

Public Economics: Lecture 8

Health Insurance

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Health insurance in the U.S.

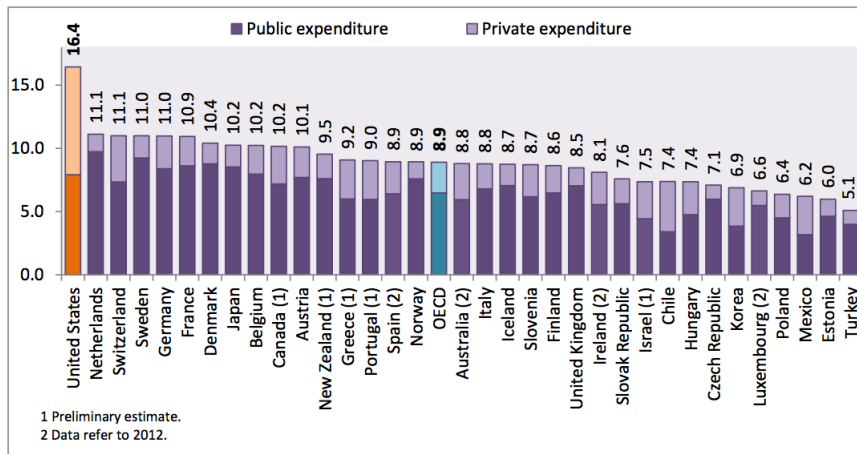
- Despite the high quality of care for high-end medical procedures, many problems within U.S. health care system
 - ▶ Health care very expensive: 16.4% of GDP, which is very large by international standards
 - ▶ Significant fraction of the population remains uninsured: 15.7% uninsured in 2010 (pre-reform) vs. 9.1% in 2015 after ACA phased in
 - ▶ Large disparities in medical outcomes across groups: infant mortality is 0.6% for whites but 1.3% for blacks
- Even after ACA-related Medicaid expansions the majority of health insurance ($> 70\%$) in the U.S. is privately provided \implies both adverse selection and moral hazard issues
- Among those covered through private insurance $> 85\%$ of contracts supplied by the employer

Health insurance in other OECD countries

- In all OECD countries besides the U.S. there is universal health insurance – govt. pays for care when individuals become sick
- Typically funded through tax revenues
- For some countries (Germany, France, Japan) employers/employees share a payroll tax that goes towards regulated sickness funds
- Government either directly controls doctors and hospitals (UK), or reimburses private health care providers (France)
- Government limits costs and over-consumption of health services by...
 - ▶ Regulating allowed treatments: picks treatments based on cost effectiveness, bargains for prices, rations care
 - ▶ Imposing co-payments: patients pay a portion of the cost of their health services

Health care spending in OECD countries

Figure 2. Health spending* as a share of GDP, 2013



* Excluding capital expenditure.

Source: OECD Health Statistics 2015

Sources of health coverage in the U.S., 2013 – 2015

Coverage type	2013				2014				2015				Change			
													2015 less 2014		2015 less 2013	
	Number	MOE ¹ (±)	Rate	MOE ¹ (±)	Number	MOE ¹ (±)	Rate	MOE ¹ (±)	Number	MOE ¹ (±)	Rate	MOE ¹ (±)	Number	Rate	Number	Rate
Any health plan	271,606	636	86.7	0.2	283,200	568	89.6	0.2	289,903	650	90.9	0.2	*6,702	*1.3	*18,297	*4.3
Any private plan ^{2,3}	201,038	1,140	64.1	0.4	208,600	1,221	66.0	0.4	214,238	1,118	67.2	0.4	*5,639	*1.2	*13,201	*3.0
Employment-based ²	174,418	1,160	55.7	0.4	175,027	1,188	55.4	0.4	177,540	1,229	55.7	0.4	*2,513	0.3	*3,122	Z
Direct-purchase ²	35,755	615	11.4	0.2	46,165	798	14.6	0.3	52,057	916	16.3	0.3	*5,891	*1.7	*16,302	*4.9
Any government plan ^{2,4}	108,287	1,115	34.6	0.4	115,470	1,035	36.5	0.3	118,395	1,067	37.1	0.3	*2,924	*0.6	*10,107	*2.6
Medicare ²	49,020	377	15.6	0.1	50,546	339	16.0	0.1	51,865	308	16.3	0.1	*1,319	*0.3	*2,845	*0.6
Medicaid ²	54,919	969	17.5	0.3	61,650	931	19.5	0.3	62,384	917	19.6	0.3	734	0.1	*7,465	*2.0
Military health care ^{2,5}	14,016	595	4.5	0.2	14,143	568	4.5	0.2	14,849	626	4.7	0.2	706	0.2	833	0.2
Uninsured ⁶	41,795	614	13.3	0.2	32,968	561	10.4	0.2	28,966	634	9.1	0.2	*-4,002	*-1.3	*-12,829	*-4.3

* Changes between the estimates are statistically different from zero at the 90 percent confidence level.

