Consumer Driven Health Plans:

Does Theory Follow Practice?

Stephen T Parente, Ph.D.
Associate Professor of Finance and
Director, Medical Industry Leadership Institute
University of Minnesota, Carlson School of Management

Sponsored by the Robert Wood Johnson Foundation's Health Care Financing & Organization Initiative (HCFO), the U.S. Department of Health and Human Services and Pfizer

CARLSON
SCHOOL OF MANAGEMENT
UNIVERSITY OF MINNESOTA

Presentation Overview

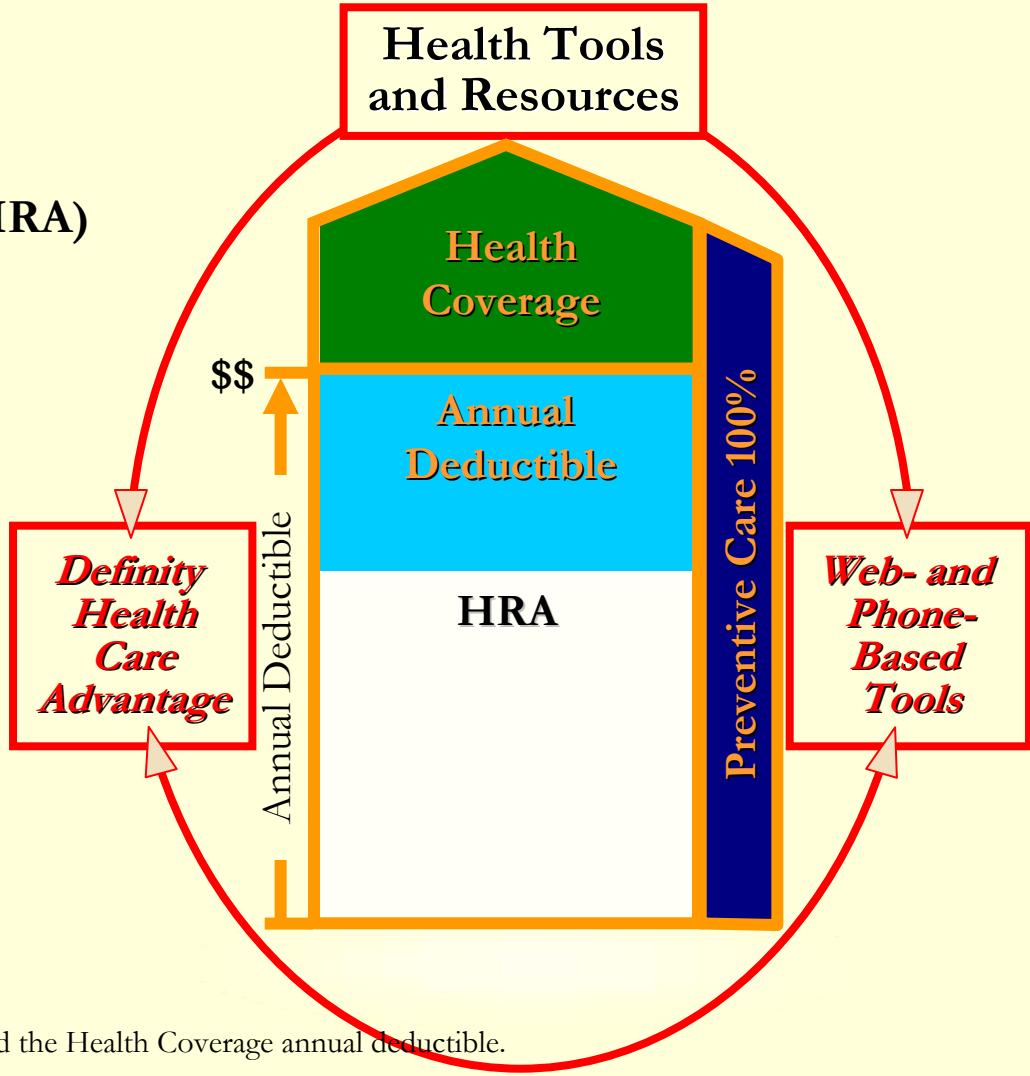
- What is (or at least what we see and model) a consumer directed health plan?
  - General introduction and preliminary research findings
- Graphic conceptual model of consumer behavior
  - CDHP cost-sharing design creates a budget constraint with 2 kinks
  - Contrast with 'standard' health insurance that uses coinsurance or deductible
  - Determine expected effects on enrollee behavior
- So is there a difference?

