

# 27th International Congress of Actuaries



## In pact of genetics on life & health products A few practical examples

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22.03.2002

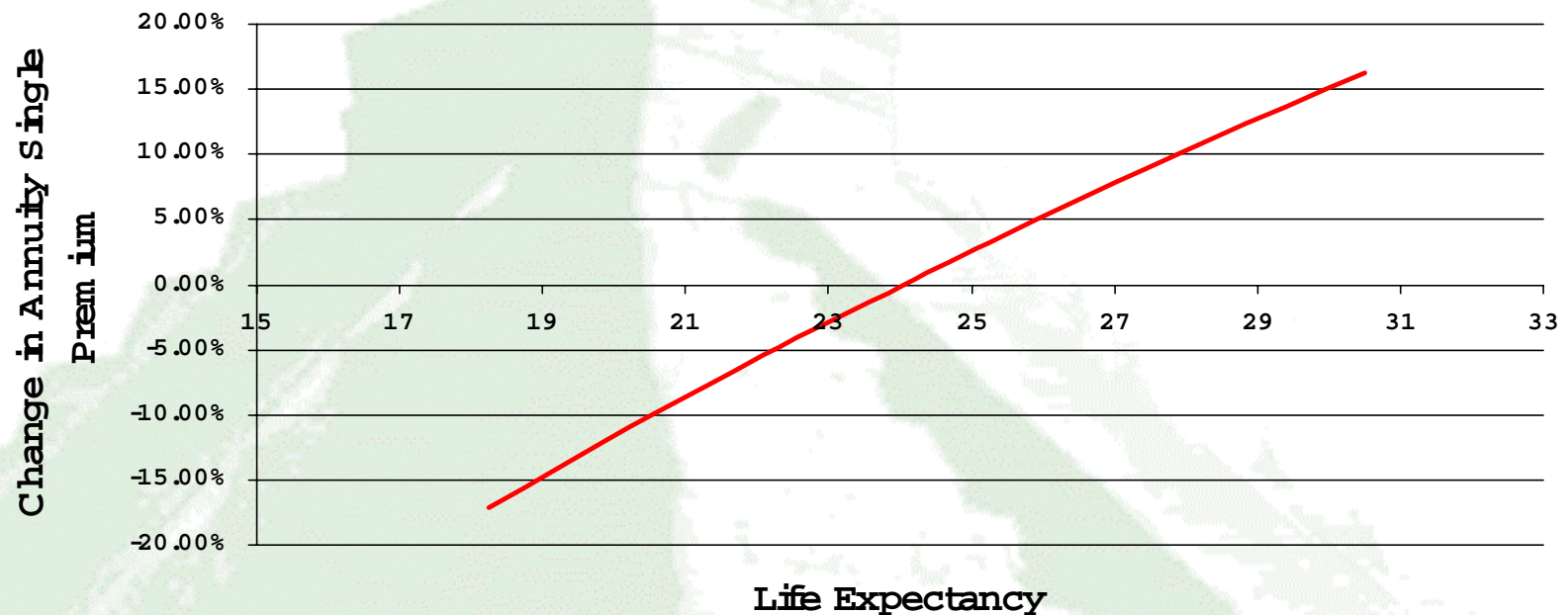
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# Trends

- Advances in predictive medicine, and in particular in genetics, increase private knowledge
- Enactment of Privacy and Data Protection laws
- Emergence of an entitlement philosophy
- Constraints on the insurers' right to underwrite and ability to design products and price them actuarially
- Opportunities for the applicants to select against insurers (product, amount) and to abuse the system in complete legality.

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# Impact on pricing - Annuities



