

Module 3: Lecture 3c.

Equity-Efficiency Trade-Offs in Health

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Economics of Health and Health Care

Overview

Objective: Understand equity-efficiency trade-offs in health

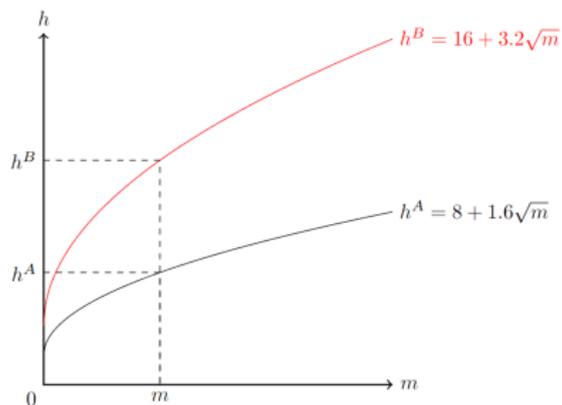
Methods

- Health Production Possibilities Frontier
- Equity-Efficiency Trade-Offs
 - Equity Impact Plane
 - Social Welfare Function

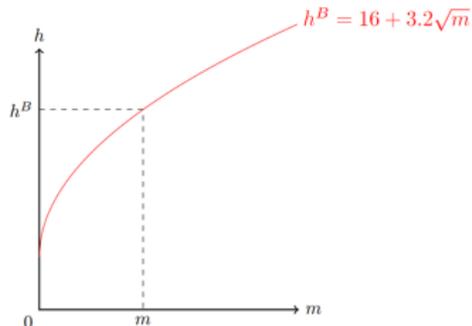
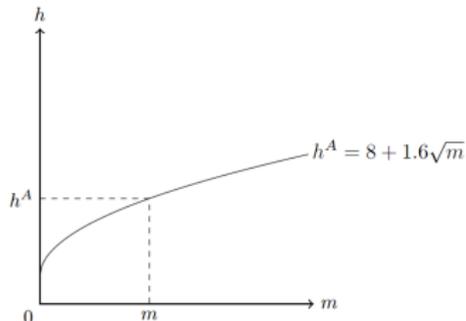
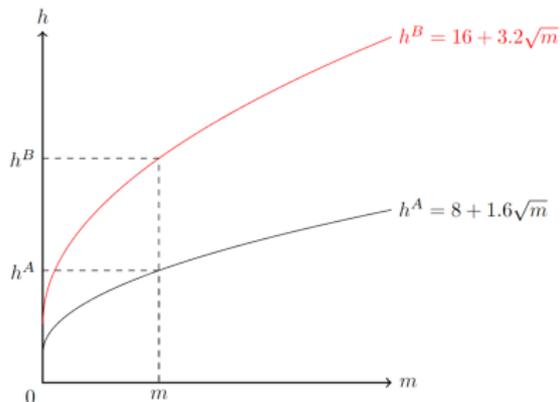
From Individual to Population Health

- We start with a simple economic model
- From one individual to a population of two individuals
- To understand the mechanisms which affect the distribution of health
- Enabling targeted policy intervention to reduce inequalities.

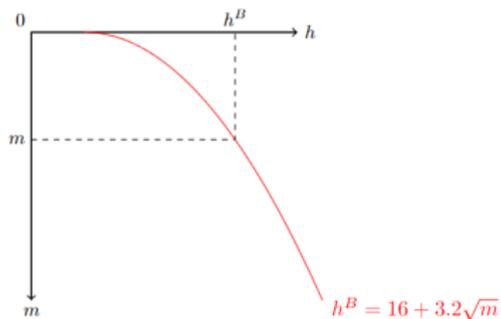
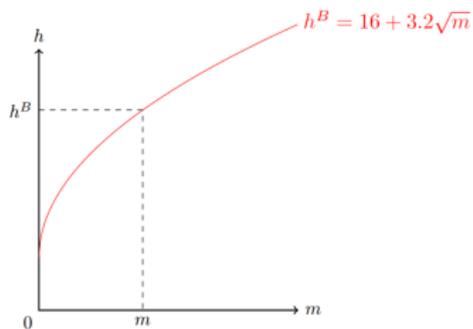
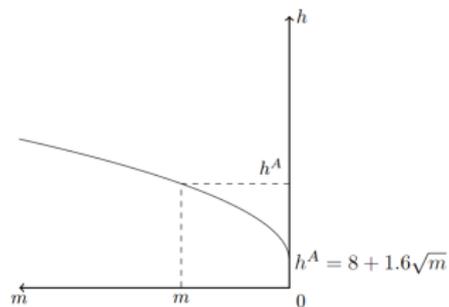
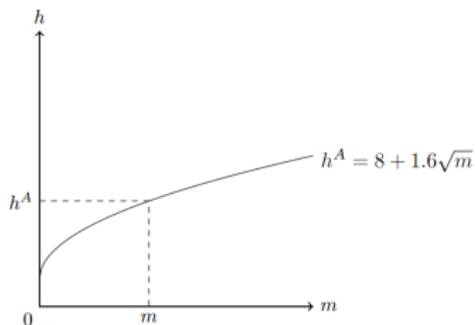
Individual to Population Health