‘Classic’ CDHP Model – HRA

Health Reimbursement Account (HRA)
- Employer allocates HRA[1]
- Member directs HRA
- Roll over at year-end
- Apply toward deductible[2]

Health Coverage
- Preventive care covered 100%
- Annual deductible
- Expenses beyond the HRA

Health Tools and Resources
- Care management program
- Internet enabled

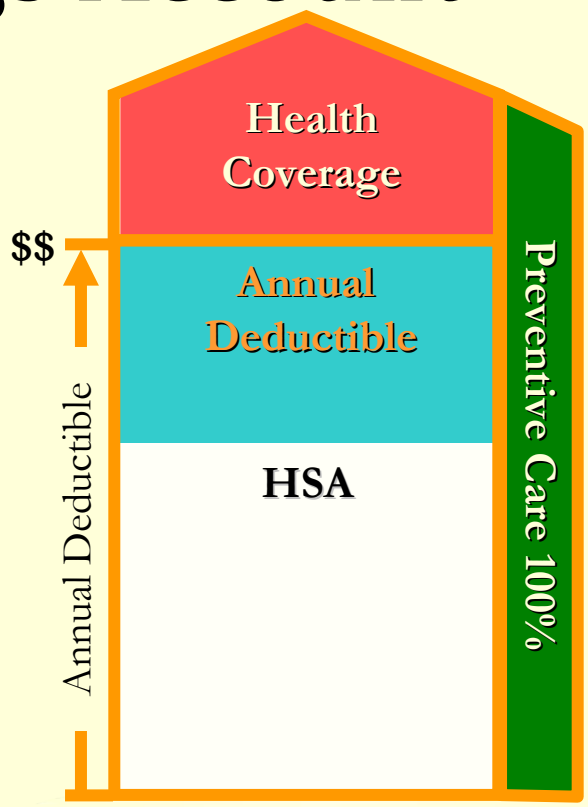


[1] Employer selects which expense apply toward the Health Coverage annual deductible.
[2] Paid out of employer’s general assets.

CDHP Version 2.0: The Health Savings Account (HSA)

HSAs legislated in MMA 2003.

Pretty similar to Definity Health HRA Design except the consumers owns the account.



Questions Addressed from Previous Peer-Reviewed Academic Research

- Do CDHPs (in the form of HRAs) have national appeal?
  - **Yes.** In almost every major market, when introduced, take-up exceeded 5% of employees offered (range 4% to 85%).
- Do CDHPs always have favorable selection?
  - **No.** While there is some evidence of initial favorable selection in one employer, it does not persist. (Parente, Feldman, Christianson, 2004)
- Do CDHPs have different effects on cost & utilization compared to other plans?
  - **Yes.** Results depend on benefit generosity. Long run costs are not less with a generous plan. (Parente, Feldman, Christianson, 2004). For less generous plans, preliminary evidence suggest reduction in rate of increase.
  - Biggest cost impact on pharmacy (least cost increase – Parente, Feldman, Chen, 2007). Little impact on utilization.
- Are HSAs a viable approach to addressing the problem of the uninsured?
  - **Yes.** But it is still more a political economy question of budgetary priority. Reductions range from 3 million to 25 million newly insured with federal costs as high as $100 billion per year. (Feldman, Parente, Abraham, 2005).

What We Don't Know?