Z Represents or rounds to zero.

¹ A margin of error (MOE) is a measure of an estimate's variability. The larger the MOE in relation to the size of the estimate, the less reliable the estimate. This number, when added to and subtracted from the estimate, forms the 90 percent confidence interval. MOEs shown in this table are based on standard errors calculated using replicate weights. For more information, see "Standard Errors and Their Use" at <www2.census.gov/library/publications/2016/demo/p60-257sa.pdf>.

² The estimates by type of coverage are not mutually exclusive; people can be covered by more than one type of health insurance during the year.

³ Private health insurance includes coverage provided through an employer or union, coverage purchased directly by an individual from an insurance company, or coverage through someone outside the household.

⁴ Government health insurance coverage includes Medicaid, Medicare, TRICARE, CHAMPVA (Civilian Health and Medical Program of the Department of Veterans Affairs), and care provided by the Department of Veterans Affairs and the military.

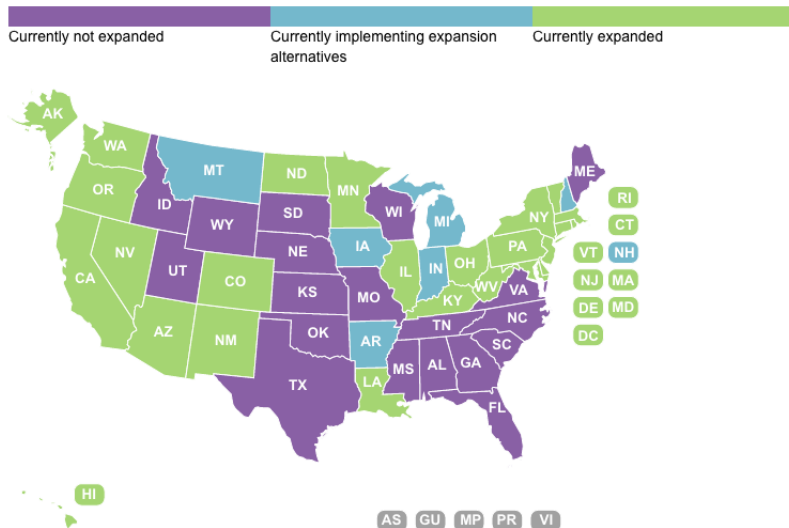
⁵ Military health care includes TRICARE and CHAMPVA (Civilian Health and Medical Program of the Department of Veterans Affairs), as well as care provided by the Department of Veterans Affairs and the military.

⁶ Individuals are considered to be uninsured if they do not have health insurance coverage for the entire calendar year.

Source: U.S. Census Bureau, Current Population Survey, 2014, 2015, and 2016 Annual Social and Economic Supplements.

Source: U.S. Census Bureau (2016), "Health Insurance Coverage in the United States: 2015," Current Population Reports, <https://www.census.gov/content/dam/Census/library/publications/2016/demo/p60-257.pdf>

State decisions on ACA-related Medicaid expansions



Source: NCSL, <http://www.ncsl.org/research/health/affordable-care-act-expansion.aspx>

Why employer-provided insurance?

Two main reasons:

- ① Risk pooling – create large insurance pools with a predictable distribution of medical risk
 - ▶ Helps insurance companies overcome the adverse selection problem
 - ▶ Economies of scale in dividing fixed administrative costs over many contracts, so that average provision costs are lower
- ② Tax incentives: health insurance is a non-taxable fringe benefit
 - ▶ If the labor income tax rate is τ , then an employer paying \$1 in additional wages results in after-tax income of $1 - \tau$
 - ▶ But employer spending \$1 more on health insurance provides a full \$1 of benefits to the employee
- Alternative is non-group direct insurance where AS problem limits coverage and generates high premia

Supply of health insurance

- Simple model of adverse selection in health insurance markets has...
 - ▶ Many customers with different health risks (i.e. different accident or illness probabilities)
 - ▶ Firms earning zero profits due to perfect competition (free entry/exit)
 - ▶ Fixed contracts: insurance companies offer one standardized contract
 - ▶ The type of coverage, deductible, doctor quality, care provider network, etc. are the same for each customer with a contract
- Demand curve is downward sloping (standard)
- What is the supply curve?
 - ▶ When there is no selection, companies set $p = MC = AC$, and the MC curve is the supply curve
 - ▶ But with selection $AC \neq MC$
 - ▶ Need to distinguish between adverse and advantageous selection cases

