Health economics and policies - Mid 020 & 019

1) True about perspective:
   a. Cost must be measured from the perspective selected
   b. Cost and outcome can be measured from different perspectives
   c. outcome must be measured from the perspective selected

- Series (Question 2-5): Muna, a patient seeking to initiate dialysis, is in the process of scheduling her sessions. She receives a 30% insurance coverage from the Ministry of Health (MOH), and the monthly cost of dialysis at JUH is $55.

2) If Muna isn't an employee for MOH, the cost of days off is from which perspective?
   a. Patient
   b. Provider
   c. Payer
   d. Patient & Payer

3) What's the annual cost from the patient perspective?
   a. 462
   b. 660
   c. 198

7x55x12

4) What's the annual cost from payer perspective?
   a. 462
   b. 660
   c. 198

3x55x12

5) What's the annual cost from provider perspective?
   a. 462
   b. 660
   c. 198

1x55x12

6) Costs of the child nursery as a result of illness are considered _____ costs.
   a. direct capital costs
   b. indirect cost
   c. direct overhead costs

Q1

The question is asking: "Whose point of view are we looking at when counting the cost?"

There are 3 possible "people" who can pay for healthcare:

1. **Patient** → the person who is sick and pays from their own pocket
2. **Provider** → the hospital/clinic
3. **Payer** → the insurance or Ministry of Health (MOH)

In this question:

- Muna is starting dialysis.
- MOH covers **30%**.
- Muna pays the **rest**.
- She is **not** an MOH employee, so she pays normally like any other patient.

Since **she** is paying the remaining cost, the cost we are looking at is from **her point of view → patient perspective.**

Q6

Simple explanation:
Child nursery (childcare) expenses happen **because the patient is sick** and cannot take care of the child.
They are **not medical** (not drugs, tests, hospital).
They are **not indirect** (indirect = lost productivity/wages).
They are **direct, but non-medical** → money directly spent due to illness, but outside the healthcare system.

Money that you spend because you are sick, but it is NOT paid to a hospital, clinic, doctor, pharmacy, or lab.

Examples of **direct non-medical costs**:

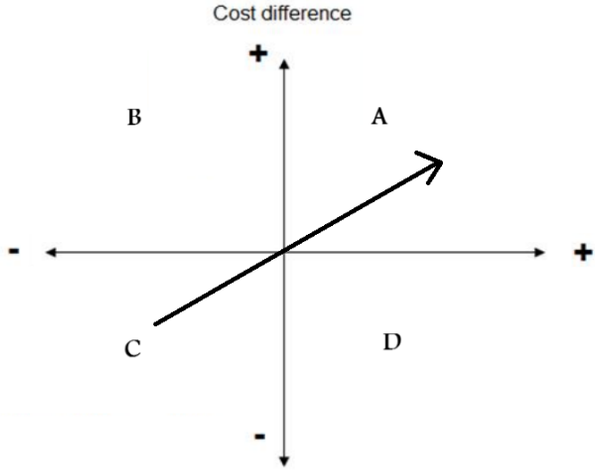
- Paying for **child nursery** because you're too sick to care for your child.
- Paying for **transportation** (taxi, bus) to go to the hospital.
- Paying for **special food** needed because of illness.
- Paying for **home modifications** (rails, ramps) after illness.

All of these are **directly caused by the illness**, but you are not paying a medical provider.

d. direct variable costs

e. direct non-medical

7) Which of the following is true?



a. A & B should be accepted easily

b. D should be accepted easily

The graph plots a new intervention against a standard or control.

- **Y-Axis (Vertical):** Represents **Cost Difference**.
  - **Top (+):** The new intervention is **more expensive**.
  - **Bottom (-):** The new intervention is **cheaper** (cost saving).
- **X-Axis (Horizontal):** Represents **Effectiveness Difference** (Health outcomes).
  - **Right (+):** The new intervention is **more effective**.
  - **Left (-):** The new intervention is **less effective**.

