Econ 132 Winter 2018   SECOND MIDTERM EXAM (A): SOLUTIONS   Cameron

<u>Version A</u>

1.(a) MB = (number of cases detected) x ($benefit per case detected)
        = (0.05 x 10,000) x (0.2 years x $100,000 per year) = 500 x $20,000 = <u>$10,000,000</u>.
MC = (number of cases detected) x $cost per case detected
    = (0.05 x 10,000) x $10,000 = 500 x $10,000 = <u>$5,000,0000</u>.
<u>Yes</u>. 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
= (cost of screening) / (number of life-years saved)
= $5,000,0000 / (0.05 x 10,000 x 0.2) = $5,000,0000 / 100 = <u>$50,000</u>.

(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 x $25) + (90% of those with diabetes + 10% of all those tested) x $20
= ($250,000) + (0.9 x 500 + 0.1 x 10000) x $20 = $250,000 + (450 + 1000) x $20 = <u>$279,000</u>.
Method B: Perhaps more obvious (false positive rate applied to only those without diabetes)
 = (10,000 x $25) + (90% of those with diabetes + 10% of those without diabetes) x $20
= ($250,000) + (0.9 x 500 + 0.1 x 9500) x $20 = $250,000 + (450 + 950) x $20 = <u>$278,000</u>.

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.
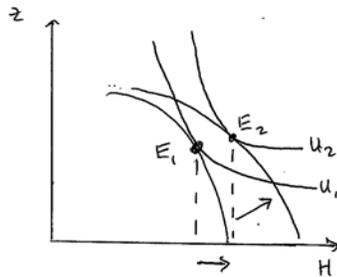**(e)** False   Gatekeeper is to reduce moral hazard / overconsumption. .
(f) False   Differences-in-differences is one method used for causal analysis.

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	500	500	100,000	200
2	600	100	100,000	1,000
3	610	10	100,000	10,000
4	612	2	100,000	50,000
5	613	1	100,000	100,000
6	613	0	100,000	∞

So choose 3 teams as with 3 teams $10,000 < 20,000$ but with 4 teams $50,000 > 20,000$.

(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) gen lspend=ln(spending) and **gen lnincome = ln(income)** and **regress lnspend lnincome**

(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!)

75th percentile	31 (86 %)	(Ave GPA 2.65 on this curve)		C+	25.5 and above
Median	28 (78 %)		A	C	24.5 and above
25th percentile	25 (69 %)		A-	C-	23 and above
		32.5 and above			
		31 and above			
		B+	29.5 and above	D+	21.5 and above
		B	28.5 and above	D	20.5 and above
		B-	27 and above	D-	19 and above