Supply of health insurance with selection

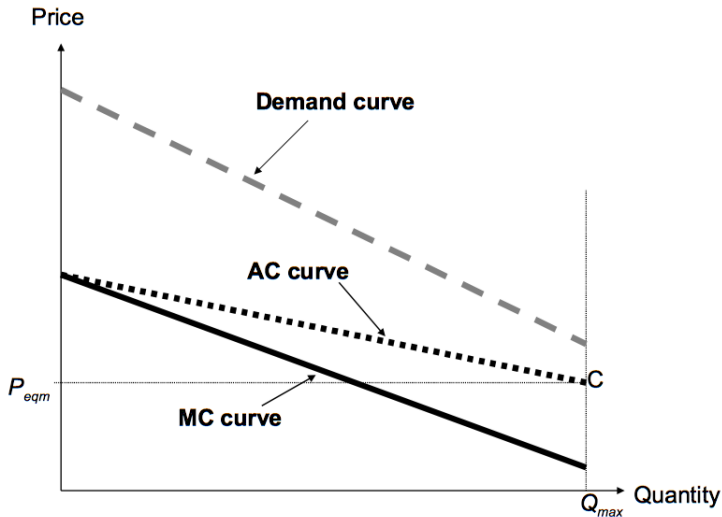
- Insurance provision with **adverse selection**

- ▶ Customers who are willing to buy at lower prices are lower risk
- ▶ The MC of serving new customers declines as the number of contracts Q increases ($AC > MC$)
- ▶ If a firm charges MC here, then it will not be able to cover average costs and will receive negative profits
- ▶ Supply curve is therefore the AC curve (*downward sloping!*)

- Insurance provision with **advantageous selection**

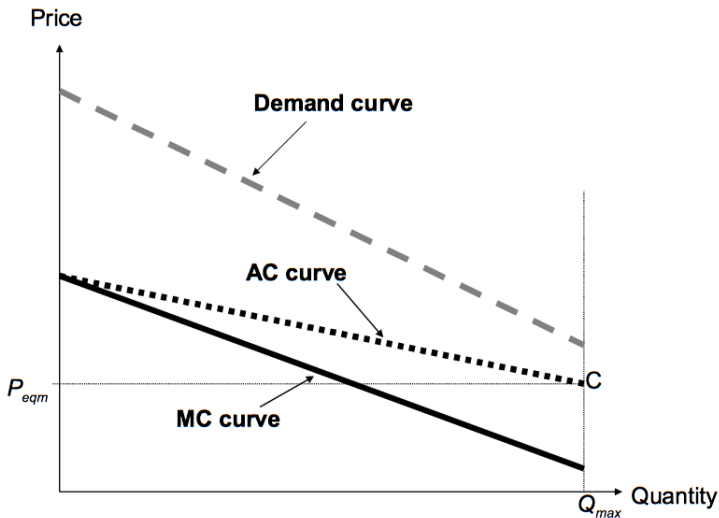
- ▶ Customers who are willing to buy at lower prices are higher risk
- ▶ The MC of serving new customers *increases* as $Q \uparrow$ ($AC < MC$)
- ▶ If a firm charges MC here, free entry would guarantee other firms rush in to earn positive profits, driving profits to zero $\implies p = AC$
- ▶ Supply curve is again the AC curve, but now **upward sloping!**

Adverse selection with fixed contracts



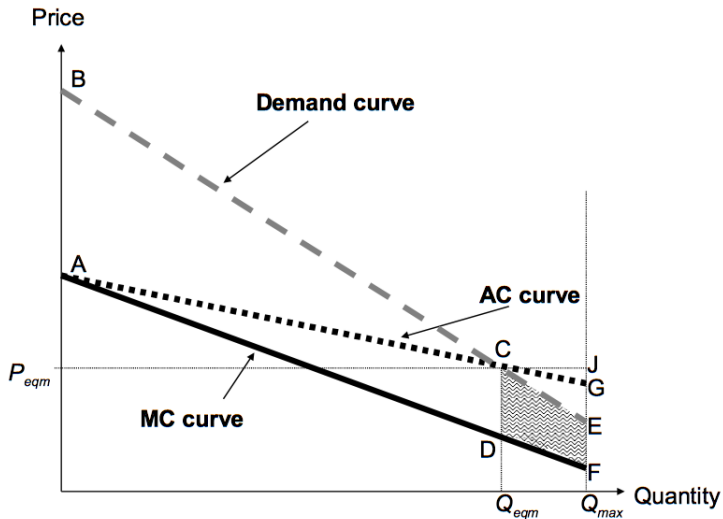
Source: Einav & Finkelstein (2011), "Selection in Insurance Markets: Theory and Empirics in Pictures," *Journal of Economic Perspectives*, <https://economics.mit.edu/files/5810>