Analyzing the Quadrants

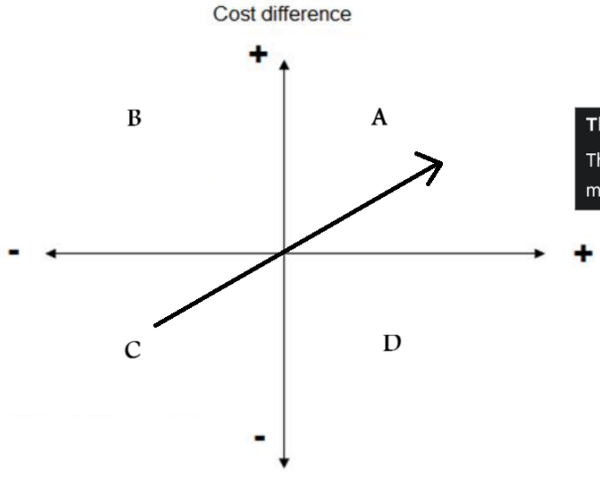
Each letter represents a different scenario for a new treatment:

- **Quadrant A (Top-Right): More Effective but More Expensive.**
  - *Decision:* This is a **Trade-off**. You have to decide if the extra health benefit is worth the extra money (usually calculated using an ICER threshold). You don't "accept easily"; you have to calculate if it's worth it.
- **Quadrant B (Top-Left): Less Effective and More Expensive.**
  - *Decision:* **Reject.** This is a "Dominated" strategy. It costs more money and gives worse health results. You would never accept this.
- **Quadrant C (Bottom-Left): Less Effective and Cheaper.**
  - *Decision:* **Trade-off.** You might accept this if you are willing to sacrifice some health effectiveness to save money, but it's not an automatic "yes."
- **Quadrant D (Bottom-Right): More Effective and Cheaper.**
  - *Decision:* **Accept.** This is the **Dominant** strategy. The new treatment works better *and* saves money. There is no downside, so it should be adopted immediately.

The question asks which statement is true.

- **Option a ("A & B should be accepted easily"):** This is **incorrect**. "B" is a bad option (more cost, less health) and should be rejected. "A" requires a difficult decision about value for money.
- **Option b ("D should be accepted easily"):** This is **correct**. In Quadrant D, you are getting better health outcomes for less cost. Because there are no negatives (no extra cost, no lost health), the decision is easy: you accept it.

8) ICER not needed?



a. A+C

b. B+A

c. D+B

The Core Concept: When do you need an ICER?

The **ICER** (Incremental Cost-Effectiveness Ratio) is a calculation used to determine "value for money." It tells you how much you are paying for each unit of health benefit gained.

1. **Quadrants A and C (The "Trade-off" Zones):**
   - **Quadrant A:** The new treatment is **more effective** but **more expensive**. You *need* the ICER to decide if the extra benefit is worth the extra cost.
   - **Quadrant C:** The new treatment is **cheaper** but **less effective**. You *need* the ICER to decide if the money saved is worth the health lost.
   - *Conclusion:* For A and C, an ICER is essential.
2. **Quadrants B and D (The "Dominance" Zones):**
   - **Quadrant D (Dominant):** The new treatment is **more effective** AND **cheaper**. You don't need a calculation to tell you what to do. You simply **accept** it because it's better in every way.
   - **Quadrant B (Dominated):** The new treatment is **less effective** AND **more expensive**. You don't need a calculation. You simply **reject** it because it's worse in every way.
   - *Conclusion:* For B and D, the decision is obvious (automatic acceptance or rejection). Therefore, an ICER calculation is **not needed** to make the decision.

9) During COVID outbreak, which of the following is considered a fixed cost?

a. PCR testing

b. Extension of buildings

c. Medical staff and nurses

- **Fixed Costs:** Expenses that **do not change** based on the volume of services provided (e.g., number of patients treated). You pay these regardless of whether you treat 1 patient or 1,000. Examples include rent, construction, and equipment depreciation.
- **Variable Costs:** Expenses that **change directly** depending on the volume of services. If you treat more patients, these costs go up. Examples include supplies, medicines, and disposable tools.

- Series (Questions 10-18): 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

Resources per year	Frequency per year	Unit cost for one unit (Chemotherapy A)	Unity cost for on unit (Chemotherapy B)
Drug regimen per patient	12	10 12x10=120	50 12x50=600
Disposable equipment per patient	36	8 36x8=288	8 36x8=288
Side effect treatment	25% for A, 30% for B	50 .25x50=12.5	70 .3x70=21
Other resources uses			
Monthly salary (capacity = 200 patients/yr)	12	400	400
Time of nurse needed to administrate chemotherapy (min)		30	30
Overtime salary per hr	12	30	30
Laptop		400	400
Chemotherapy unit overheads (lighting, heating) per month	12	50	50
Utility		0.8	0.5
LYG		0.2	0.4