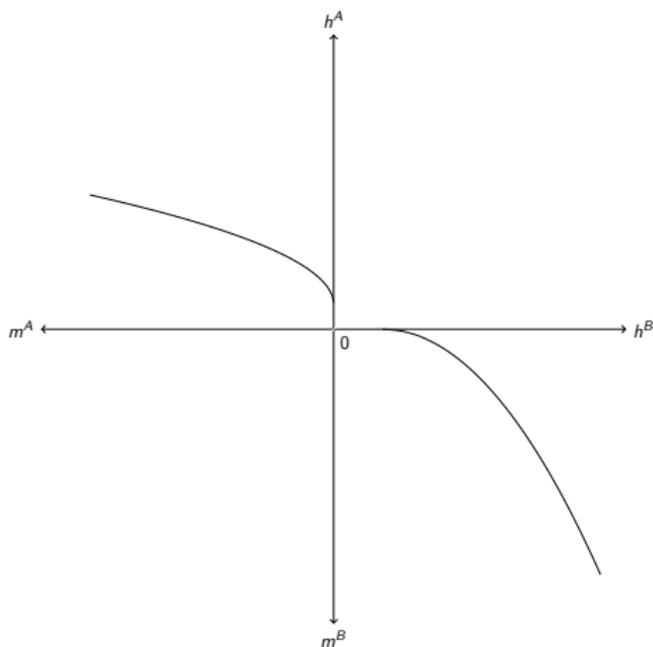
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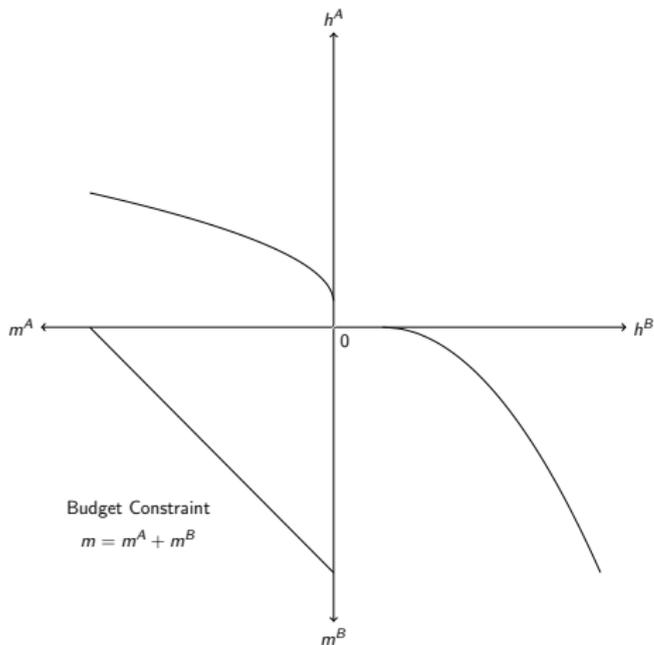
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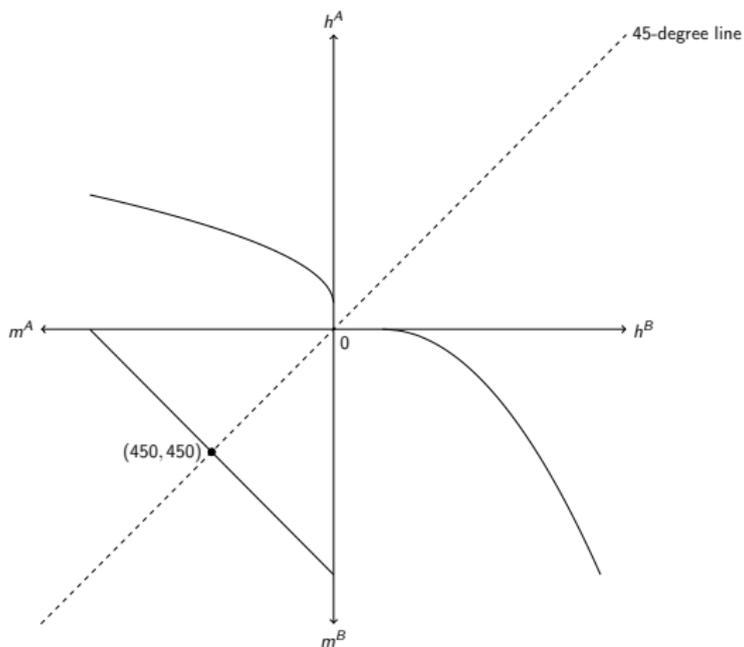
Health Production Possibility Frontier (PPF)