Swiss male aged 60; expected mortality: 100% ERM 90

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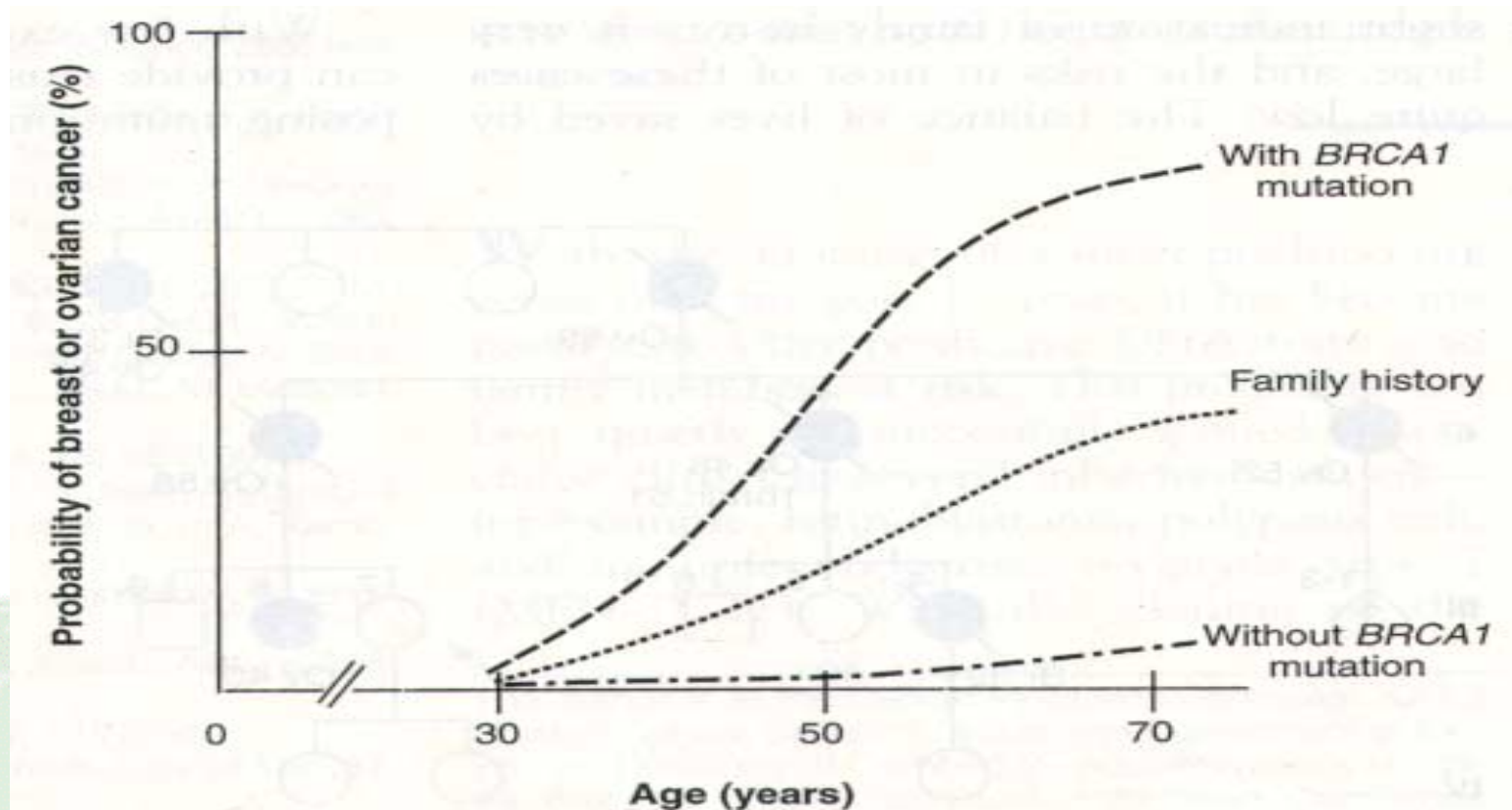
## In pact on pricing – Annuities

		Group's mortality ratio (%)	Distribution of groups in 4 portfolios (%)			
Group	#					
	1	200	7.5			
	2	150	17.5			
	3	100	30.0	40.0		
	4	75	25.0	33.3	55.6	
	5	50	20.0	26.7	44.4	100
Live expectancy at 60			24.93	26.62	28.35	30.49
Single premium (SP) at 60			17.55	18.36	19.12	20.01
$\Delta$ SP				4.6 %	8.9 %	14.0%

Swiss male aged 60; expected mortality: ERM 90

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# Impact on pricing - Critical Illness



Source: Science, vol278(7), 1997, B. Ponder

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# Impact of genetics on pricing and product design

Taking into account the development of predictive medicine, and in particular of genetics, can insurers afford **guarantees** (premiums and benefits) ?

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# Impact on pricing - Critical Illness

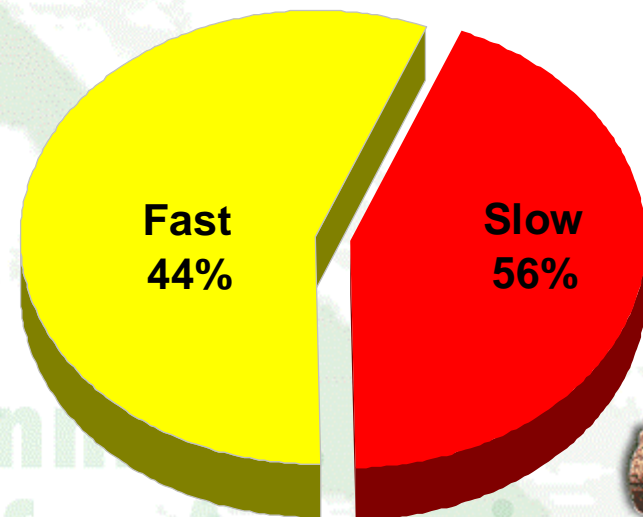
Breast cancer: genetic susceptibility to cigarette smoke

