

# The Economics of Health: How do we decide?



## Maximising Survival

- You are the business manager of a hospital department.
- Two drugs, A and B, are recommended by NICE for the treatment of a life-threatening illness. The doctors want everyone suffering from this illness to have the best treatment, but you only have a limited budget.
- In this activity, you are going to find out the best survival rate that can be achieved within your budget, then modify your projection by developing a more detailed model.

Your budget for this illness: £3,000,000 per year

Treatment	Survival rate (% surviving for 1 year)	Cost per patient per year (£000)
A	61	10.3
B	83	34.1

1. If your budget was unlimited, you would use treatment B for all patients. If you have 100 patients in a year, how many would you be able to save, and how much would that cost in £? (Don't forget that patients who don't survive will still have had the treatment, so must be included in the cost). How much is this over your budget?

Given that not all 100 patients can have treatment B, you must find the highest number you can treat with B without going over budget.

2. Complete this table for 100 patients, calculating the number expected to survive and the cost of treatment for different ways of allocating treatment.  
(Each row allocates Drug B to a given number of patients and Drug A to the remainder).

No. of patients on B	No. surviving 1 year	Cost for 1 year (£ millions)	No. of patients on A	No. surviving 1 year	Cost for 1 year (£ millions)	Total no. survivors	Total cost (£ millions)
100			0				
75			25				
50			50				
25			75				
0			100				

3. What initial estimate does this give you for the number of patients who can be treated with treatment B?

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- Use your table to plot a graph of the total cost in £ millions (vertical axis) against the total number of survivors (horizontal axis).
- What is the best estimate you can give now for the maximum number of survivors?
- If the number of patients taking A is  $x$ , write down the number of patients taking B, and then write down and simplify an equation for the total cost in £millions,  $C$ .
- Use this equation to find a value for the maximum number of people who can take B, and hence the maximum number of survivors – this needs to be a whole number, and you must ensure you do not go over budget.

## Developing the model

Some 25% of patients are less severely affected by the illness than others, and therefore have a better survival rate and cost less to treat.

### Mild illness

Treatment	Survival rate (% surviving for 1 year)	Cost per patient per year (£000)
A	90	7.7
B	98	25.5

### Severe illness

Treatment	Survival rate (% surviving for 1 year)	Cost per patient per year (£000)
A	56	10.3
B	79	34.1

- Can you now afford to offer everyone treatment B?
- If you offer treatment B to all those who have the severe form of the illness, how many of them will survive? How much money do you have left for those with the mild form?
- What is the best treatment you can offer to the 25 people with the mild form of the disease. How many do you expect to survive?
- If everyone with the severe form of the illness takes treatment B, and you do the best you can for those with the mild form, how many people survive in total?
- If everyone with the mild form of the illness takes treatment B, and you do the best you can for those with the severe form, how many people survive in total?
- On the basis of all your calculations, what would your recommendation be to the doctors in your department?