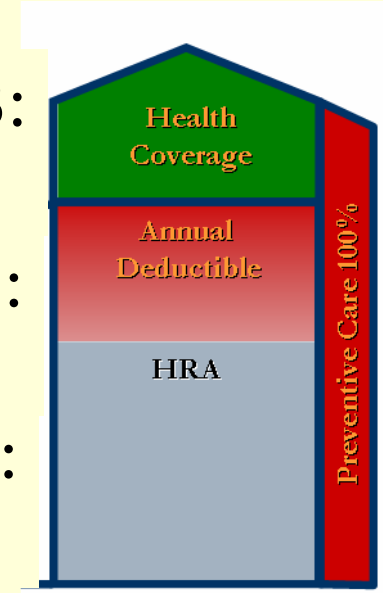
- Do Consumers Respond to the Actual Financial Incentives of a CDHP design?
  - Incentive #1 – Variation in the Price of Medical Care
    - Depends on:
      - Contract (single, family)
      - Cost-sharing components (deductible, co-insurance, actual account
      - Transparency of price
      - Ability to shop for better price
  - Incentive #2 – Save resources in possible for later use
    - Depends on:
      - Health status
      - Income & wealth
      - Risk aversion
      - Preventive care availability and generosity

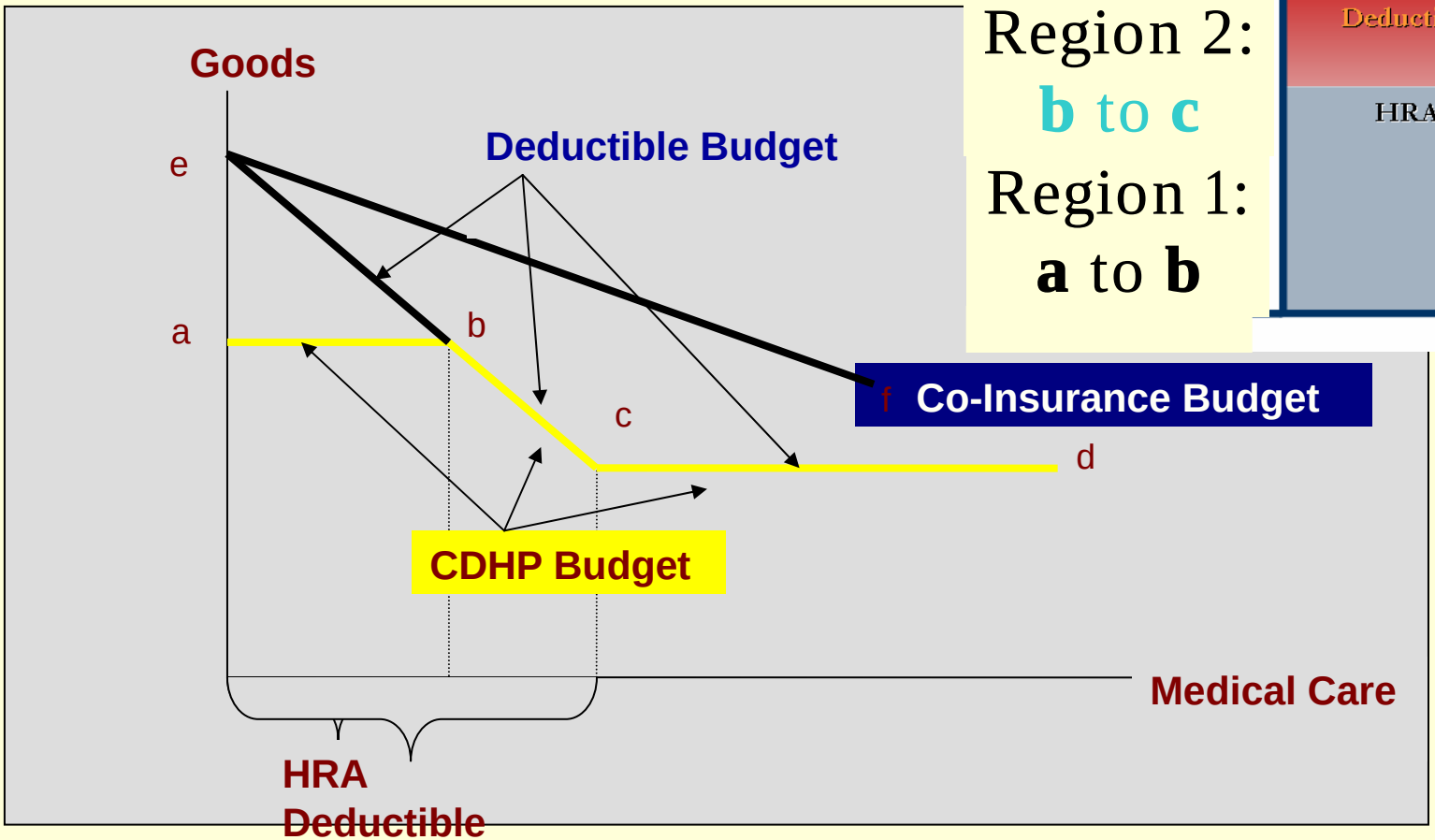
Graphic Conceptual Models: CDHP, (C)oinsurance and a (D)eductible Health Plan

