Exercise 1: Costing of health services

Estimated time to work (10 min)

You have the following information from a trial for settings up an outpatient service for administration a chemotherapy drug for ***patient*** *with colon cancer* ***per year***

Resource use per year	***Frequency per year***	***Unit cost for one unit (Chemotherapy A)***	***Unit cost for one unit (Chemotherapy B)***
Drug regimen per patient	*12*	*12*	*25*
Disposable equipment (infusion) (JDs)per patient	*36*	*10*	*10*
side effect treatment	*25% for A, 30%, for B*	*40*	*30*
Other resource uses			
Monthly salary (capacity 200 patients per year)	*12*	*300*	*300*
Time of nurse needed to administrate chemotherapy (min) min		*25*	*15*
Overtime salary (JDs/hr)	12 → only for marginal	*20*	*20*
Laptop	*1*	*300*	*300*
Chemotherapy unit overheads (lighting, heating) (JDs/ month)	*12*	*30*	*30*

Calculate the following cost for setting up the service for chemotherapy A and B during the first year

A. Which costs are variable cost?

drug regimen / disposables / side effect of treatment

B. Which costs are overhead fixed?

lighting, heating

C. Which costs are fixed capital/overhead costs?

Laptop

D. Which costs are semi fixed?

Staff salaries (fixed salary 300 JDs)
(variable salary = overtime)

E. Variable costs associated with treating 200 patients per year ?

(A) frequency * unit cost * pt. number
$[(12\times12)+(36\times10)+(40\times\frac{1}{4})]\times200 = (144+360+10)(200) = 514\times200 =$ 102800 JDs per year

(B) $[(12\times25)+(36\times10)+(30\%\times30)]\times200$
$= (300+360+9)\times200$
$= 669\times200 =$ 133800 JDs per year

F. Fixed cost associated for setting up the service (assuming the capacity) per year?

Monthly salary + laptop + overheads

(A) $(300\times12)+(1\times300)+(12\times30)$
$= 3600+300+360 =$ 4260 JDs

(B) $(12\times300)+(1\times300)+(12\times30)$
$3600+300+360 =$ 4260 JDs

G. Total costs associated with setting up the service (assuming the capacity) per year ?

(A) variable + fixed
102800 + 4260 = 107060 JDs

(B) variable + fixed
13380 + 4260 = 138060 JDs

H. Average costs per patient for setting up the service over the first year?

Average cost per patient = total / # of pts

(A) $\frac{107060}{200} =$ 535.3 JDs

(B) $\frac{138060}{200} =$ 690.3 JDs

(B) (25×12) + (36×10) + (30% ×30)
300 + 360 + 9 = 669 JDs × 30 = 20070 JDs

(+) 15min × 30 = 450 min
7.5 hr × 12 month
= 90 hr/year
1hr = 20 → 90hr = 1800

→ 20070 + 1800 = 21870 JDs
÷30 = 729 JDs

variable + extras

I. The average marginal cost for treating new 30 patients?

(A) (12×12) + (36×10) + ($\frac{1}{4}$ ×40) = 144 + 260 + 10 = 514 JDs ×30 = 15420 JDs (variable)

(+) 25 min ×30 = 750 min
12.5 hr ×12 months
= 150 hr per year

1 hr → 20 JD
150 hr → ?
= 3000 JD per year

15420 + 3000
= 18420
÷30 = 614 JDs

Exercise 2 what type of cost ?

- *If a new clinic required a part-time pharmacist and a currently employed pharmacist was asked to fill in at the clinic as part of his or her duties (instead of hiring a new part-time pharmacist for the clinic). The hourly rate of the pharmacist multiplied by the number of hours spent at the clinic would be ----------fixed----------*

- *For chemotherapy treatment, costs of the chemotherapy products themselves, other medications given to reduce side effects of the chemotherapy, intravenous supplies, laboratory tests, clinic costs, and physician visits are* variable → direct medical

- *Benefits or costs result from a reduction in pain and suffering related to a product or intervention is* intangible

- *The costs that is related to patient, care govern loss of productivity or because of premature mortality is* indirect

I

Exercise 3

Assuming the percentages of patients who remained alive LYG following the administration of chemotherapy A and B were 60%, 70% year, respectively over the first year. Please calculate the followings for the capacity (200 patients)