> Variable cost

10) What's the variable costs for Chemotherapy A assuming full capacity?
    a. 84100
    b. 7600
    c. 89900
    d. 12220

11) What's the total costs for Chemotherapy A assuming full capacity?
    a. 84100
    b. 7600
    c. 89900
    d. 12200

12) What's the marginal cost for treating additional 40 patients for chemotherapy A?
    a. 432
    b. 600
    c. 500

13) Calculate average of total cost to LYG for B to A?
    a. 1628
    b. -1628
    c. 12200

14) What's the variable costs for chemotherapy B assuming full capacity?
    a. 84100
    b. 89900
    c. 181800

15) Calculate total cost / QALY for drug B to A?
    a. 84100
    b. 1628
    c. 12212

16) What's the total cost for drug B assuming full capacity?
    a. 187600
    b. 181800
    c. 84100

17) Is B cost effective compared to A?
    a. Needs threshold

18) ICER of B chemotherapy to A based on LYG?
    a. NE
    ~~***b. NW***~~
    c. SE

Metric	Full Name	Definition	Scale
LYG	Life Years Gained	A measure of extended survival. It counts the number of additional years a person lives due to a treatment, regardless of their health state.	**Time** (e.g., 0.5 years, 5 years, 10 years).
Utility	Health State Utility	A measure of preference or value assigned to a specific state of health. It reflects the quality of life during a given period.	**0.0 to 1.0** (typically). • 0 = Death • 1 = Perfect Health *(Negative values are sometimes used for states "worse than death").*

A. Variable Costs (Per Patient)

Costs that occur every time a new patient is treated.

- **Chemotherapy A:**
  - Drug: $12 \times 10 = 120$
  - Equipment: $36 \times 8 = 288$
  - Side Effects: $25\% \times 50 = 12.5$
  - **Total VC (A) = 420.5**
- **Chemotherapy B:**
  - Drug: $12 \times 50 = 600$
  - Equipment: $36 \times 8 = 288$
  - Side Effects: $30\% \times 70 = 21$
  - **Total VC (B) = 909** Drug + Equipment + Side Effects = Total VC

B. Fixed Costs (Annual)

Costs to run the facility for up to 200 patients.

- Monthly Salary: $400 \times 12 = 4,800$
- Laptop: 400
- Unit Overheads: $50 \times 12 = 600$
- **Total Fixed Cost = 5,800**

C. Health Outcomes (Annual Total for 200 patients)

- **Utility (QALYs):**
  - Chemo A: $0.8 \times 200 = 160$
  - Chemo B: $0.5 \times 200 = 100$
- **LYG (Life Years Gained):**
  - Chemo A: $0.2 \times 200 = 40$
  - Chemo B: $0.4 \times 200 = 80$

10) What's the variable costs for Chemotherapy A assuming full capacity?

Full capacity ->
for the whole 200 patients treated

- **Formula:** Variable Cost (A) × 200 patients
- **Calculation:** $420.5 \times 200 = 84,100$
- **Answer: a. 84100**

11) What's the total costs for Chemotherapy A assuming full capacity?

- **Formula:** Total Variable Cost + Total Fixed Cost
- **Calculation:** $84,100 + 5,800 = 89,900$
- **Answer: c. 89900**

12) What's the marginal cost for treating additional 40 patients for chemotherapy A?

- **Exam Intent:** The question asks for the specific cost of *extending capacity*. Since the nurses are maxed out, you must pay overtime.
- **Calculation:**
  - Time needed: $40 \text{ patients} \times 30 \text{ mins} = 1,200 \text{ mins} = 20 \text{ hours}.$
  - Overtime cost: $20 \text{ hours} \times 30 \text{ (overtime rate)} = 600.$
- **Answer: b. 600**

13) Calculate average of total cost to LYG for B to A?

- **Correction:** The question text says "LYG" but the math for the options uses "**Utility**". It is asking for the ICER (Incremental Cost-Effectiveness Ratio).
- **Formula:** $(\text{Cost B} - \text{Cost A})/(\text{Utility B} - \text{Utility A})$
- **Calculation:**
  - $\Delta\text{Cost} = 187,600 \text{ (see Q16)} - 89,900 = 97,700$
  - $\Delta\text{Utility} = 100 - 160 = -60$
  - $\text{ICER} = 97,700/-60 = -1,628.33$
- **Answer: b. -1628**

14) What's the variable costs for chemotherapy B assuming full capacity?