Region 3:
c to **d**

Region 2:
b to **c**

Region 1:
a to **b**





Predicted Spending by Budget Region

Region 1 – predicted spending less than employer contribution to HRA	Region 2 – predicted spending above HRA but below deductible	Region 3 – predicted spending above deductible
D-plan lowest C-plan and **CDHP** higher with uncertain order	D-plan = **CDHP** < **C-plan**	D-plan = **CDHP** = **C-plan**

Data to Test Hypotheses

- Large employer added a CDHP to previously-offered PPO and POS Plans in 2001
- Quasi-experimental pre/post design
- We selected 3 cohorts of workers continuously employed from 2000-2003:
  - Always in PPO
  - Always in POS
  - PPO or POS in 2000, switched to CDHP in 2001 and stayed in CDHP 2002 and 2003

Plan Characteristics

PLAN CHARACTERISTIC	CDHP	POS and PPO
Employer HRA contribution	$1,000 single $1,500 2-person $2,000 family	Not applicable
Deductible	$1,500 single $2,250 2-person $3,000 family	None
Coinsurance/Co-pay	None	$15 office visit co-pay $100 inpatient co-pay
Rx coverage	Same as other covered services	$10 generic $20 formulary brand $30 non-formulary brand
Preventive Care	100% covered	100% covered
Stop-loss limit	$500 single $750 2-person $1,000 family	$1,500 person (POS) $3,000 family (POS) $1,000 person (PPO) $2,000 family (PPO)

Empirical Model – Step 1

- Predict employee's 2000 spending region on the basis of cohort, contract-level, and employee demographic data
  - Cohort stands in for unmeasured variables that affect spending
  - Control for health status using indicators for 34 'adjusted diagnostic groups' (Starfield and Weiner, 1991)

Predicted 2000 Spending Regions by Cohort

COHORT	NUMBER of OBS.	PROBABILITY OF REGION	
CDHP	429	1	0.548
		2	0.118
		3	0.333
POS	1,249	1	0.473
		2	0.126
		3	0.401
PPO	1,025	1	0.465
		2	0.135
		3	0.400

2001-2003 Cost Models – Step 2

- We estimated 2-part models for total $, physician $, Rx $, and proportion of Rx $ on brand-name drugs
- 1st part = probit analysis of any $
- 2nd part = log($ | $>0)
- Models include predicted region x Cohort
- Will present ‘key’ results
- ALL RESULTS COMPARED to PPO OPTION