Full provision in equilibrium



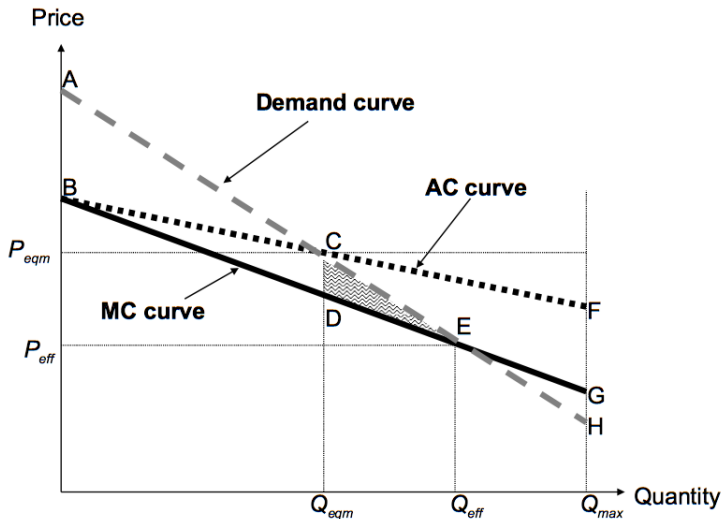
Source: Einav & Finkelstein (2011), "Selection in Insurance Markets: Theory and Empirics in Pictures," *Journal of Economic Perspectives*, <https://economics.mit.edu/files/5810>

Full provision efficient but partial provision in equilibrium



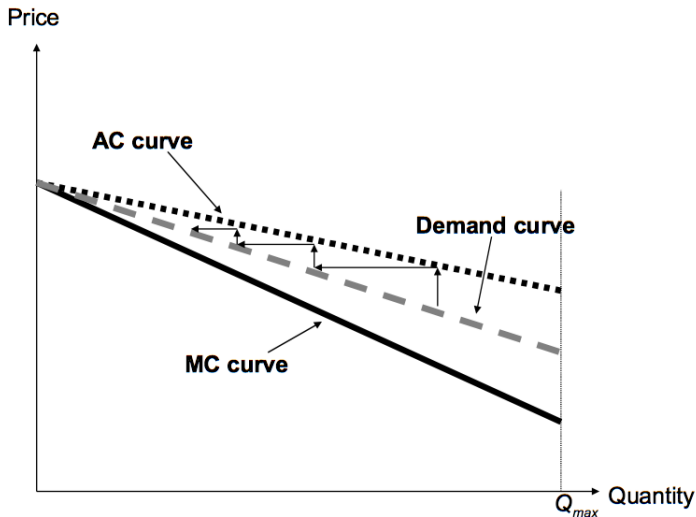
Source: Einav & Finkelstein (2011), "Selection in Insurance Markets: Theory and Empirics in Pictures," *Journal of Economic Perspectives*, <https://economics.mit.edu/files/5810>

Partial provision efficient (still have a DWL)



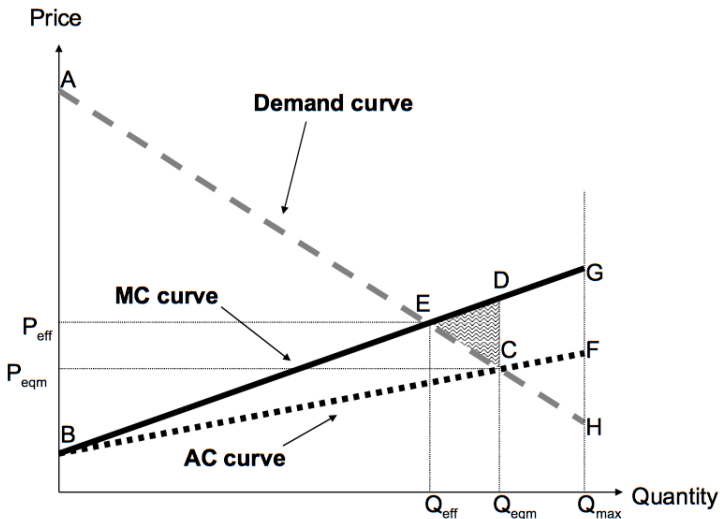
Source: Einav & Finkelstein (2011), "Selection in Insurance Markets: Theory and Empirics in Pictures," *Journal of Economic Perspectives*, <https://economics.mit.edu/files/5810>

Market unraveling – no insurance provided



Source: Einav & Finkelstein (2011), "Selection in Insurance Markets: Theory and Empirics in Pictures," *Journal of Economic Perspectives*, <https://economics.mit.edu/files/5810>

Advantageous selection



Source: Einav & Finkelstein (2011), "Selection in Insurance Markets: Theory and Empirics in Pictures," *Journal of Economic Perspectives*, <https://economics.mit.edu/files/5810>