1

- N-acetyltransferase 2

- Inactivator of aromatic and heterocyclic amines  
Activator of N-hydroxy metabolites
- Encoded by the polymorphic *NAT2* gene

- Population distribution



Source: Dr. Michael Morris, HCU, Geneva

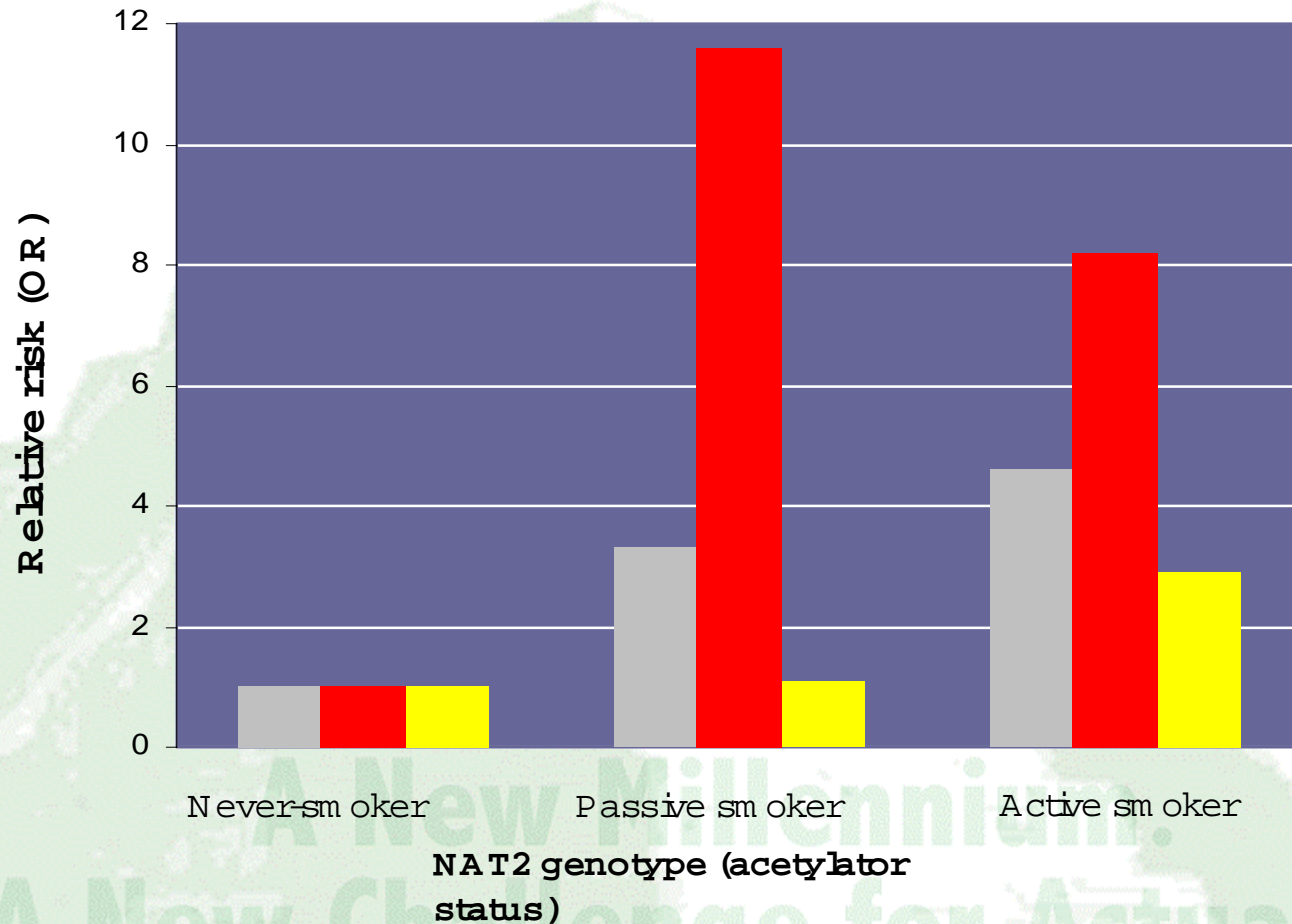
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# Impact on pricing - Critical Illness

Breast cancer: genetic susceptibility to cigarette smoke

2

Post-menopausal breast cancer, case-control study (n=177-170); Never-exposed vs. Passive vs. Active



Morabia, Bernstein,  
Kurtz, Bouchardy, Morris;  
*Amer J Epidemiol*  
152:226-32, 2000.



# Impact of genetics on life & health products

- Problems are too complex and too prone to change to warrant adopting legal regulations
- The measures to be taken relate more to a **Code of Conduct** agreed upon by all stakeholders, including the patients' organizations, with the view to **avoid abuse on the part of both the insurers and the policyholders.**

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