Avg LYG A → 0.6
B → 0.7

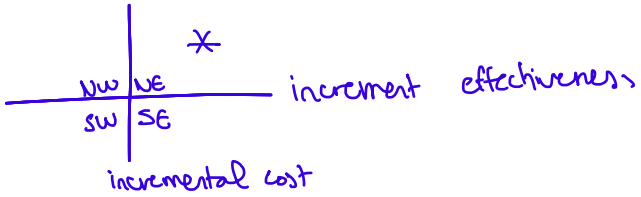
Avg cost from Qs above: (A) 535.3 JDs
(B) 690.3 JDs

Is Chemotherapy B cost-effective compared with A ?

incremental : $\frac{B - A \text{ cost}}{B - A \text{ LYG}} = \frac{690.3 - 535.3}{0.7 - 0.6} = \frac{155}{0.1} =$ 1550 JDs / Aug LYG

Per Patient Per 1 LYG

Draw the cost-effectiveness plan



Decide which quadrant the incremental CE point is in?

NE

Do we need a cost-effectiveness threshold?

Yes

Exercise 5 CUA analysis

quality + quantity

If the average utility associated with administering chemotherapy A and B were 0.8, 0.5 respectively? Using CUA analysis?

A B

Calculate the average QALY for each intervention? → QALY = LYG x utility

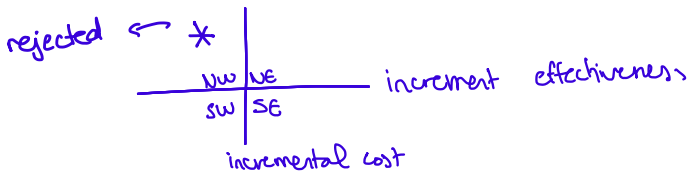
(A) $0.6 \times 0.8 = 0.48$

(B) $0.7 \times 0.5 = 0.35$ → less effective

incremental = $\frac{B-A \text{ cost}}{B-A \text{ QALY}} = \frac{690.3 - 535.3}{0.35 - 0.48}$

$= \frac{155}{-0.13} = -1192.3$

Draw the cost-effectiveness plan



Decide which quadrant the incremental CE point is in?

NW

Do we need a cost-effectiveness threshold?

No , already rejected

Perspective workshop:

Case1:

Patient A (have an insurance in the MOH and he cover 20% of his insurance) has been transferred from MOH to JUH to get a medical treatment. The actual costs of the medical service provided by the JUH were 100 JD.

1 What the cost considered from the payer perspective?

2 What the cost considered from the provider perspective?

Ans: 1. Payer → MOH → 80% → 80 JDs Patient → 20% → 20 JDs

2. Provider → als → 100 JDs

Case 2:

Which of these costs will be considered from payer and provider perspective (e.g. MOH)?

✓ •Prescriber time → semi-fixed

X •Time in hospital → indirect cost

✓ •Drug costs → direct medical (variable

X •Time off work (For patients) → indirect

✓ •Time off work (For MOH's employee) → indirect

X •Out of pocket transport expenses → direct non medical

✓ •Time to dispense the medicines → semi-fixed

Case 3:

The costs of Drug A, on average

- Drug costs =10,000 JDs over 10 years
- Prevent 5 doctor visits / over 10 years = 500 JDs
- Prevent 1 hospitalisation/ over 10 years = 2000 JDs
- Saves 10 working days for patients/ over 10 years = 2000 JDs

What would be the cost from:

- Payer perspective (e.g. health insurance company)? 10000 − (500 + 2000) = 7500
- Societal perspective ?

Economic evaluation workshop

Case1:

Let us once again consider which medicines should be used to treat hypertension.
Drug A causes a 10mmHg drop in blood pressure and costs 120 JDs per year
OR
Drug B causes a 15mmHg drop in blood pressure but costs 180 JDs per year.
Can we use cost minimisation?

No, different clinical outcome

Case 2: LYG

¢If a treatment increases one's life expectancy by 2 years, but causes adverse effects or inconvenience, such that one's utility are decreased by 25%, the net gain or QALY gained will be

was 1 → now 0.75

QALY = LYG × utility = 2 × 0.75 = 1.5

Case3:
Suppose decision maker had to choose between two proposals for implementation. Also assume that the projects are for 1 year
¢Proposal A: Cost=$1000; Benefit=$2000
¢Proposal B: Cost=$5000; Benefit=$7500

Calculate Net benefit for A and B?
Calculate Net cost for A and B?
Differences in net benefit of B as compared to A?