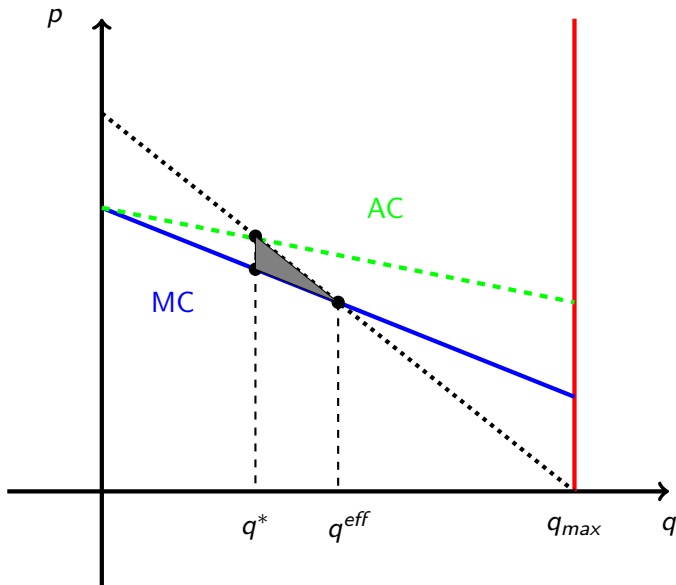
Sample problem – adverse selection in health insurance

- An insurance company offers a standardized health insurance contract with $q_{max} = 100$ potential customers
- Demand curve is given by $q = 100 - p$
- Customers differ with respect to their health risk
- The cost to the insurance company depends on the number of people q who buy insurance
- The company faces a total cost curve of $TC = 80q - q^2/5$
- Since the MC curve is $MC = \partial TC / \partial q = 80 - 2q/5$ and $\partial MC / \partial q = -2/5 < 0$ there is adverse selection here
- Note that $AC > MC$ for any q because $AC = TC/q = 80 - q/5 > MC = 80 - 2q/5$

Sample problem continued

- What is the number of contracts sold in equilibrium?
 - ▶ The supply curve here is the AC curve, so in equilibrium $100 - q = 80 - 2q/5 \implies q^* = 25, p^* = 75$
 - ▶ In market equilibrium we do not have full provision!
- What is the efficient number of contracts?
 - ▶ Market efficiency requires demand = MC, or $100 - q = 80 - 2q/5 \implies q^{eff} = 100/3 > q^*$ (underprovision)
 - ▶ If the government were to step in and provide coverage to everyone ($q^{gov} = 100$) this would be inefficient!
 - ▶ Full provision means choosing the point on the demand curve where $p = 0 < MC \implies$ the marginal cost exceeds the marginal benefit

Sample problem – graphical depiction



Medicare

- Federal program started in 1965 that provides (nearly) universal health insurance at subsidized price to those over 65 or with disability
- Anyone who has worked over 10 years (or their spouse) is eligible
- Financed through an uncapped payroll tax of 2.9% (split evenly between employer and employee)
- Decomposed into 4 schedules that cover different expenses
 - ▶ Part A: inpatient hospital costs, some long-term care
 - ▶ Part B: physician expenditures, outpatient hospital procedures
 - ▶ Part C: not a separate benefit – allows private health insurance companies to provide Part A and B benefits (HMO and PPO plans)
 - ▶ Part D: self-administered prescription drugs
- Physician reimbursement is fairly generous but not as high as with private insurance

Medicaid

- Provides health care to the poor (means-tested): eligible if income below 133% of poverty line (\approx \$32,350 for family of four in 2016)
- Federal government mandates minimum requirements and states administer the program separately
 - ▶ States have the ability to expand coverage beyond Federal guidelines
 - ▶ ACA initially tried to mandate expansions, 2012 SCOTUS ruling made it optional for states to adopt these expansions (many have anyways)
- Financed from general tax revenues (no separate payroll tax)
- Covers most health services at low cost to eligibles
- \approx 70% of recipients are women with children but 66% of expenditures goes towards long-term elderly care
- Physician reimbursement relatively low \implies many doctors refuse Medicaid patients (moral hazard on provider side)

Evidence on the effectiveness of Medicare

- Regression discontinuity design using the age 65 cutoff for Medicare eligibility (potential problems with this RD?)
- Card, Dobkin, & Maestas (2008,2009): compare short-term changes in health care utilization and mortality as people turn 65
 - ▶ Medicare causes sharp increase in coverage, especially among low-income individuals
 - ▶ Increase in health care utilization driven by discretionary medical care, diagnostic heart treatments
 - ▶ 1% drop in 7-day mortality for patients at age 65 \implies 20% reduction in deaths for severely ill patients
 - ▶ Mortality gap persists for nine months after initial hospital admission

Effect of Medicare on coverage

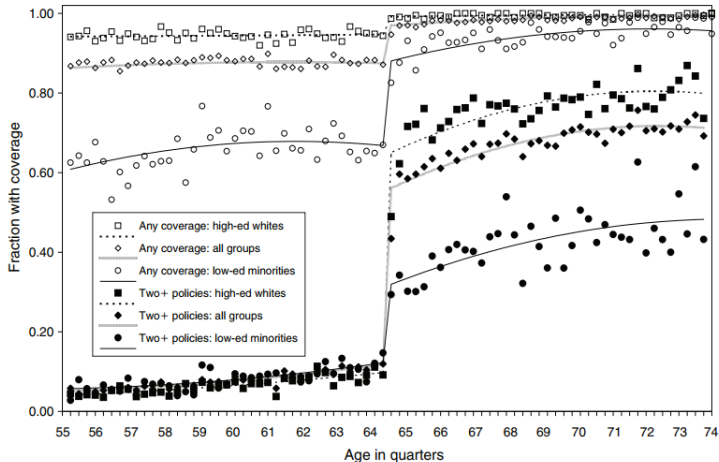


FIGURE 1. COVERAGE BY ANY INSURANCE AND BY TWO OR MORE POLICIES, BY AGE AND DEMOGRAPHIC GROUP

Source: Card, Dobkin, & Maestas (2008), "The Impact of Nearly Universal Insurance Coverage on Health Care Utilization: Evidence from Medicare," *American Economic Review*

