

Next Steps

- Generate boot-strapped standard errors
- Develop estimates by year
- Develop estimates for subpopulations
  - Medicare dual eligibility status
  - Sociodemographic groups (age, race/ethnicity, gender)
  - Local area of residence (urban/rural, county)
- Estimate models without controls for comorbidities