Total Expenditure

	PROBIT				CONDITIONAL ln(TOTAL EXPENDITURE)			
VARIABLE	COEF.	SE	CHI-SQUARE	Pr > CHI-SQUARE	COEFF.	SE	t-VALUE	Pr > t
POS x REGION2	0.6373	0.2808	5.1499	0.0232	0.42986	0.07023	6.12	<.0001
POS x REGION3	1.1411	0.28	16.6112	<.0001	0.65593	0.04124	15.91	<.0001
CDHP x REGION1	-0.2248	0.1067	4.4411	0.0351	-0.11645	0.05238	-2.22	0.0262
CDHP x REGION2	NA	NA	NA	NA	0.58771	0.12028	4.89	<.0001
CDHP x REGION3	NA	NA	NA	NA	0.76523	0.06473	11.82	<.0001

Regressions control for year, age, male, income, covered lives, FSA use, concurrent 'health shock'; omitted category = POS x REGION1

Translation: CDHP cohorts uses less of any medical or pharmacy in the account phase only. This leads to an 11.6% reduction in expenditures compared to a PPO. Once all cost-sharing is satisfied, CDHP members have 76% higher expenditures then PPO.

Physician Expenditure

	PROBIT				CONDITIONAL ln(PHYSICIAN EXPENDITURE)			
VARIABLE	COEF.	SE	CHI-SQUARE	Pr > CHI-SQUARE	COEFF.	SE	t-VALUE	Pr > t
POS x REGION2	0.2155	0.2096	1.0575	0.3038	0.33135	0.062	5.34	<.0001
POS x REGION3	1.2256	0.2759	19.7412	<.0001	0.56323	0.03625	15.54	<.0001
CDHP x REGION1	-0.3139	0.1	9.8515	0.0017	-0.02513	0.04642	-0.54	0.5883
CDHP x REGION2	NA	NA	NA	NA	0.5407	0.1056	5.12	<.0001
CDHP x REGION3	3.8598	83.4919	0.0021	0.9631	0.67332	0.0569	11.83	<.0001

Regressions control for year, age, male, income, covered lives, FSA use, concurrent 'health shock'; omitted category = POS x REGION1

Translation: People use less of any physician services in the account phase, but not enough to effect expenditures.

Rx Expenditure

	PROBIT				CONDITIONAL ln(PHARMACY EXPENDITURE)			
VARIABLE	COEF.	SE	CHI-SQUARE	Pr > CHI-SQUARE	COEFF.	SE	t-VALUE	Pr > t
POS x REGION2	0.6052	0.1467	17.0323	<.0001	0.4581	0.09006	5.09	<.0001
POS x REGION3	0.809	0.0978	68.4763	<.0001	0.74921	0.05297	14.14	<.0001
CDHP x REGION1	-0.2011	0.0714	7.9363	0.0048	-0.35918	0.07034	-5.11	<.0001
CDHP x REGION2	1.2198	0.4054	9.0515	0.0026	0.23713	0.1518	1.56	0.1183
CDHP x REGION3	0.4822	0.1516	10.1168	0.0015	0.66084	0.08266	7.99	<.0001

Regressions control for year, age, male, income, covered lives, FSA use, concurrent 'health shock'; omitted category = POS x REGION1

Translation: CDHP cohorts uses less of any pharmacy in the account phase only. This leads to an 35.9% reduction in Rx expenditures compared to a PPO. Once all cost-sharing is satisfied, CDHP members have 66% higher Rx expenditures then PPO.

Brand Name Rx Proportion

VARIABLE	COEFFICIENT	SE	t-VALUE	Pr > t
POS x REGION2	0.07377	0.01747	4.22	<.0001
POS x REGION3	0.02545	0.01028	2.48	0.0133
CDHP x REGION1	0.07243	0.01365	5.31	<.0001
CDHP x REGION2	0.15826	0.02945	5.37	<.0001
CDHP x REGION3	0.11147	0.01604	6.95	<.0001

Regressions control for year, age, male, income, covered lives, FSA use, concurrent 'health shock'; omitted category = POS x REGION1

Translation: CDHP cohort has a higher probability of any brand name drug use in all expenditure regions compared to PPO.

