

Does income affect health?

Does health cause income?

Relative income and health.

Concavity effect.

# Income and Health II:

## Absolute income, relative income, and health

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# Does personal income affect health?

Income and health  
II

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- ▶ Recall: we know income and health are positively correlated: people with higher incomes are, on average, healthier people.
- ▶ Recall: there are three (non-exclusive) reasons we might see such a correlations:
  - ▶ Higher income causes higher health.
  - ▶ Higher health causes higher income.
  - ▶ “Third variables” cause both health and income. e.g. more education may lead to both better health and higher income.

# Does personal income cause health?

Income and health  
II

Does income affect health?

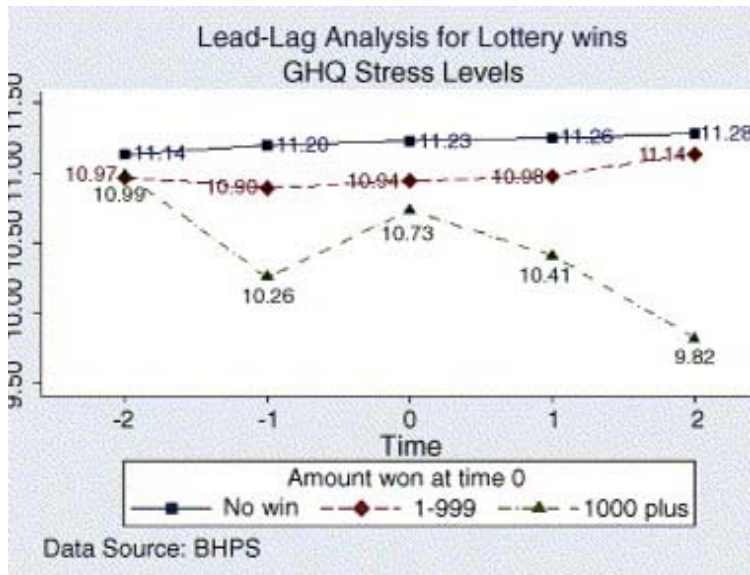
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- ▶ Yes.
- ▶ How do we know?
- ▶ Statistical methods can be used to try to hold constant “third variables.”
- ▶ When we see income change for reasons unrelated to health or third variables, health increases.

Figure: Source: Gardner and Oswald, J Health Economics, 2007



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# Personal income as a cause of health cont.

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- ▶ e.g.: people who get unexpected inheritances, or who win lotteries, or who lived in East rather than West Germany following reunification, tend to become relatively healthier than others.
- ▶ The effect of income on health is typically estimated to be positive, but small, so it does not explain most of the correlation.

# Does health cause income?

Does income affect health?

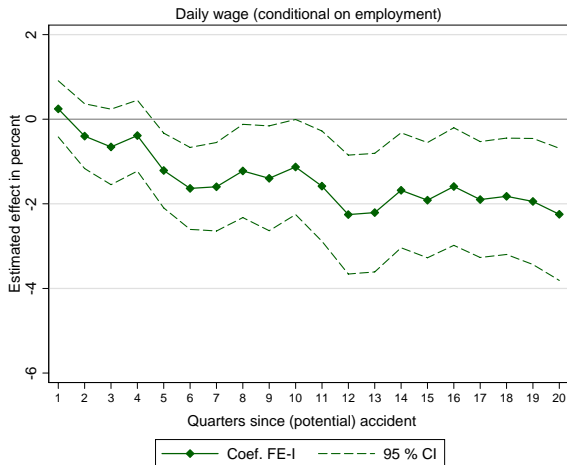
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- ▶ Yes.
- ▶ Lower health causes lower productivity, fewer hours of labor, and lower probability of employment, all of which imply lower income.
- ▶ How do we know?
- ▶ Income falls, on average, after essentially random negative shocks to health (e.g., traffic accidents)

Figure: Source: Halla and Zweimuller, 2011



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# Relative income and health.

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- ▶ We now know your income affects your health (and vice versa).
- ▶ What about your *relative* income?
- ▶ e.g. one definition:  
$$\text{relative income} = (\text{your income}) - (\text{average income in Canada})$$
- ▶ “social determinants of health.”