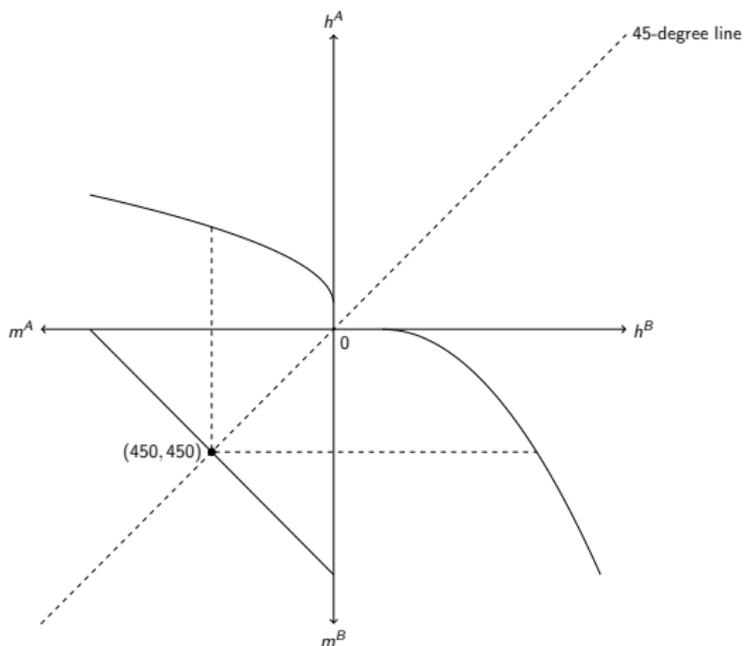
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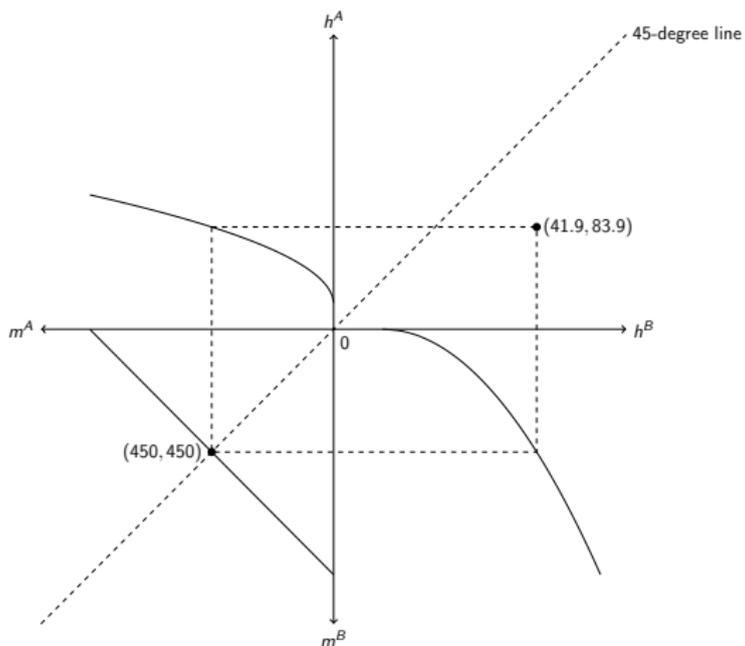
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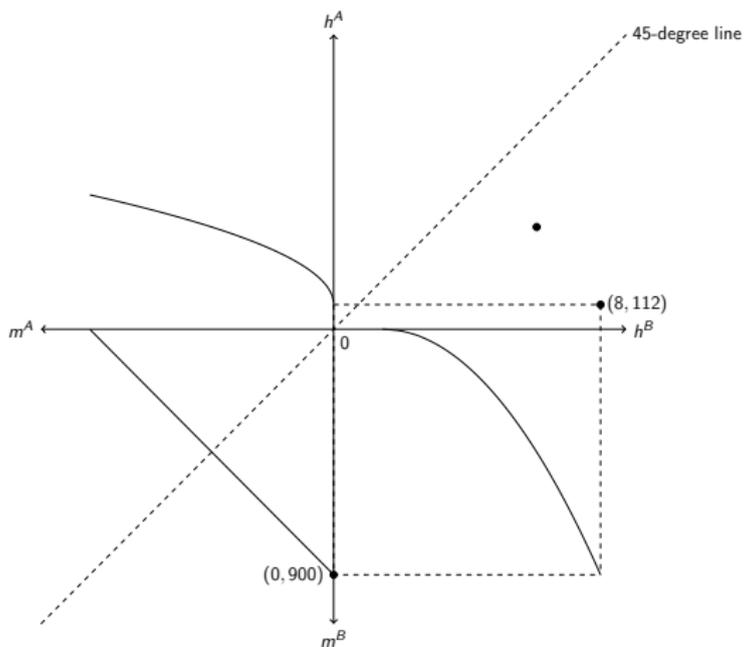
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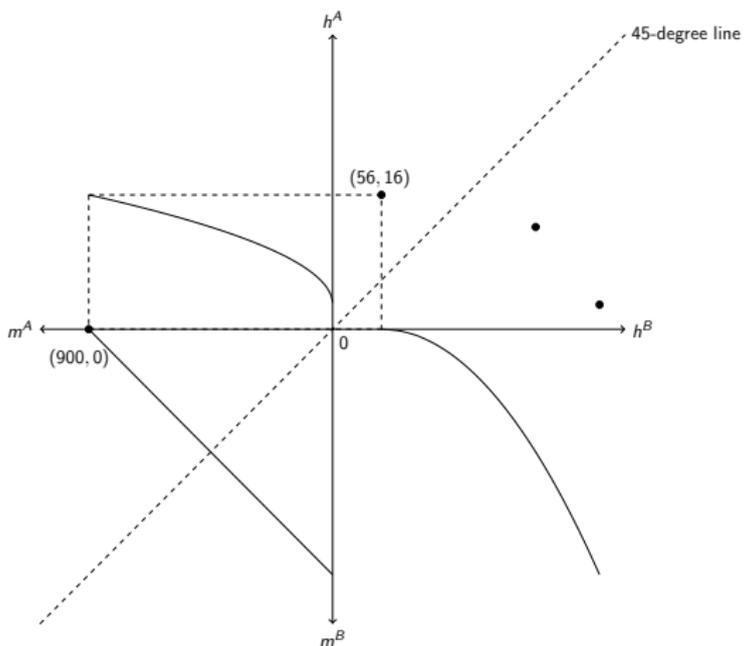
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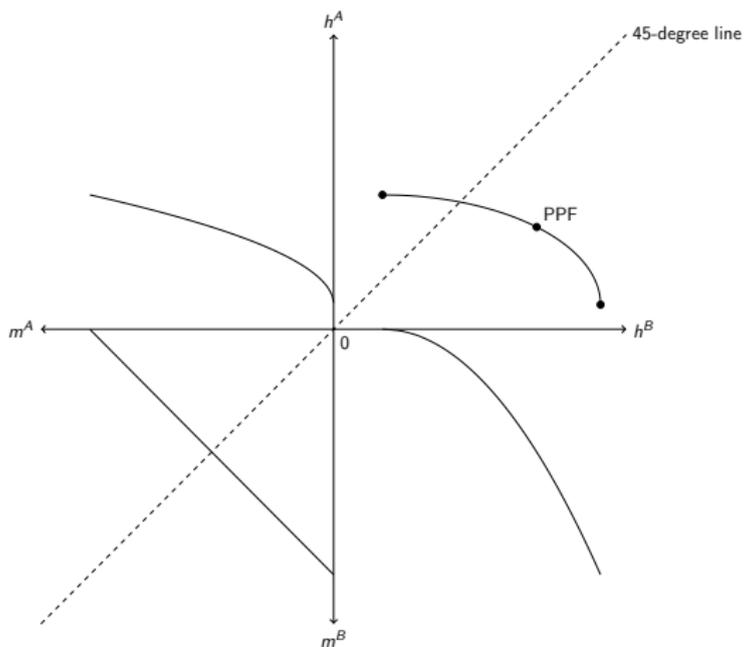
Health Production Possibility Frontier (PPF)



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Health Production Possibility Frontier (PPF)



Policy and the PPF

Illustrates three determinants of the distribution of health

- ❶ Level of budget, $m \rightarrow$ level of health spending
- ❷ Health production functions, $h_i(m_i) \rightarrow$ effect of health spending
- ❸ Distribution of medical resources, $[m_a, m_b] \rightarrow$ distribution of spending on health

Policy and the PPF

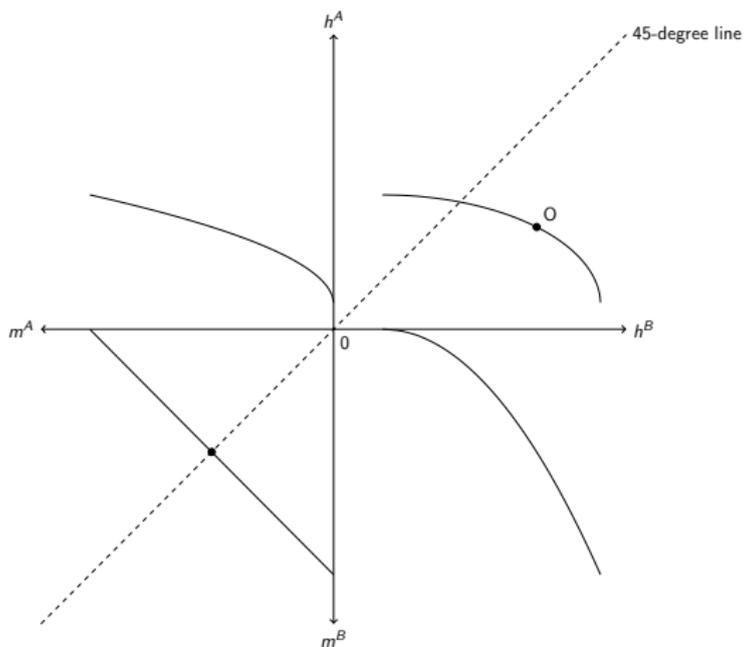
Illustrates three determinants of the distribution of health