Effect of Medicare on utilization

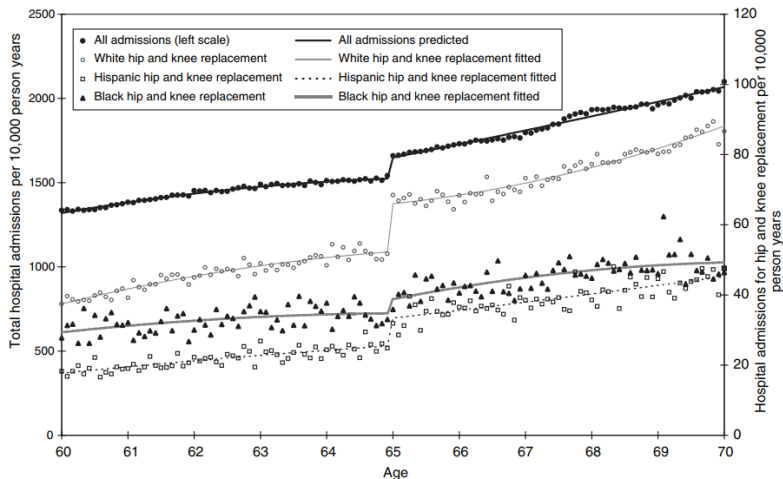


FIGURE 3. HOSPITAL ADMISSION RATES BY RACE/ETHNICITY

Source: Card, Dobkin, & Maestas (2008), "The Impact of Nearly Universal Insurance Coverage on Health Care Utilization: Evidence from Medicare," *American Economic Review*

Does Medicare save lives?

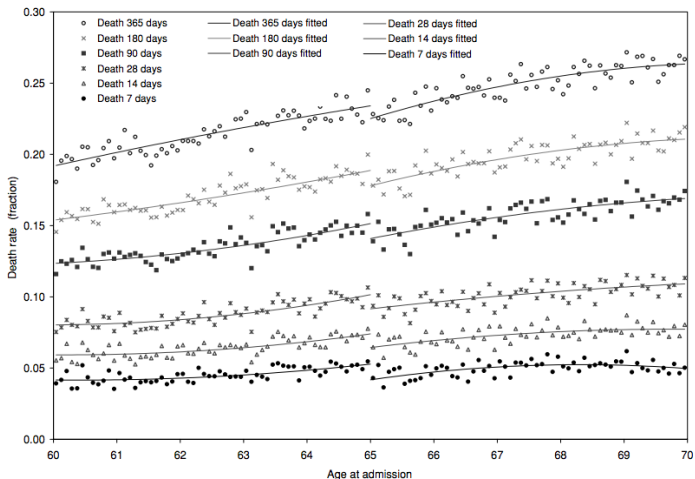


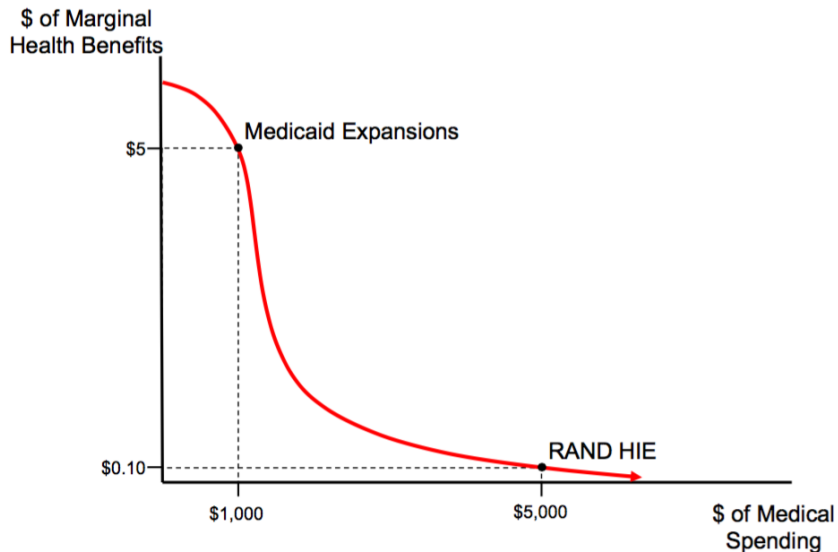
FIGURE VI
Patient Mortality Rates over Different Follow-Up Intervals