# Relative income and health cont.

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- ▶ Other people's incomes may affect your health, holding your income constant.
- ▶ More income inequality may affect population health because of stress.
- ▶ People (and primates) low in social hierarchy tend to experience more stress, and more stress causes lower health.
- ▶ We know that more unequal societies tend to less healthy societies (warning! this is a *correlation*).

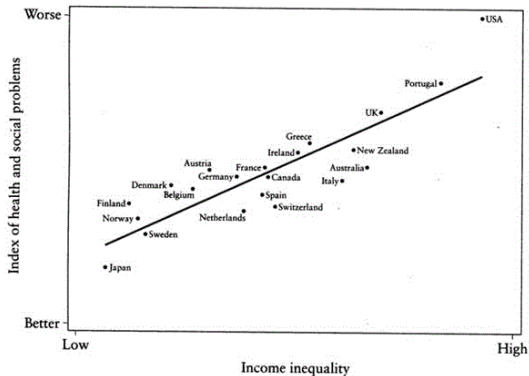


Figure 2.2 *Health and social problems are closely related to inequality among rich countries.*

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- ▶ We have to be careful: the correlation between inequality and health does not necessarily mean inequality causes low health.
- ▶ e.g.: bad institutions and policies may lead to both more inequality and low health.

# The concavity effect.

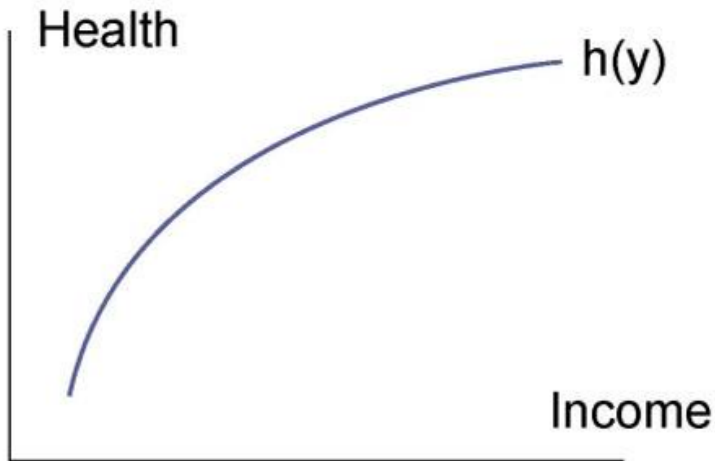
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- ▶ Suppose personal income causes health, but the marginal effect of more income on health falls with income.
- ▶ (ie, health is “concave” in income).
- ▶ Then, holding average income constant, average health will be lower in more unequal societies.



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# Example.

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- ▶ Let  $H$  denote health and  $Y$  denote income, and suppose:  $H = \sqrt{Y}$ .
- ▶ In society A, 1/2 the pop has  $Y = 0$  and the other half  $Y = 25$ .
- ▶ In society B, 1/2 the pop has  $Y = 9$  and the other half  $Y = 16$ .
- ▶ Average income in both these societies is 12.5
- ▶ Average health in A:  $0.5\sqrt{0} + 0.5\sqrt{25} = 2.5$ .
- ▶ Average health in B:  $0.5\sqrt{9} + 0.5\sqrt{16} = 3.5$ .

# Evidence.

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- ▶ This is an area of intensive ongoing research.
- ▶ The data are quite bad and the statistical challenges are formidable.
- ▶ Much of the evidence suggests that most but not all of the correlation we see across countries between inequality and health is attributable to the concavity effect.
- ▶ Personal income seems to matter more than relative income.

# Policy implications.

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- ▶ Even if only personal and not relative income matters, more income redistribution implies higher average health.
- ▶ (so long as distribution does not destroy too much income).
- ▶ Why? Again, concavity effect implies taking a dollar from a rich person harms her health less than one more dollar to a poor person increases her health.
- ▶ Income redistribution may more effectively increase average health if relative income does matter.



## Further reading.

Leigh, A., C. Jencks, and T. Smeeding (2009) "Health and economic inequality," in *Oxford Handbook of Economic Inequality*.

<http://andrewleigh.org/pdf/HealthInequalityOUP.pdf>