- I Level of budget, $m \rightarrow$ level of health spending
 - Should depend on Value of Health (Module 3)
 - Will depend on economy & politics
- II Health production functions, $h_i(m_i) \rightarrow$ effect of health spending
 - Production of Health (Module 1)
 - Change baseline health through Health Behaviour (Module 4)
 - Change productivity via Grossman (Modules 1 & 4)
- III Distribution of medical resources, $[m_a, m_b] \rightarrow$ distribution of spending on health
 - Determined by Health Policy (Module 5)
 - For efficiency, guided by Health Technology Assessment
 - For equity, guided by social preferences (this lecture)
 - In reality, guided by politics & interest groups

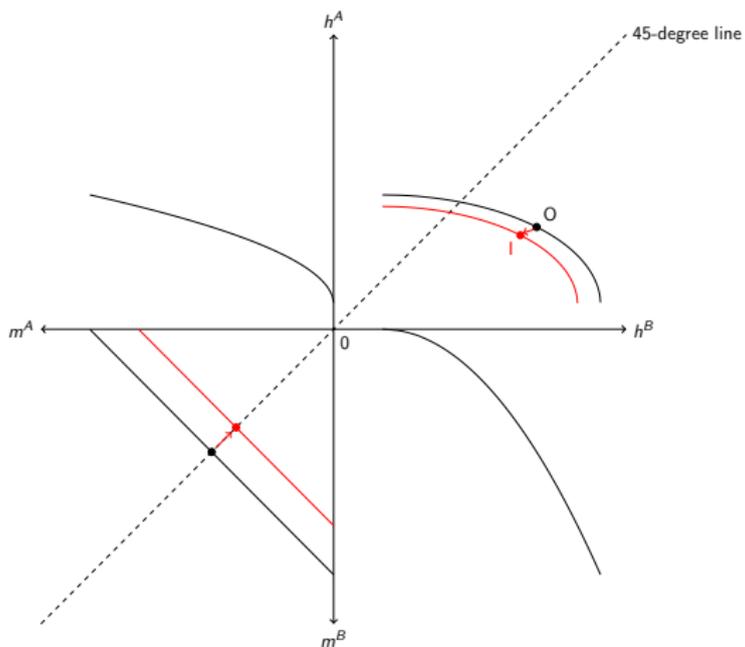
Abstract vs Real-World

- In this lecture, I will keep this quite abstract as these concepts can be applied to many interventions and public policies
- However, in the Exercise Lecture there are three real-world examples which correspond to this abstract setting
- If you find this Lecture too abstract, take a look at Question 2 of the Exercise Lecture and then return to these slides.

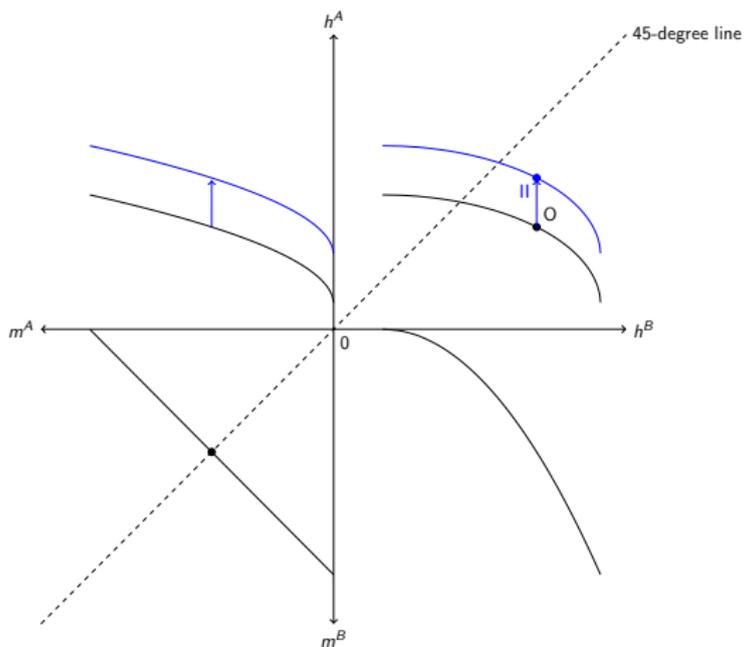
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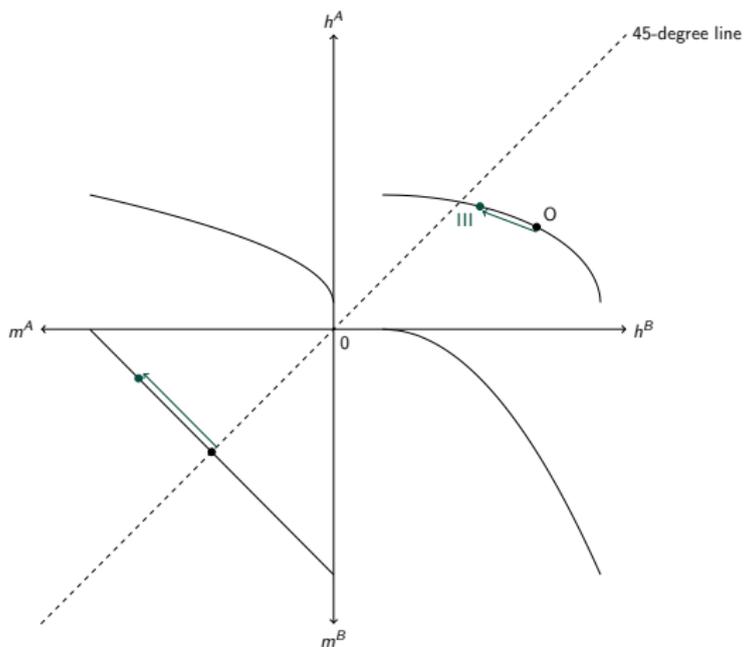
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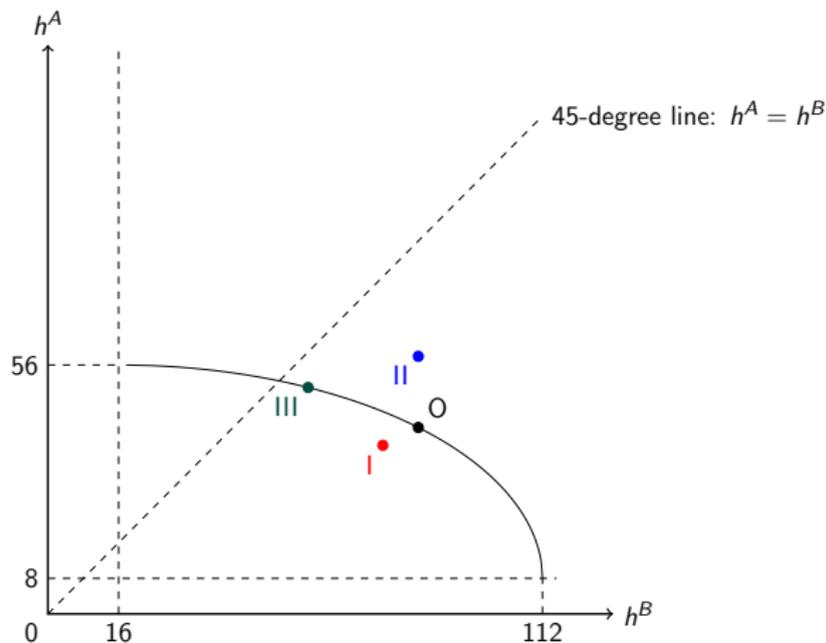
Policy and the PPF