Summary of Findings (1)

- CDHP enrollees predicted to be 'low spenders' consistently spent less in following years than a comparison group with conventional cost sharing
  - This difference was found in all probit equations and for cases with positive total expenditure and Rx expenditure
- This finding is striking because CDHP enrollees had no cost-sharing in this region
  - HRA account provides insurance against future expenses

Summary (2)

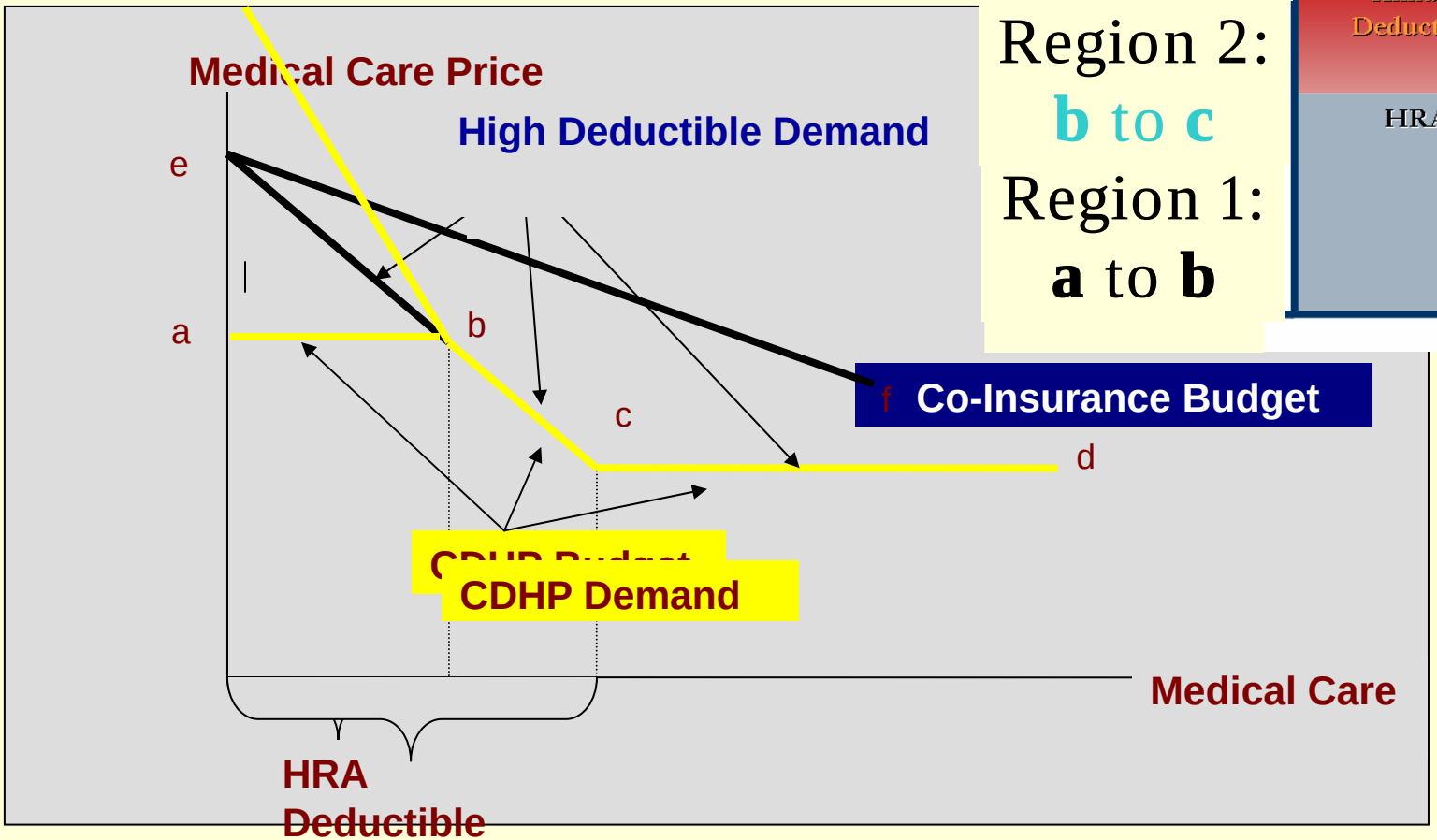
- CDHP enrollees predicted to be in Region 2 or 3 spent more than the comparison POS group
  - This finding is similar to our previous cohort study in 2001 and 2002 (Parente, Feldman, Christianson, 2004)
  - CHDP enrollees in Region 3 have used their accounts and face no cost-sharing at the margin → no incentive to conserve on medical care
- The maximum out-of-pocket limit is too low
  - Problem could be addressed by raising the limit and introducing modest coinsurance above the limit