Source: Card, Dobkin, & Maestas (2009), "Does Medicare Save Lives?" *Quarterly Journal of Economics*

Evidence on the effectiveness of Medicaid

- Series of studies by Currie & Gruber (1996) uses DD methods with state Medicaid expansions to specific groups
- Medicaid expansions in 1984-1992 doubled the number of children eligible for insurance coverage
- Separate eligibility expansions over 1979-1992 for pregnant women
- Currie & Gruber (1996a): “Health Insurance Eligibility, Utilization of Medical Care, and Child Health”
 - ▶ 50% less likely to not see a physician in the past 12 months
 - ▶ Large increase in hospital visits
- Currie & Gruber (1996b): “Saving Babies: The Efficacy and Cost of Recent Changes in the Medicaid Eligibility of Pregnant Women”
 - ▶ For every 10% increase in eligibility, 0.43% decrease in low birth weight infants and 0.3% decrease in infant mortality

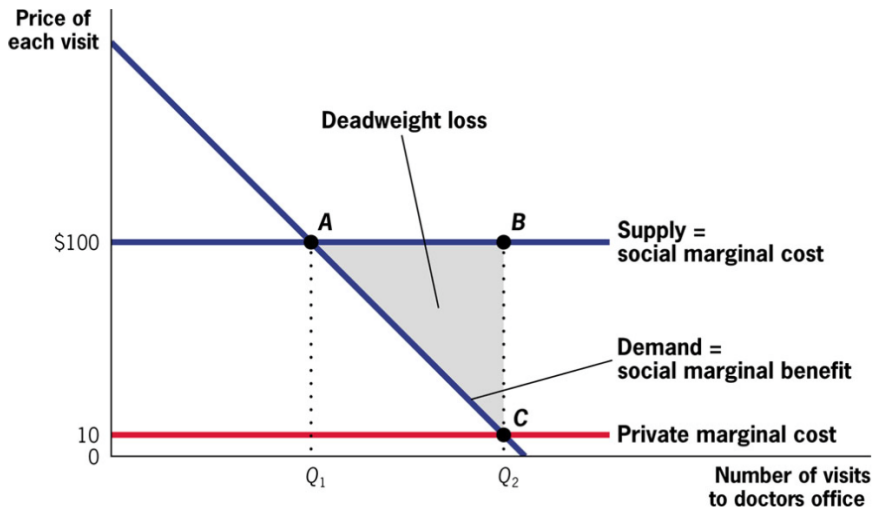
Health effectiveness curve



Health insurance and moral hazard

- Government provision has an advantage in dealing with adverse selection but not with moral hazard problems
- Moral hazard can occur on both the patient and provider side of public health insurance
- Patient moral hazard: insurance reduces the cost of using medical services \implies medical care may be used when it is not very effective at improving health outcomes
- Physician moral hazard: hospital staff have some discretion over which treatments/procedures are prescribed and which patients to accept
 - ▶ Type of reimbursement scheme for Medicare/Medicaid affects physician decisions in caring for patients if hospitals put weight on profits

Patient moral hazard



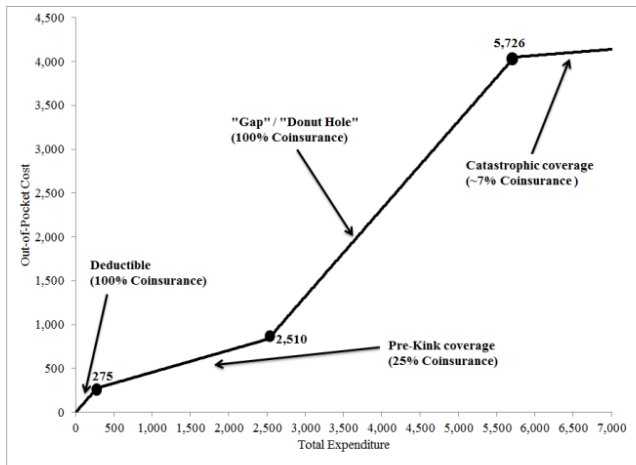
Source: Gruber, *Public Finance and Public Policy*, Figure 15.6

Empirical application: Medicare Part D

- Medicare Part D for prescription drug coverage has an odd feature that is slowly being phased out by the ACA
 - ▶ Below a certain low threshold of expenditures, you pay the full cost (deductible), then receive a 75% subsidy
 - ▶ But then once you spend enough, the 75% subsidy reverts to a 0% subsidy ([donut hole](#))
 - ▶ Donut hole will be completely eliminated by 2020
- Einav, Finkelstein, & Schripf (2013) show that individuals bunch at the kink where the 75% subsidy stops
 - ▶ This is evidence of moral hazard in drug consumption (why?)
 - ▶ Interestingly, the bunching pattern is similar over time even though the exact location of the kink changes each year
 - ▶ Suggests that Medicare recipients understand their insurance coverage quite well in spite of the complexity