Policy and the PPF



Health Production Possibility Frontier (PPF)



Policy Choice

- Now we know three possible policy options: I, II, and III
- But which would we choose?
- To decide, we need to know the effects of these options.

Equity-Efficiency Impacts

Table: Policy Outcomes and Effects

Policy	Health		Summary	
	h_A	h_B	Mean	Min
O	41.9	83.9	62.9	41.9

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<i>Outcomes</i>	I	35.2	70.3	52.7	35.2

Equity-Efficiency Impacts

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		Health		Summary	
Policy		h_A	h_B	Mean	Min
	O	41.9	83.9	62.9	41.9
<i>Outcomes</i>	I	35.2	70.3	52.7	35.2
<i>Effects</i>	I	-6.8	-13.6	-10.2	-6.8

Equity-Efficiency Impacts

Table: Policy Outcomes and Effects

		Health		Summary	
Policy		h_A	h_B	Mean	Min
O		41.9	83.9	62.9	41.9
<i>Outcomes</i>	I	35.2	70.3	52.7	35.2
	II	57.9	83.9	70.9	57.9
	III	50.9	58.9	54.9	50.9
<i>Effects</i>	I	-6.8	-13.6	-10.2	-6.8
	II	16.0	0.0	8.0	16.0
	III	9.0	-24.9	-8.0	9.0

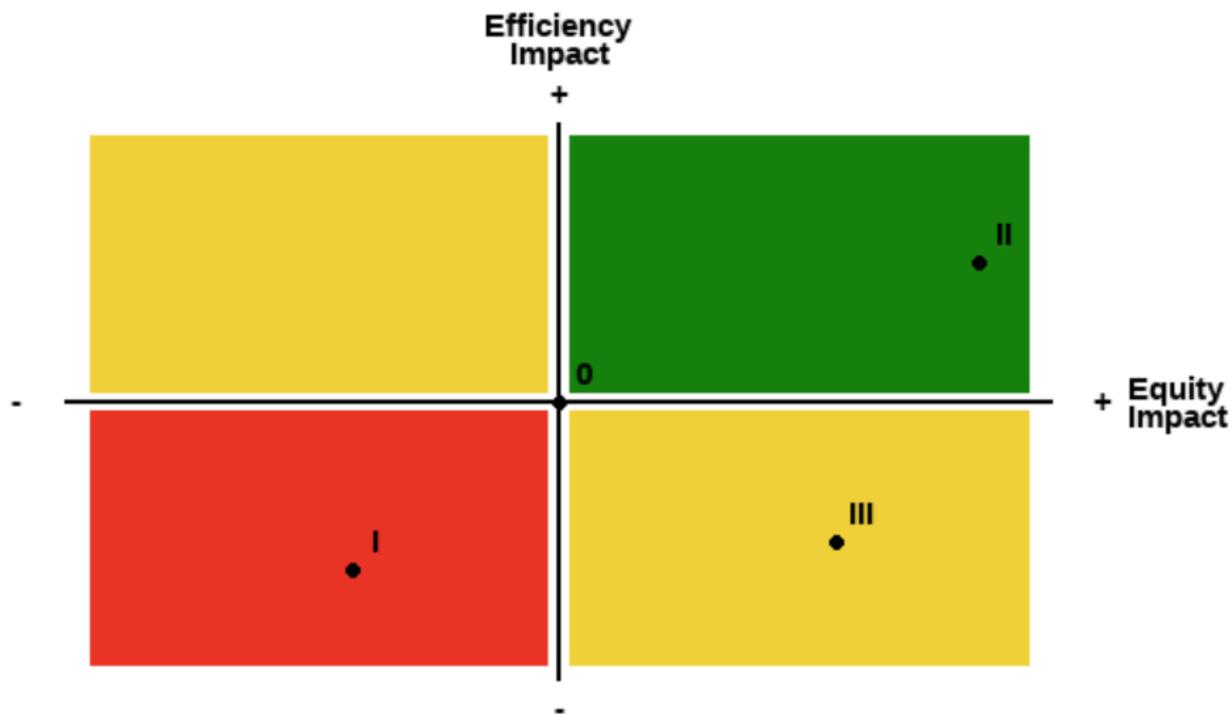
Policy Choice

- There are trade-offs between equity and efficiency, this makes the choice difficult
- We can visualise this trade-off using an equity impact plane

Equity Impact Plane



Equity Impact Plane



Policy Choice

- The equity impact plane is a useful way of illustrating the trade-off between equity and efficiency
- Particularly useful for decision makers who must choose between alternative policies, drugs or interventions (e.g. NICE in the UK)
- However, it is difficult to make consistent decisions between policies.
- For that we can use social welfare functions...