- **Formula:** Variable Cost (B) $\times$ 200 patients
- **Calculation:** $909 \times 200 = 181,800$
- **Answer: c. 181800**

Q15 Answer

Interpretation: "Total cost / QALY for drug B to A" asks for the **ICER**, the extra cost per additional QALY gained when switching from A to B.

Key Values: 488.5 is the ΔCost. The denominator is ΔQALY derived from multiplying **LYG** (0.4, 0.2) by **Utility** (0.5, 0.8) for each drug, yielding a **0.04** difference.

Calculation: ICER = $\frac{488.5}{(0.4 \times 0.5) - (0.2 \times 0.8)} = \frac{488.5}{0.04} = \mathbf{12,212.5}$

Final Answer: c

16) What's the total cost for drug B assuming full capacity?

- **Formula:** Total Variable Cost (B) + Total Fixed Cost
- **Calculation:** $181,800 + 5,800 = 187,600$
- **Answer: a. 187600**

17) Is B cost effective compared to A?

- Reasoning:
  - B is **More Expensive** ($187,600$ vs $89,900$).
  - B provides **More Life Years** (0.4 vs 0.2).
  - Since you pay more to get more benefit (LYG), it is a trade-off. To decide "Yes" or "No", you need a **Willingness-to-Pay Threshold** (e.g., are we willing to pay $50,000 for one extra year of life?).
- **Answer: a. Needs threshold**

18) ICER of B chemotherapy to A based on LYG?

- Reasoning:
  - ΔCost is **Positive (+)** (B costs more).
  - ΔEffect (LYG) is **Positive (+)** (B gives more life years).
  - On the Cost-Effectiveness Plane, the quadrant where both Cost and Effect are positive is the Top-Right, or **North-East**.
- **Answer: a. NE**

19) Doctor’s salary when the patient is paying for a service with 80% insurance coverage, is from which perspective?

a. Patient
b. Provider
c. Payer & Patient
d. <u>All of the above</u>

In this specific type of question, the "cost" of the doctor's salary is viewed as a resource consumption that impacts everyone:

- **Provider:** Pays the salary directly.
- **Payer (Insurance):** Funds the bulk of the salary through reimbursement.
- **Patient:** Contributes to the salary through premiums and co-pays.

Therefore, the financial burden flows through all three parties.

20) The water used to reconstitute the paracetamol syrup is considered _____ cost.

a. direct overhead costs
b. direct capital costs
c. none of the above
d. Indirect cost
e. ***<u>direct variable costs</u>***

To classify this cost, we look at two main characteristics:

1. **Direct vs. Indirect:**
   - **Direct:** The water is physically incorporated into the final product (the paracetamol syrup) that the patient receives. You can easily trace this cost to the specific product. Therefore, it is a **Direct** cost.
   - *Contrast:* Electricity for the pharmacy lights would be an *indirect* cost because you can't trace it to a specific bottle of syrup.
2. **Variable vs. Fixed:**
   - **Variable:** The amount of water used changes (varies) based on how much syrup you prepare. If you make 10 bottles, you need 10 times the water. Therefore, it is a **Variable** cost.
   - *Contrast:* The rent for the pharmacy building is a *fixed* cost because it stays the same regardless of how many bottles you make.

Since the water is both **traceable to the product** and **varies with volume**, it is a **Direct Variable Cost**.

21) Mammogram screening test is considered:
    a. Direct overhead costs
    b. Direct variable costs
    c. Indirect cost
    d. Direct capital cost

22) Two hypertension treatments are being compared on a national level, drug A costs 10JD and reduced BP by 10mmHg, drug B costs 25JD and reduced BP by 40mmHg. What's the type of analysis?
    a. CEA Cost-Effectiveness Analysis
    b. CBA
    c. Cost description
    d. Outcome description

23) True about utility:
    a. Scale ranges from 0 which is death, to 1 which is complete health.

24) Pain and suffering are considered?
    a. Direct variable
    b. Indirect costs
    c. Intangible costs

The statement that "**Pain and suffering are considered intangible costs**" means that these are non-monetary and non-directly measurable burdens associated with an illness or treatment.

