

Version A

1.(a) $MB = (\text{number of cases detected}) \times (\text{\$benefit per case detected})$
 $= (0.05 \times 10,000) \times (0.2 \text{ years} \times \$100,000 \text{ per year}) = 500 \times \$20,000 = \underline{\$10,000,000}.$

$MC = (\text{number of cases detected}) \times \text{\$cost per case detected}$
 $= (0.05 \times 10,000) \times \$10,000 = 500 \times \$10,000 = \underline{\$5,000,0000}.$

Yes. Screening is beneficial as MB exceeds MC.

(b) The cost was \$5,000,0000 and 500 cases were detected.

The cost of screening per life-year saved

$= (\text{cost of screening}) / (\text{number of life-years saved})$

$= \$5,000,0000 / (0.05 \times 10,000 \times 0.2) = \$5,000,0000 / 100 = \underline{\$50,000}.$

(c) Direct cost of screening the 10,000 = (# initial tests x \$25) + (# confirmatory tests x \$20)

Method A: The way done in class (false positive rate applied to all tested)

$= (10,000 \times \$25) + (90\% \text{ of those with diabetes} + 10\% \text{ of all those tested}) \times \20

$= (\$250,000) + (0.9 \times 500 + 0.1 \times 10000) \times \$20 = \$250,000 + (450 + 1000) \times \$20 = \underline{\$279,000}.$

Method B: Perhaps more obvious (false positive rate applied to only those without diabetes)

$= (10,000 \times \$25) + (90\% \text{ of those with diabetes} + 10\% \text{ of those without diabetes}) \times \20

$= (\$250,000) + (0.9 \times 500 + 0.1 \times 9500) \times \$20 = \$250,000 + (450 + 950) \times \$20 = \underline{\$278,000}.$

2.(a)(i) D is optimum in absence of moral hazard.

(ii) H is optimum in presence of moral hazard.

(b) Only those with loss in excess of \$6,000 will buy insurance.

The expected loss of those insured will be \$7,500 (= the mean of uniform on 6,000 to 9,000).

The insurance company will make a loss (of \$1,500 + \$1,000 administration costs).

(c)(i) Adverse selection arises if high risk individuals are disproportionately likely to buy health insurance. OR Adverse selection in an insurance market arises if different individuals have different expected losses and are able to reasonably estimate these expected losses, but insurance companies do not have this information.

(ii) An insurance death spiral occurs when insurance premia rise, so more healthy people leave, so average claims increase, so insurance premia rise even more, so even more healthy leave, ...

3.(a) True This is an important policy result from economic theory.

(b) False Optimal was 2-3 tests.

(c) True It uses MB in place of demand and MC in place of supply

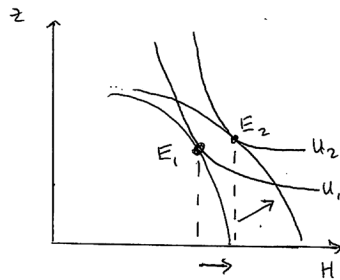
(d) True It is around \$10 million.

(e) False Gatekeeper is to reduce moral hazard / overconsumption. .

(f) False Differences-in-differences is one quasi-experimental method used for causal analysis.

Version A (Continued)

- 4.(a)(i) This is movement out in the health possibilities curve.
 (ii) Consumer equilibrium moves from E1 to E2 and health capital has increased, as drawn.



(b) We have

Number of teams	Lives saved	Marginal lives saved	Marginal cost	MC per life saved
1	200	200	500,000	2,500
2	300	100	500,000	5,000
3	350	50	500,000	10,000
4	375	25	500,000	20,000
5	385	10	500,000	50,000
6	390	5	500,000	100,000

So choose 4 teams as with 4 teams $20,000 < 25,000$ but with 4 teams $50,000 > 25,000$.

(c)(i) QALY is a quality-adjusted life year, where quality of life is rated on a scale between 0.0 (death) and 1.0 (good health).

(ii) Cost-benefit analysis requires placing a dollar value on an outcome such as a life-year saved. Cost-effectiveness analysis avoids this by computing cost per outcome such as a life-year saved.

5.(i) Plan 2, the omitted category has highest. (Plan 1 is -530.43 lower; plan3 is -780.69 lower).

(ii) Yes. The F-test has $p=0.005 < 0.05$.

(iii) The average difference is $-530.4282 - (-780.6911) = \250.26 .

(iv) $\text{gen lspend} = \ln(\text{spending})$ and $\text{gen lnincome} = \ln(\text{income})$ and regress lspend $\ln\text{income}$

(v)-(vi) Either $(0.32 - (-0.07)) - (-0.54 - (-0.44)) = 0.39 + 0.10 = 0.49$

Or $(0.32 - (-0.54)) - (-0.07 - (-0.44)) = 0.86 - 0.37 = 0.49$.

Multiple choice

Question	1	2	3	4	5	6
Answer	a	d	b	c	c	a

Scores out of 36

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

75 th percentile	31 (86 %)	(Ave GPA 2.76 on this curve)	C+	24.5 and above
Median	28 (78 %)	A	32.5 and above	C
25 th percentile	25 (69 %)	A-	31 and above	C-
		B+	29.5 and above	D+
		B	27.5 and above	D
		B-	26 and above	D-