Social Welfare Function

- A social welfare function summarises an entire distribution (of health) with a single numerical value
- The higher the value, the greater the social welfare
- It is flexible and allows for different preferences related to equity and efficiency trade-offs
- For any given preference the social welfare function can be used to rank alternative distributions (i.e. to identify which policy is preferable)

Equally Distributed Equivalent

- The Equally Distributed Equivalent (EDE) is an intuitive measure of social welfare
- The EDE is the level of health “which if equally distributed would give the same level of social welfare as the present distribution” (Atkinson, 1970)

Figure: Atkinson Social Indifference Curves

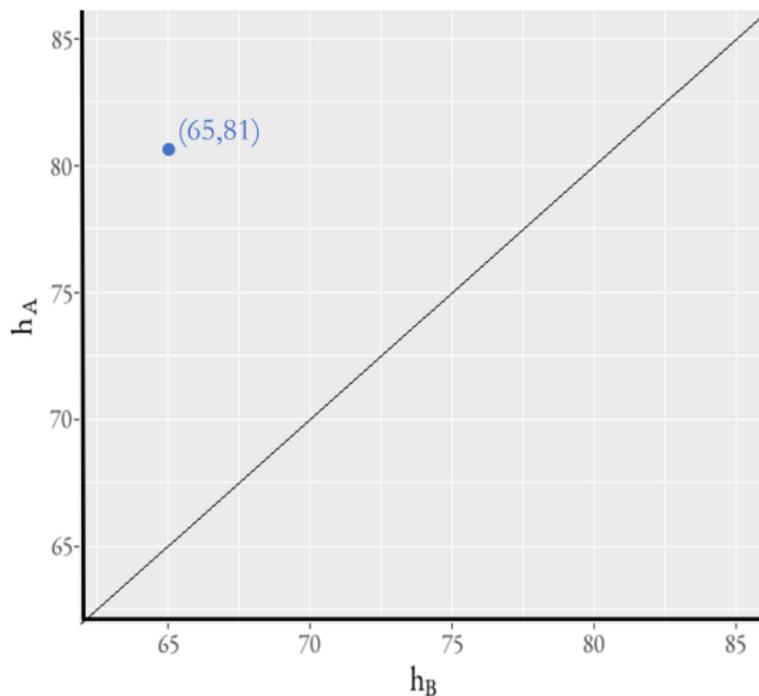


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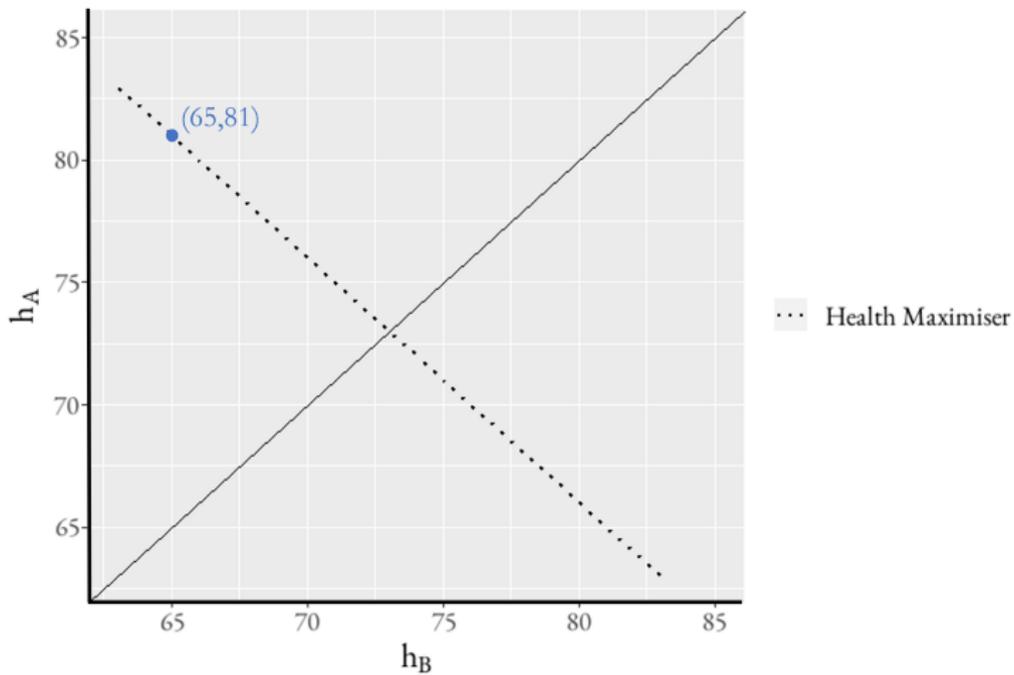


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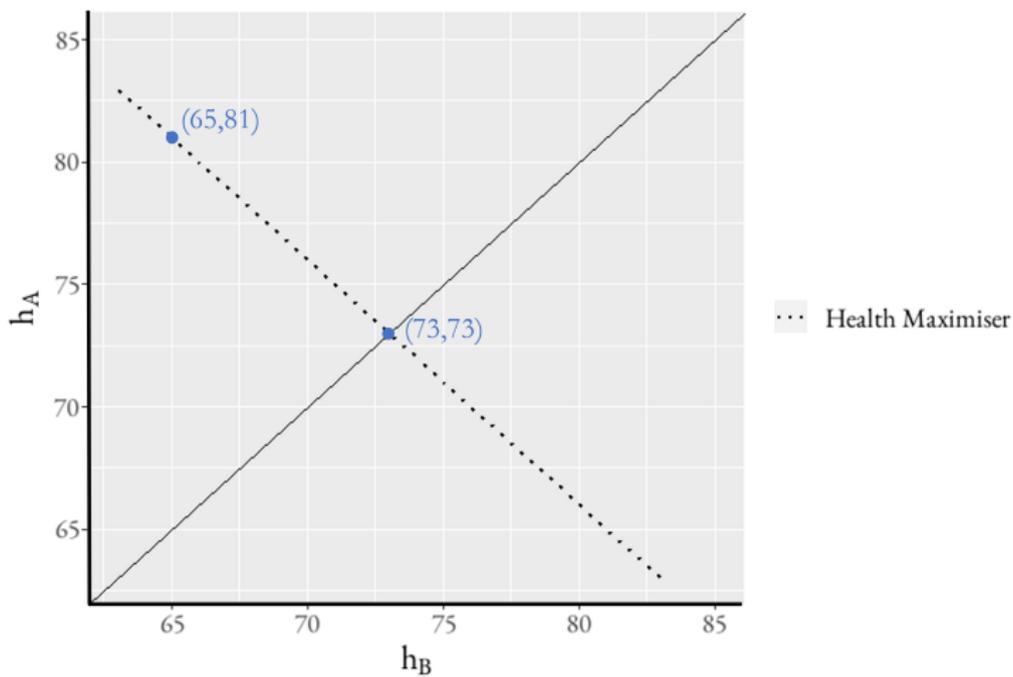