Graphic Conceptual Models: REVISED CDHP, (C)oinsurance and a (D)eductible Health Plan

Region 3:
c to **d**

Region 2:
b to **c**

Region 1:
a to **b**



“But what do you have that is current?”

What Happens When You Can Choose between an HSA, an HRA, an HMO, a PPO, EPO or a POS plan?

2006 Plan Choice Year, 2005 Risk Data

Study Setting

- Employer with many different plan design offers in 2006 including:
  - CDHP: HSA, HRA High, HRA Not-High
  - PPO, POS, EPO, 1 or 2 HMOs in some locations
- Non-retiree analysis only.
- Employees live in all 50 states. Over 100 employees in 22 states.
- Health risk (including measure of chronic illness) based on 2005 pharmacy claims data.

Plan Design Attributes

- Four contract types:
  - Single
  - 2 Person
  - Adult + Child
  - Family
- CDHP Design
  - HRA High: Coinsurance at 5%, Smaller donut
  - HRA Low: Coinsurance at 10%, Larger donut
  - HSA – More out of pocket risk
- Non-CDHP Design: Moderate coinsurance (average 10%)

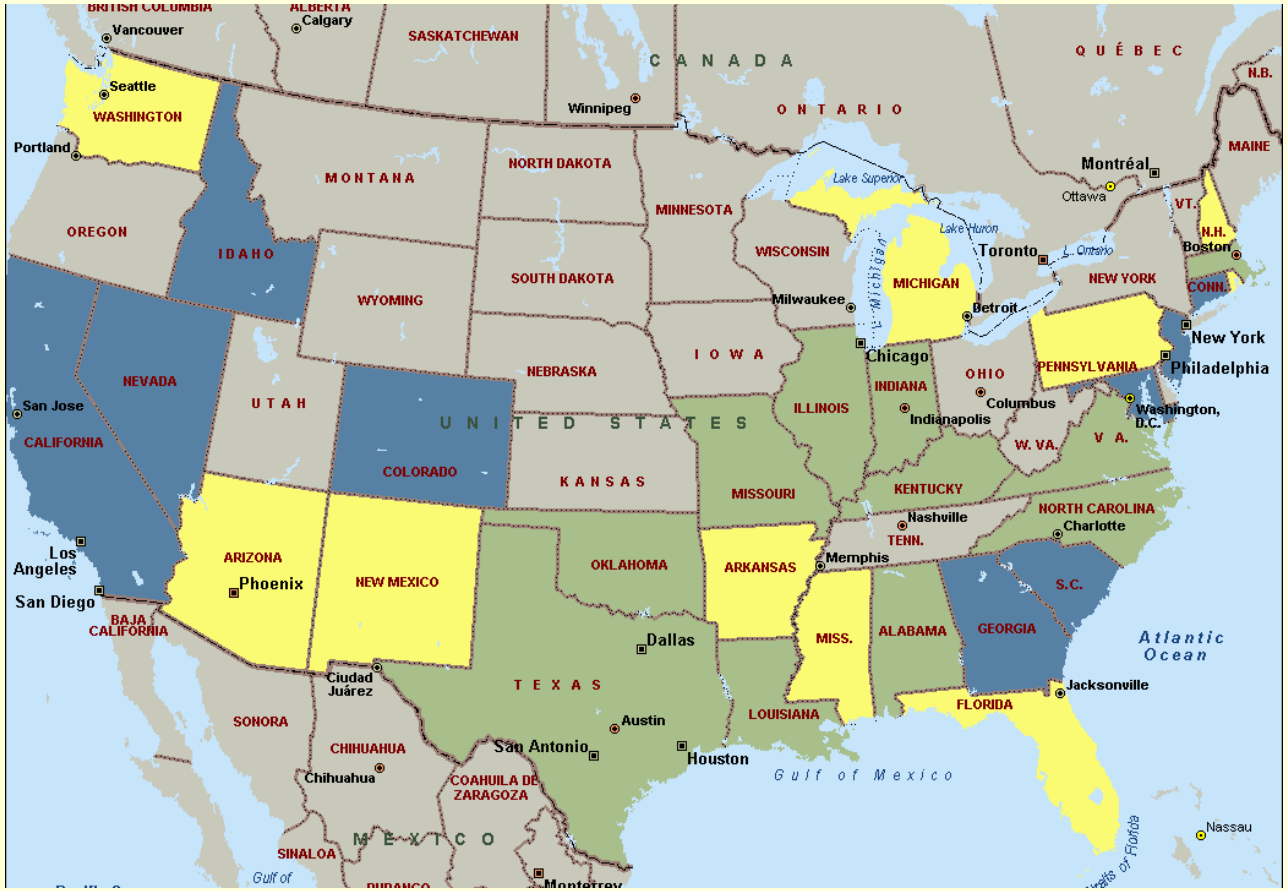
Attributes of Plan Choosers

Plan Designs	Age	% Female	Risk Ratio
All Plans	45.8	26.9%	1.00
EPO - Exclusive Provider Organization	44.9	31.0%	1.16
Primary HMO	43.5	28.2%	0.48
Secondary HMO	45.1	27.3%	0.91
HRA High	46.9	29.4%	1.24
HRA Low	41.5	22.9%	0.73
HSA w/High Deductible	40.3	18.6%	0.57
POS - Point of Service	47.4	23.6%	1.22
PPO - Preferred Provider Organization	46.2	27.2%	0.71

Notes:

- 2006 Plan choice data
- Risk ratio based on computation from 2005 pharmacy data
