

Genetic Testing and Health Insurance Markets

David Bardey

University of Los Andes (Bogotá) - Toulouse School of Economics

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Genetic testing revolution

- Geneticists reveal that the ongoing improvements will generate several consequences in the next years:
 - Lower costs: genetic tests will become cheaper.
 - Personalized medicine:
 - Curative;
 - Secondary and primary prevention.
- Geneticists seem to work faster than economists!!!

Goal of this presentation

1. Give a brief overview of several economic results.
2. Point out some opened issues generated by the ongoing revolution:
 1. Family background and genetic testing;
 2. Lower cost and higher proportion of informed policyholders.

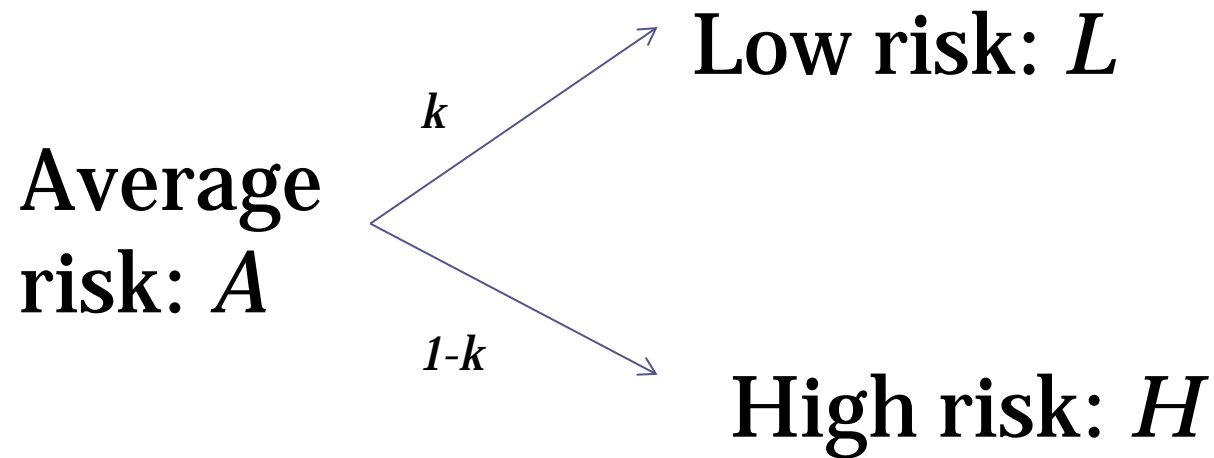
A brief overview

- 1. Genetic testing and information value**
- 2. Different effects according to different regulations at stake**

Genetic testing and information value

- First, assume that people cannot modify their risk.
 - In such a case, risk theory reveals that the information value is negative (Hirshleifer, 1971).
 - **Corollary:** When nothing can be done, genetic testing can reduce individuals' welfare.
- Happiness behind the veil of ignorance!

Genetic testing and information value



Genetic testing and information value

- Before taking the test, most people believe that they are characterized by average risk (A).
- After testing, they know if they are high (H) or low risk (L).
- By definition: $A = kL + (1-k)H$.
- Risk aversion ($U(.)$ increasing and concave function) implies:

$$U(A) > kU(L) + (1-k)U(H).$$

Genetic testing and information value

- Additionally to the psychological cost, if people pay insurance premium according to their level of risk, they are worse off.
- It may depend on the regulation at work.

Genetic testing, prevention and information value

- Nevertheless... the better knowledge of their risk allows individuals to adjust their prevention behavior.
- Common saying: “*genes load the gun, and environment pulls the trigger*”.
- Some preventive actions can be too costly for average risk but very useful and necessary for high risk.
- On the contrary, some preventive actions can be costly and useless for “healthy people” while non-tested individuals could be willing to make a test.
- In both cases, and from a medical perspective: genetic testing information is valuable.

Genetic testing, prevention and information value

- In Bardey and De Donder (JHE, 2013) a set-up is provided to include medical and economic perspectives together:
 - Information value of genetic testing depends:
 - on prevention efficiency (increasingly);
 - on prevention cost (non-monotonic relation).
 - Separate, tailored tests, better for welfare than generic, all encompassing test (such as full genome).

Information asymmetry and regulations

- Health insurance markets known to be exposed to market failure generated by information asymmetry (adverse selection).
 - Genetic testing may reinforce such a market failure.
 - **Moreover**, genetic testing generates **risk discrimination**.
- Trade-off *ex ante* / *ex post* efficiency.
- **Fake debate**: To protect policyholders *versus* insurers!

Information asymmetry and regulations

- ***Laissez faire***: Insurers can ask the test to policyholders (Australia, Canada, China, Japan, Korea, Ireland, Portugal, Russia, Singapore, Spain and South Africa).
- **Disclosure duty**: consumers have to disclose the results of existing tests, at the insurers' request, but cannot be required to take additional tests (Germany, New Zealand, and the UK).
- **Consent law**: consumers are not required to divulge genetic tests results. If they do, insurers may use this information (the Netherlands, Switzerland).
- **Strict prohibition**: insurers cannot request genetic tests, cannot require applicant to provide existing tests results, and cannot use any genetic information in underwriting and rating (Austria, Belgium, Denmark, France, Israel, Italy and Norway).

Information asymmetry and regulations

- One way to get rid of adverse selection → ***Laissez faire*** or **disclosure duty** (UK, New Zealand).
- **However**, in such a case, risk discrimination is full!
- In case of **strict prohibition**, risk discrimination is smoothed but adverse selection at stake.
- Results from Barigozzi and Henriët (2010), Crainich (2013) *etc.* show that policyholders are better off under disclosure duty.
- **Ideal world**: to have an insurance market against genetic test results (Tabarrok, 1994) → Unrealistic!

Two opened questions



Genetic testing and family background

- **Bipolar regulations!**
- Genetic tests seem to be over-regulated.
- Family background may provide rich information and such an information is taken into account in health insurance contract.
- **Interplay between both dimensions:** people with complicated family background maybe more willing to be tested.

Lower cost of genetic tests

- Genetic tests will become always cheaper and with sizeable welfare gains due to personalized medicine.
- One may expect that the proportion of tested policyholders will increase.
- This increasing proportion will crucially modify the health insurance equilibrium.

Lower cost of genetic tests

- Until now, one individual tested positive may expect to hide the result of the test.
- When the proportion will be large enough, an individual who will not show the test result will be automatically suspected!
- Change in the health insurance market equilibrium.

Thank you!

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