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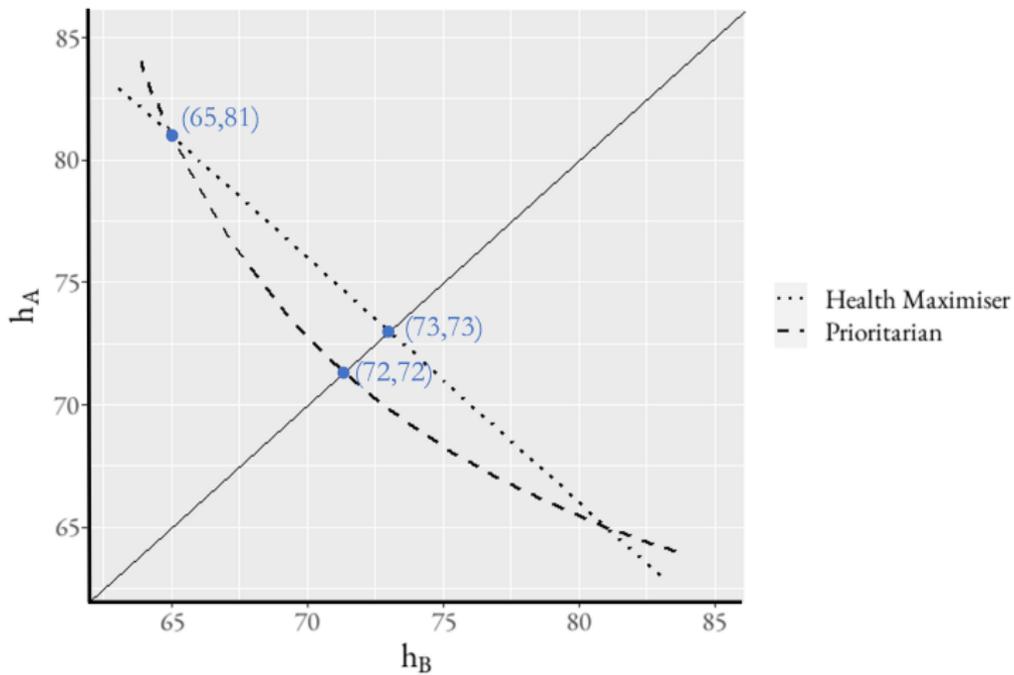
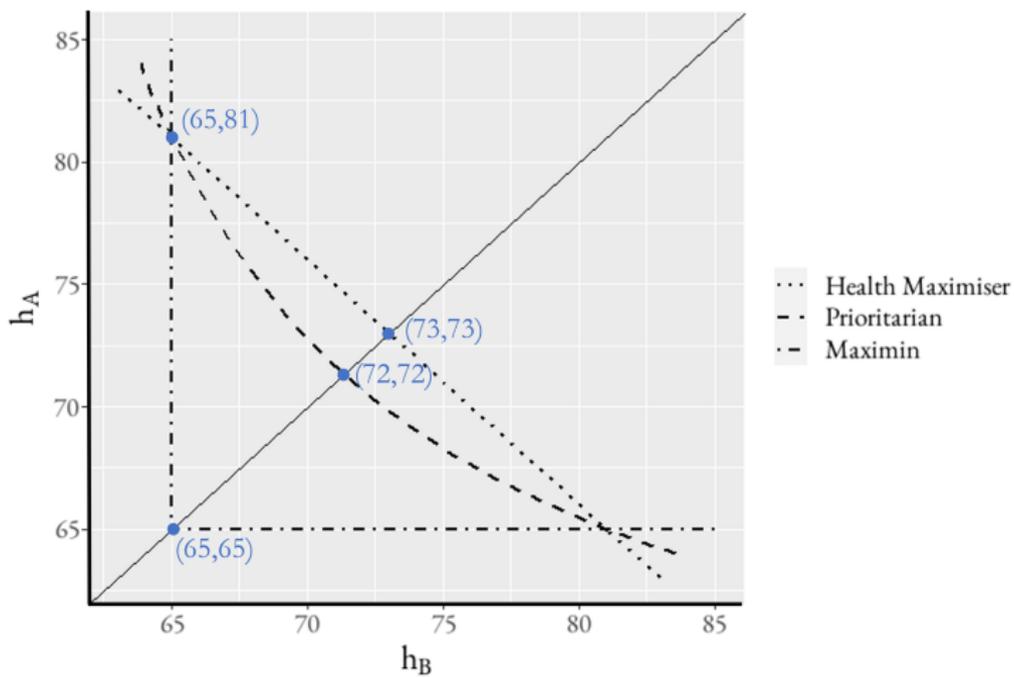
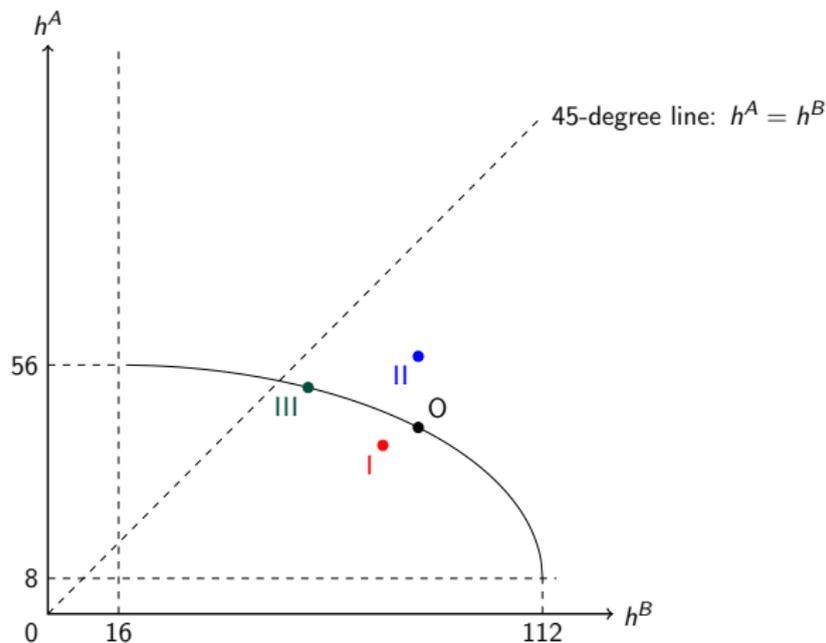