- Primary HMO Rx data may be under-represented

HSA Take Up – 2006



Take-up

- 2.7-5.6%
- 1.4 – 2.6%
- <1.4%

Data based on 1 large employer representing ~50,000 covered lives with HSA initial year offering in 2006.

CDHP Take Up – 2006

Take-up

- 11-39%
- 7.5 – 10%
- <7.5%

Data based on 1 large employer representing ~50,000 covered lives with HSA initial year offering in 2006 along with low and high HRAs.

HSA/PPO Risk Ratio

HSA/PPO Ratio

- 1.0-2.6
- 0.75 – 0.99
- <0.75

Data based on 1 large employer representing ~50,000 covered lives with HSA initial year offering in 2006.

Risk Score based 2005 Claims data analysis using RxRisk

HRA High/PPO Risk Ratio

HSA/PPO Ratio

- 1.0-3.7
- 0.75 – 0.99
- <0.75

Data based on 1 large employer representing ~50,000 covered lives with HSA initial year offering in 2006.

Risk Score based 2005 Claims data analysis using RxRisk

Summary of HSA Choice when HRA and PPO are Also Choices

- Risk-splitting between HRA and HSA
- Clearly an issue of benefit design.
- Is the risk segmentation of value? Is too difficult to fix short of full-replacement?

Thank You!

For more information on our research, please visit:

www.ehealthplan.org

Stephen T. Parente, Ph.D., M.P.H., M.S.
Associate Professor, Department of Finance
Director, Medical Industry Leadership Institute
Carlson School of Management
University of Minnesota
321 19th Ave. South, Room 3-122
Minneapolis, MN 55455
612-624-1391 (v), sparente@csom.umn.edu
http://www.tc.um.edu/~paren010