#HafezHamam

THANKS FOR AHMAD AL-TANJY.ABDULAZIZ AL-SHAMALI FOR COLLABORATION IN THE 1ST PART OF THE LECT WITH THE DOCTOR 🙏😊

Pharmacoeconomics
Discounting

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Undevated Topic حسب الدكتورة

Learning outcomes

- **By the end of the lecture, you will be expected to:**

  - Understand discounting technique

  - Understand the rationale for discounting in Health economics

  - Understand the time preference for income today rather than income in the future

  - Understand the way discounting adjusts for costs (and benefits) occurring at different points in time.

Think what would you prefer

- To be given 100 JDs today or after 5 years?
  - Hint (think of this in term opportunity cost associated with deferred consumption; i.e. **the value of what is foregone by not having the $100 over the next five years (% of interest)**

$100 five years from now is valued less than $100 today

Think what would you prefer

- If I ask you to borrow 1000 JDs today and assured you to pay them back in the next 3 years.

- You wouldn't agree to lent me the money unless I paid you back more than 1000.
- Money promised in future, health cost savings promised in future is valued less than money received today

الليرة تبقى ليرة لكن بسبب
قيمتها الشرائية بتقل (التضخم)
SSo to generate benefit: استثمر

WHY value of money decrease overtime?

✓ People prefer to receive money now rather than later because they can generate benefits immediately

✓ People prefer to pay out money later rather than now

People preferre method

eg : pt ⟶ surgery or Meds

(السعر: 3000 دينار)

(السعر: 240 دينار سنة)

بالنسبة للمريض أفضل اله ⟶ لكنه استخدم باقي الفلوس لـ 3000 وما صرفها مرة وحدة .

next slide

+no

لكن بالنسبة للمريض ؟
لا يقابلها benefit رأي الـ surgery أفضل ، قابل surgery فوري .

PAID

Another example

- Think of the benefit or outcomes of surgery vs. long-term treatment with medication for knee pain ?

- **In this situation, surgical costs are incurred in the present, whereas medication costs stretch well into the future.**

DISCOUNTING

خصم

We want to predict the future cost.

- Discounting is an economic method that captures an individual's preference for income today rather than income in the future.

- This time preference is often explained by the opportunity cost of interest. Income earned today can earn interest through investment.

الرقم يمثل قيمة المصاري لو احنا دفعناها بالـ present

- In numbers;

- an interest rate of 3 %, a payment of $100 today is worth more than the same payment in one year because JDs 3 of interest can be earned if the payment is received today

الـ ١٠٠ دينار بعد سنة كم حتصير (Present value) رح تطلع ١٠٣ ٩.٠٣

- You would have 103 JDs (PV = payment/ $(1+r)^n$. r is the interest rate. (معدل) بتغيره مع الوقت لو الربح من البنك المركزي
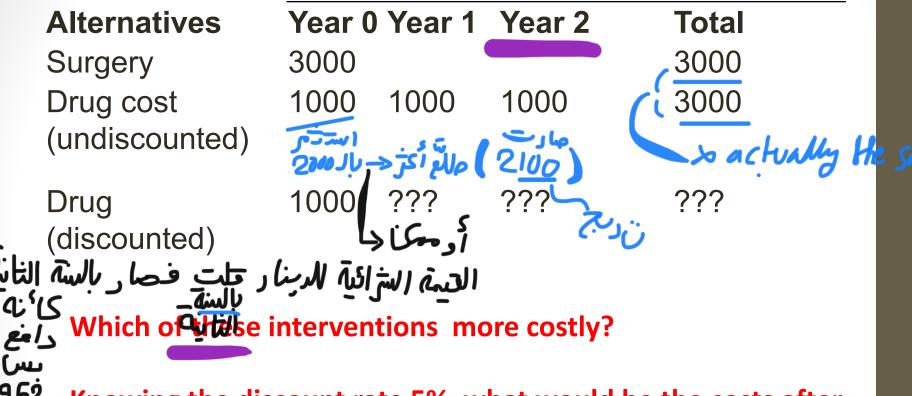
١٠٠ (Future value)

numb of years

Discount Rate for Future Costs

- Determination of the most appropriate discount rate for costs in economic analyses is still being debated by health economists, though typically rates of 3% to 5% are used.

- Discounting occur when intervention lasts for more than one year. Not discounting will lead to overestimate the future costs and benefit.

- In practice, most health economists agree that it is reasonable to select a central "**best estimate**" of the discount rate, such as 2%, and to then determine the effect that higher and lower rates (e.g. 2% to 6%) have on study findings and conclusions (i.e. sensitivity analysis).

-

| Present value (PV) | ← discounting | Future value (FV) |

- In any economic evaluation where costs and benefits occur over a number of years should consider discounting.

- Discounting adjusts for costs (and benefits) occurring at different points in time.

Example

Alternatives	Year 0	Year 1	Year 2	Total
Surgery	3000			3000
Drug cost (undiscounted)	1000	1000	1000	3000
Drug (discounted)	1000	???	???	???

Which of these interventions more costly?

Knowing the discount rate 5%, what would be the costs after year 1 and 2?

Answers

Alternatives	Year 0	Year 1	Year 2	Total
Surgery	3000			3000
Drug cost (undiscounted)	1000	1000	1000	3000
Drug (discounted)	1000	952	907	2859

- **What do you think?**

Answers

- Costs occurring in Years 1 and 2 are discounted with Year 2 costs discounted at a higher rate

- Future costs are given less weight because they "impose" on us less than an equivalent cost arising now

(كل ما يأتي بالدفع الـ discount
بزيه)

Inflation التضخم

- Inflation refers to the general upward of the service or good price over time
  - For example the unit cost (price) of drug will be higher in 2018 as compared to 2017
- Adjusting for inflation by using a constant price weight to value all services, most commonly using the year when the trial is stopped (2015-2012) كان مثلاً الدراسة بالدراسة آخر سنة ر we take it.
  - Such as using 2018 price weight to value all resource uses even if the resource uses were collected over a period of years
  -

Inflation versus Discounting

- Inflation is concerned with the unit cost (price) whereas discounting (time preference) concerned with when the total cost have been consumed.

- Adjusting for inflation or not is based on whether we choose a constant or time varying price to value the resource use. The latter occur if we used hospital billing data to cost outpatient care observed over a period of time.

- Adjusting for time preference occur if patients or participants in the trials are followed for more than one year.

Price weight	*inflation better* ↑ **Less than one year**	**Patient follow-up** *discounting better* ↗ **More than one year**
Constant	Do not adjust for inflation; do not discount	Do not adjust for inflation; discount
Time varying	Don't adjust for inflation; do not discount	Adjust for inflation; discount

Think about this

- If the patients were enrolled in the trial during a 3-year period, but each is followed for one year only. In addition, the investigators collect hospital bills to estimate inpatient cost.

- Do we need to adjust for inflation and discounting?

Summary

- **Discounting is a technique used to reflect the present value of a cost or health benefit that will occur at some future date.**

- Future costs are discounted to account for the time value of money, and future health benefits are discounted to account for the delay in satisfaction from these outcomes.

- **The effect of discounting is to give future costs and health benefits less weight in an economic analysis.**

- Economics call discounting the notion of time preference