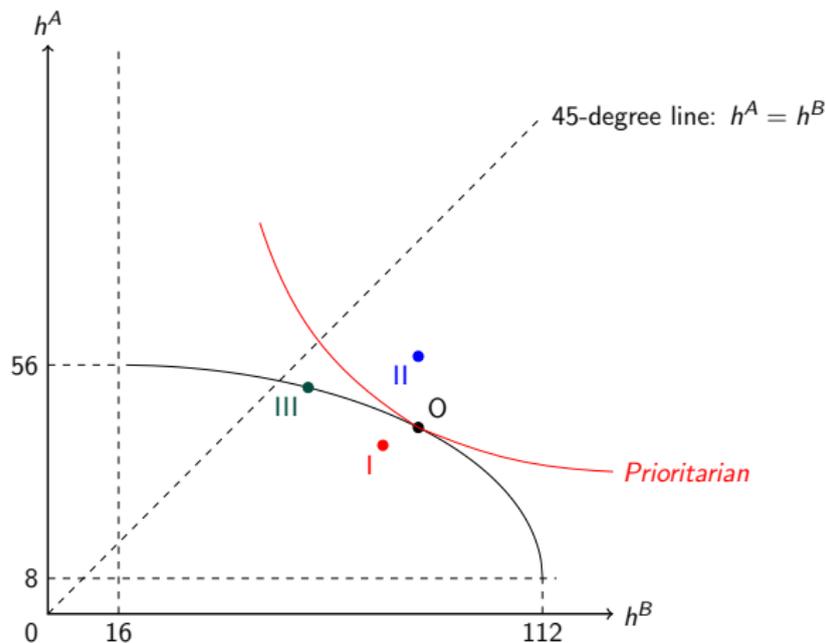
Figure: Atkinson Social Indifference Curves



Social Choice and the PPF



Social Choice and the PPF



Social Welfare and Policy

Table: Social Welfare and Policy

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I	35.2	70.3
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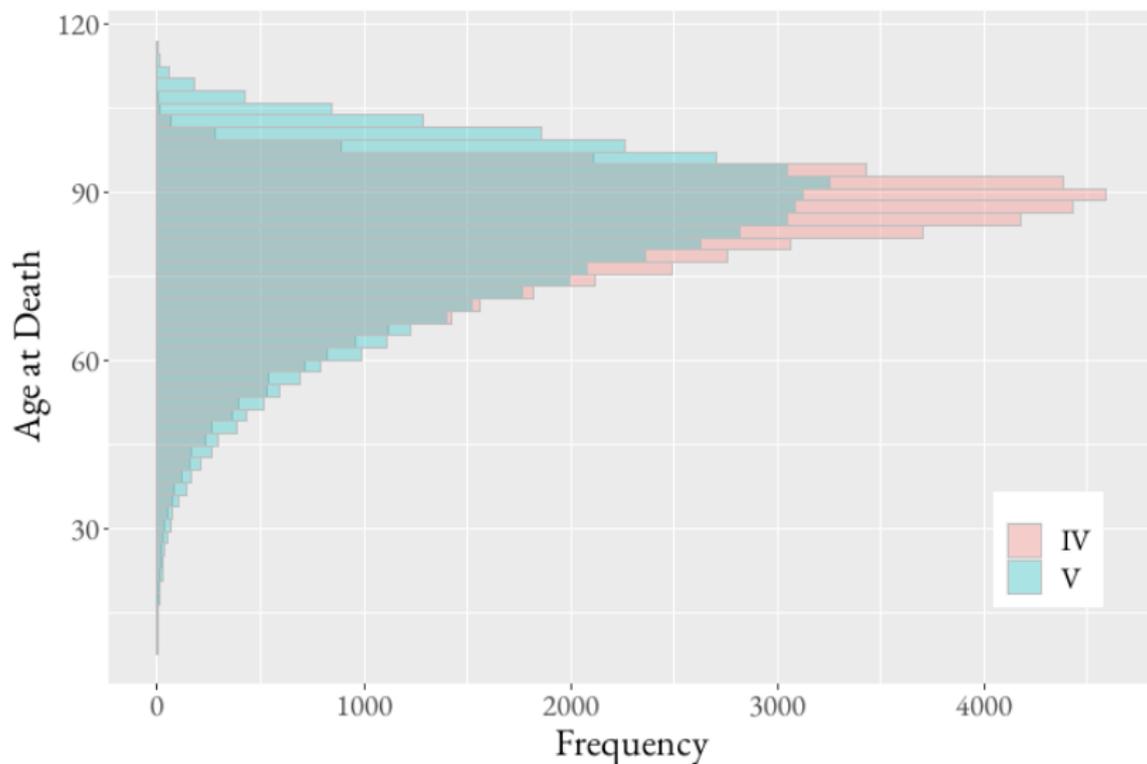
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Table: Social Welfare and Policy

Policy	h_A	h_B
O	41.9	83.9
I	35.2	70.3
II	57.9	83.9
III	50.9	58.9

Policy	Social Welfare		
	Health Max.	Prioritarian	Maximin
O	62.9	55.9	42.5
I	52.8	46.9	35.7
II	70.9	68.5	58.7
III	54.9	54.6	51.6

Social Welfare and Policy: Population Level



Social Welfare and Policy: Population Level

Table: Social Welfare and Policy

Policy	Social Welfare		
	Health Max.	Prioritarian	Maximin
IV	80.83	78.18	13.6
V	81.68	77.76	9.26

Social Welfare Functions

- This framework can be used to evaluate any health policy, intervention or new health technology
- To do this, we need estimates for h_i across these policies and social preferences relating to equity-efficiency trade-offs
- Through this, we can make informed policies decisions which improve social welfare.

Overview

- *Health Production Possibility Frontiers* can be used to model the distribution of health and understand its determinants
- This often reveals *difficult equity-efficiency trade-offs* in policy choice
- The *equity impact plane* allows us to visualise and communicate those equity-efficiency trade-offs
- *Social welfare functions* can be used to rank alternative policies for alternative preferences over equity and efficiency.

Concluding Remark

- Preferences relating to equity-efficiency trade-offs may differ between people and between context
- This is why you participated in a survey before these lectures
- The survey aims to elicit the equity-efficiency trade-offs you were willing to make and the preferences you hold
- The survey and (anonymised) results from that survey will be discussed in the lecture and in exercise classes

References and Extended Reading

- Culyer, A. J., & A. Wagstaff, (1993), Equity and equality in health and health care. *Journal of Health Economics*, 12(4), 431-457.
- Cookson, R., A. Mirelman, S. Griffin, M. Asaria, B. Dawkins, O. Norheim, S. Verguet and A.J. Culyer, (2017), Using cost-effectiveness analysis to address health equity concerns. *Value in Health*, 20(2), pp.206-212.
- Atkinson, A. B., (1970), On the measurement of inequality. *Journal of Economic Theory*, 2(3), 244-263.
- Robson, M., M. Asaria, R. Cookson, A. Tsuchiya, & S. Ali, (2017), Eliciting the level of health inequality aversion in England. *Health Economics*, 26(10), 1328-1334.