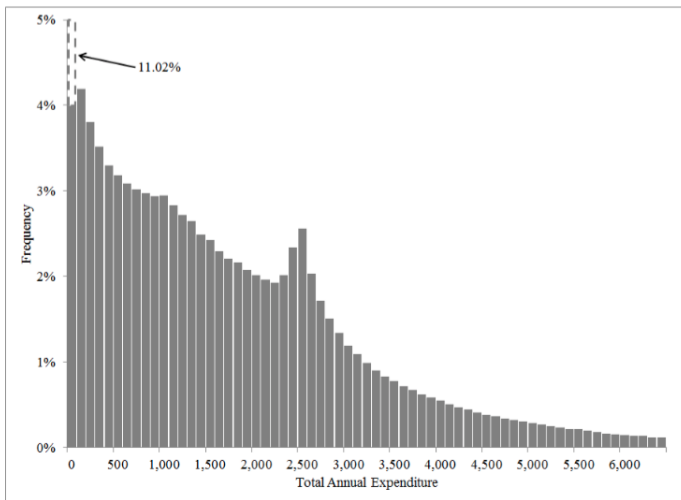
Medicare Part D donut hole

Figure 1: Medicare Part D standard benefit design (in 2008)



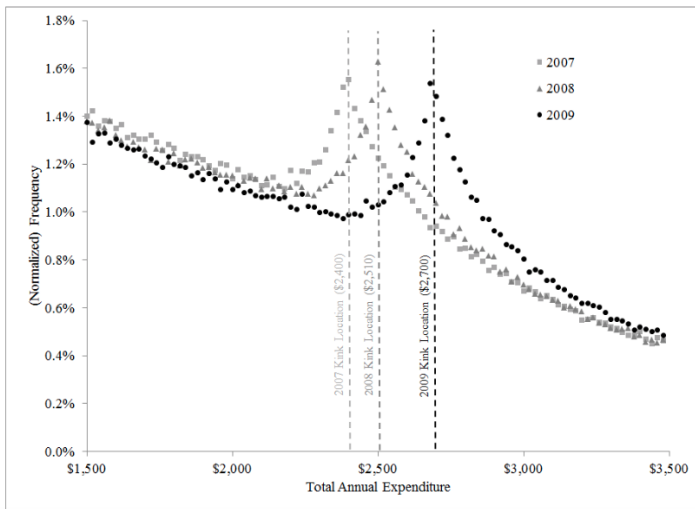
Source: Einav, Finkelstein, & Schrimpf (2013), "The Response of Drug Expenditures to Non-linear Contract Design: Evidence from Medicare Part D," *NBER Working Paper* No. 19393

Annual prescription drug spending, 2008



Source: Einav, Finkelstein, & Schrimpf (2013), "The Response of Drug Expenditures to Non-linear Contract Design: Evidence from Medicare Part D," *NBER Working Paper* No. 19393

Bunching around the donut hole kink



Source: Einav, Finkelstein, & Schrimpf (2013), "The Response of Drug Expenditures to Non-linear Contract Design: Evidence from Medicare Part D," *NBER Working Paper* No. 19393

How are insurance claims paid?

- Payment for physician services for a patient takes the form
$$P = \alpha + \beta \cdot c$$
- α = payment for fixed cost of practicing
- β = payment for variable costs c – i.e. ordering tests, employing hospital staff to administer treatments
- Two main methods of payment (α, β) :
 - ① Fee-for-service ($\alpha = 0, \beta > 1$): no fixed payment, but insurance company pays cost of all services plus a surcharge
 - ② Capitation ($\alpha > 0, \beta = 0$): fixed payment that varies by provider type and number of patients

Physician moral hazard

- Trend towards lower β – Medicare moved from retrospective reimbursement to partial capitation (prospective payments) in 1983
- Lower β provides incentives for doctors to provide less services \implies they may provide too little care
- Tradeoff: lower costs but potentially lower quality of patient care
- Medicare reimburses hospitals using nationally standardized payments for diagnoses grouped into Diagnosis Related Groups
- Even though the reimbursement α is fixed for each DRG, hospitals still have discretion in assigning DRGs
 - ▶ Patient presenting with heart trouble might be assigned the “pacemaker implantation” or “coronary bypass” DRG – these have different fees!

Summary

- Coexistence of U.S. private and public health insurance coverage generates adverse selection and moral hazard problems
- Adverse selection in private markets pushes up premia and increases the number of uninsured
- Programs like Medicare/Medicaid seek to cover the uninsured and reduce inequality in health outcomes
- Goals of ACA were to reduce non cost-effective health spending, increase the efficiency of the system, and cover the uninsured
 - ▶ Too much spent on unnecessary procedures for the insured (patient moral hazard) – low part of the health effectiveness curve