25) Paid hourly costs outside clinic is considered?
    a. Direct variable
    b. Indirect costs
    c. Fixed costs

26) Effectiveness of one alternative:
    a. Effectiveness description ? (not sure about the question)

27) A study is comparing the effect of 75mg of Oseltamivir 2 times/day compared to zanamivir, type of analysis?
    a. CEA
    b. CUA
    c. CBA

28) Comparing cost & LYG of two or more alternatives is considered?
    a. CBA
    b. CEA
    c. Cost analysis

29) QALY is biased due to ? Quality-Adjusted Life-Year
    a. It's a generic measure
    b. It's subjective and can change during the clinical course of the disease

30) Cost of illness:
    a. Description of clinical & economic outcome of two or more treatment options

31) Fasting blood glucose is considered:
    a. Direct variable
    b. Indirect
    c. Fixed

32) True about QALY?
    a. Represents quality and quantity

33) Heating is considered?
    a. Overhead

- **Definition:** Overhead costs are ongoing business expenses that are necessary to run the business but **cannot be directly traced** to the production of a specific product or service.

34) True about efficiency?
    a. Greatest benefit with reasonable cost

35) False about QoL? Quality of Life
    a. Preference based measures (?? can't remember it)

Incremental Cost-Effectiveness Ratio

36) When is ICER necessary?
    a. NE
    b. NW
    c. SE

NE stands for the **North-East** quadrant of the Cost-Effectiveness Plane.

The ICER is used when a new intervention is:

- **More Expensive** (Higher Cost: **North** on the Y-axis)
- **More Effective** (Better Outcome: **East** on the X-axis)

- Series (Question 37,38) table showing benefit total = 600, cost total = 450

37) What's the benefit to cost ratio?
   a. 2
   b. 1.5
   c. <u>1.3</u>

600/450

38) What's the net benefit value?
   a. <u>150</u>
   b. 200
   c. 300

600-450

39) Copayment paid by the patient is related to which perspective?
   a. Provider
   b. <u>Patient</u>
   c. Payer

40) Returning early to work is:
   a. Direct cost
   b. <u>Indirect cost</u>
   c. Intangible cost

In health economic evaluations (especially those taking the **societal perspective**), costs are broadly divided:

1. **Direct Costs:** The costs of the healthcare intervention itself (e.g., doctor visits, drugs, hospital stays) and related non-medical costs (e.g., patient travel).
2. **Indirect Costs (Productivity Costs):** The monetary value of the loss of production (output/wages) resulting from illness, disability, or premature death.

When a healthcare intervention, such as an early return-to-work (RTW) program, allows a patient to return to work *sooner* than they otherwise would, it **reduces or avoids** the costs associated with lost productivity (e.g., sickness benefits, lost wages, hiring replacement workers). This reduction is classified as a saving in **Indirect Costs**.

41) All direct costs except:
   a. <u>Anxiety</u>

42) Evaluate cost of one drug?
   a. <u>Cost description</u>

43) True about CBA? Cost-Benefit Analysis
   a. <u>Can compare health to non-health related costs</u>
   b. ICER can benefit the society
   c. Most common used

Cost-Benefit Analysis (CBA) is unique among economic evaluation methods because it requires that **all costs and all benefits**—whether they are health outcomes (like lives saved, reduced morbidity) or non-health outcomes (like a new road, increased tourism, or reduced crime)—must be converted and expressed in a single, common unit: **monetary value** (e.g., dollars).

44) Transferring a patient from day-care to home based service?
    a. Direct Medical to non-medical
    b. Direct Medical to indirect

45) A form of analysis that delas with quantity and quality of life?
    a. CEA
    b. CUA Cost-Utility Analysis
    c. Cost analysis
    d. Effect analysis

46) An example of a variable?
    a. Exam papers
    b. Seats
    c. Lecturer

47) True about indirect costs?
    a. Considered from payer perspective if the patient is one of its employees

48) Drug B = 40 JDs, LYG = 5… Drug A = 10JDs, LYG = 1
    ICER from A to B means?
    a. Costs that can be saved from moving from drug A to B to obtain extra life years
    b. Extra costs paid to move from drug A to B to obtain extra life years

49) Outcome measure for cost benefit analysis?
    a. QALY
    b. WTP (willing to pay)

50) Opportunity cost of choosing to buy a laptop over iphone?
    a. Benefit gained by buying a laptop
    b. Benefit that's forgone from not buying the iphone