

Version A

1.(a) Welfare loss = $0.5 \times 0 + 0.25 \times \text{triangle ABC} + 0.25 \times \text{triangle DEF}$
 $= 0.25 \times (0.5 \times 100 \times 10) + 0.25 \times (0.5 \times 100 \times 10) = 0.25 \times 500 + 0.25 \times 500 = \$250.$

(b) Elasticity = $\frac{(777 - 583) / [(777 + 583)/2]}{-(0 - 50) / [(0+50)/2]} = \frac{194/680}{50/25} = \frac{0.285}{2} = 0.14.$

(c) Yes. Health care demand is sufficiently price responsive that moral hazard is a real problem. Furthermore they calculate this moral hazard – it is large relative to total health spending.

2.(a) First test correctly finds 800 cases (80% of the 1,000 with cancer) and incorrectly finds 10,000 cases (10% of the 100,000 tested).

Cost: $100,000 \times \$5 + (800 + 10,000) \times \$100 = \$1,580,000.$

Benefit: $800 \times \$10,000 = \$8,000,000.$

Yes. Test is worthwhile as (marginal) benefit of first test > (marginal) cost of first test.

(b)(i) Cost benefit-analysis compares the marginal cost of a medical intervention with the marginal benefit. If MB exceeds MC then the intervention is worthwhile.

Cost-effectiveness analysis calculates the marginal cost of a given outcome e.g. QALY.

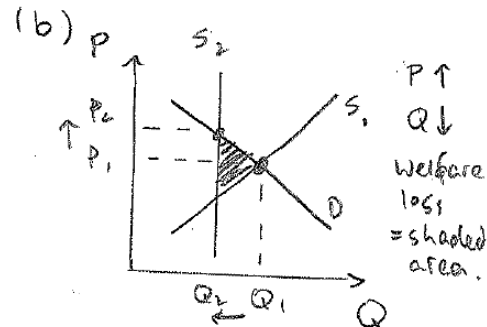
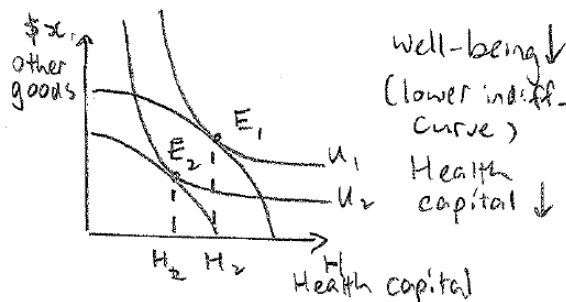
(ii) Cost-effectiveness analysis is more commonly used as it does not need to place a dollar value on the outcome, such as value of a life-year saved.

(c) $T = [0.50 - 0.45] / \text{sqrt}(0.02^2 + 0.02^2) = 0.05 / 0.0283 = 1.77.$

Since $|T| < z_{0.05} = 1.96$ do not reject $H_0: \mu_1 = \mu_2$ in favor of $H_A: \mu_1 \neq \mu_2.$

The difference is not statistically significant at significance level 5%.

3. (a)



(c)(i) Payment per member per month.

(ii) Prospective payment per diagnosis related group.

4.(a) False. It is around 15%.

(b) False. A one-time drop, but now back at similar growth rate.

(c) True.

(d) True.

(e) False. Upper bound estimates are 10% of health care spending, so less than \$300 billion.

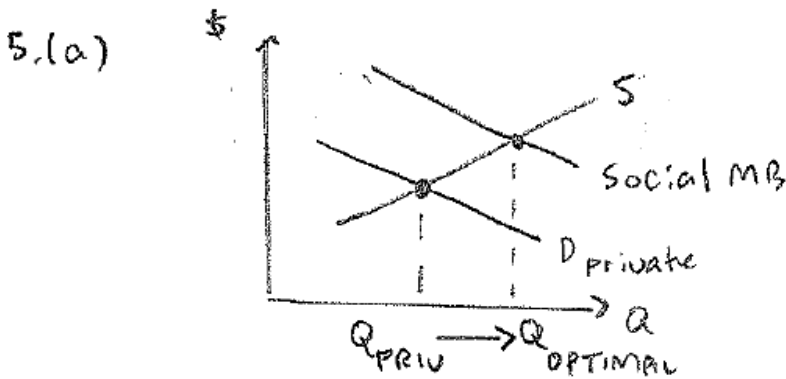
(f) False. It is assumed that death rates will remain the same as in 2009.

5.(b) Social marginal benefit = $100 \text{ million} \times (1 - 0.02 \times Q) = (100 - 2Q) \text{ million}.$

Set $SMB = SMC \implies (100 - 2Q) \text{ million} = 10 \text{ million} \implies Q = 45.$ Conduct 45 tests.

(c)(i) Medicare provides all health care but nursing home care to over 65's.

(ii) Medicaid provides health care not provided by Medicare to over 65's who are very poor.



6.(a) That obesity greatly increases use of health care services and chronic conditions and its effect is comparable to that of aging 20 years.

(b) We have $BBMI = \text{other factors} + 0.631 \text{ restaurants} - 0.011 \text{ restaurants}^2$

So $dBMI/d\text{restaurants} = 0.631 - 0.022 \text{ restaurants} = 0.631 - 0.022 \times 13.252 = 0.345$.

An additional restaurant per 10,000 people increases average BMI by 0.351.

OR elasticity $(dy/y)/(dx/x) = 0.345 \times 13 / 26 = 0.173$.

A 1% increase in restaurants increases average BMI by 0.173%. This is a large effect.

(c) For heart attack the year gained is not far out e.g. five years out.

For low-birthweight the 12 years gained are a long way out e.g. seventy years out.

When we discount these years back to the present (at 3%) they are worth much less.

7.(a)(i) U.S. insurance is not universal and (compared to most) has greater private sector role.

(ii) U.S. life expectancy is lower and infant mortality is higher. So outcomes not as good.

(b)(i) U.S. has much greater role for insurance in health care than in China and India.

(ii) U.S. life expectancy is higher and infant mortality is lower – but not as much as one might expect.

(c) Many possibilities here: increased proportion with health insurance; Medicare going broke; states with not enough money for Medicaid; paying for new technology; increased use of cost-effectiveness analysis to determine what treatments are covered by insurance ...

Multiple choice

Ques: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

Ans: c b b c b b c c b b d b b b d c a a

Explanations: 3. $6000 \pm 2 \times 4000/\sqrt{100} = 6000 \pm 2 \times 4000/10 = 6000 \pm 800$.

15. Restaurants up over time; obesity up over time. Need not be causal effect.

Scores out of 60

Curve (Indication only: Course Grade is based on Total Score!)

Average GPA on this curve 2.71

75 th percentile	46 (77 %)	A+	53 and above	C+	38 and above
Median	41 (68 %)	A	48 and above	C	36 and above
25 th percentile	36 (60 %)	A-	46 and above	C-	34 and above
		B+	44 and above	D+	32 and above
		B	42 and above	D	30 and above
		B-	40 and above	D-	28 and above