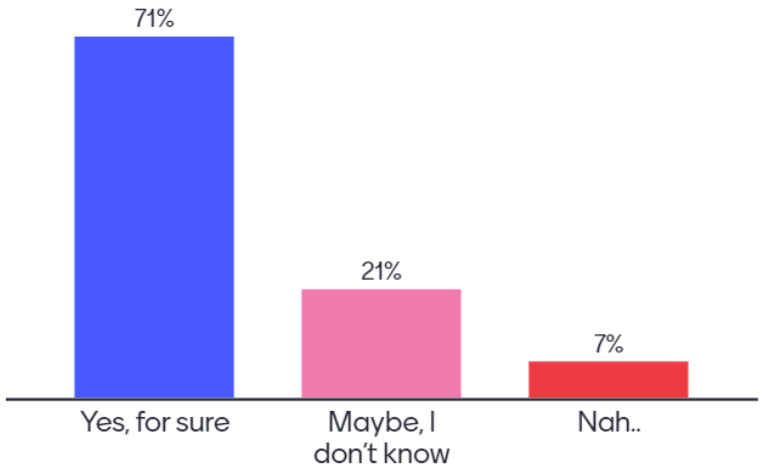
AN ACTUARY IN PUBLIC HEALTH

Josephine Robertson MA FIA CERA MPH

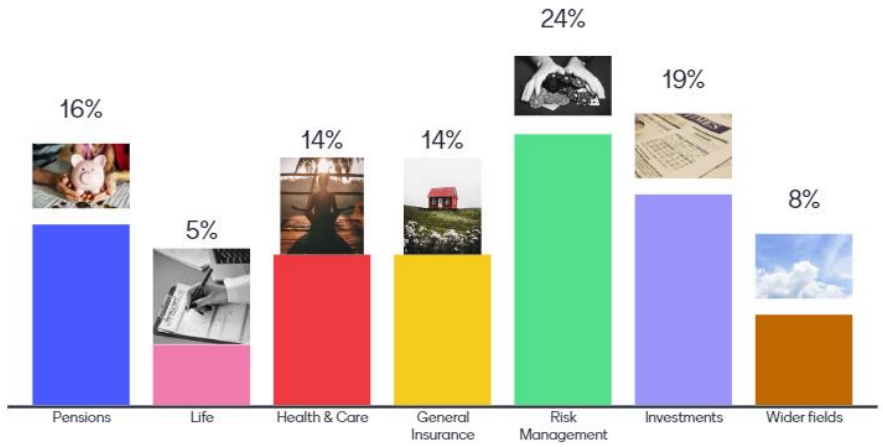
24 October 2023

Queen Mary University

Who wants to be an actuary?



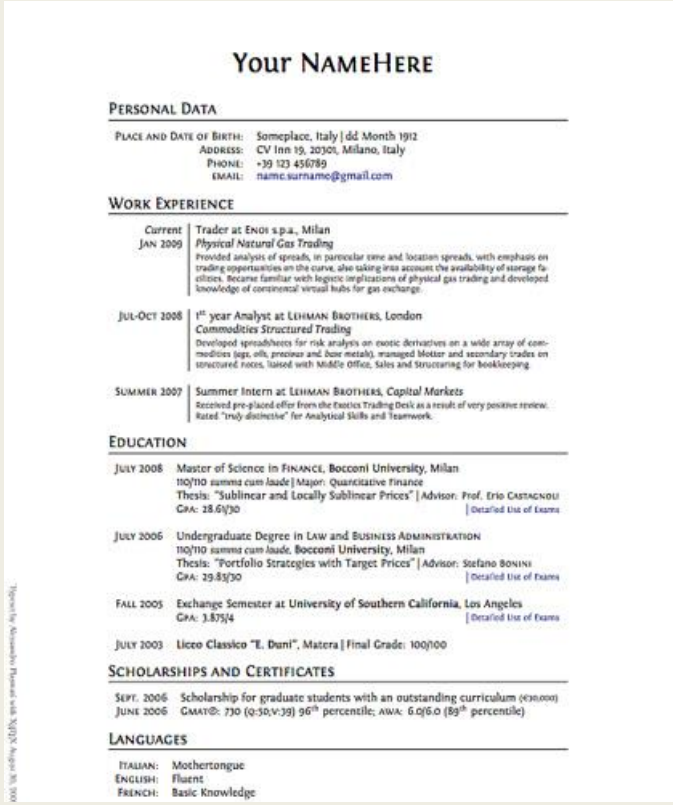
What area do you want to work in?



SOME INITIAL QUESTION FOR YOU

Intro and Background

- Education
- Career
- Extra-curricular
- Aims and Interests



Your NameHere

Personal Data

Place and Date of Birth: Someplace, Italy | dd Month 1912
Address: CV Inn 19, 20301, Milano, Italy
Phone: +39 123 456789
Email: name.surname@gmail.com

Work Experience

Current / Jan 2009 | Trader at Enoi s.p.a., Milan
Physical Natural Gas Trading
Provided analysis of spreads, in particular time and location spreads, with emphasis on trading opportunities on the curve, also taking into account the availability of storage facilities. Became familiar with logistic implications of physical gas trading and developed knowledge of continental virtual hubs for gas exchange.

Jul-Oct 2008 | 1st year Analyst at Lehman Brothers, London
Commodities Structured Trading
Developed spreadsheets for risk analysis on exotic derivatives on a wide array of commodities (gas, oils, precious and base metals), managed blotter and secondary trades on structured notes, liaised with Middle Office, Sales and Structuring for bookkeeping.

Summer 2007 | Summer Intern at Lehman Brothers, *Capital Markets*
Received pre-placed offer from the Exotics Trading Desk as a result of very positive review. Rated "truly distinctive" for Analytical Skills and Teamwork.

Education

July 2008 | Master of Science in Finance, **Bocconi University**, Milan
110/110 *summa cum laude* | Major: Quantitative Finance
Thesis: "Sublinear and Locally Sublinear Prices" | Advisor: Prof. Erio Castagnoli
GPA: 28.61/30 | Detailed List of Exams

July 2006 | Undergraduate Degree in Law and Business Administration
110/110 *summa cum laude*, **Bocconi University**, Milan
Thesis: "Portfolio Strategies with Target Prices" | Advisor: Stefano Bonini
GPA: 29.83/30 | Detailed List of Exams

Fall 2005 | Exchange Semester at **University of Southern California**, Los Angeles
GPA: 3.875/4 | Detailed List of Exams

July 2003 | **Liceo Classico "E. Duni"**, Matera | Final Grade: 100/100

Scholarships and Certificates

Sept. 2006 | Scholarship for graduate students with an outstanding curriculum (€30,000)
June 2006 | GMAT©: 730 (Q:50,V:39) 96th percentile; AWA: 6.0/6.0 (89th percentile)

Languages

Italian: Mothertongue
English: Fluent
French: Basic Knowledge

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AN ACTUARY IN PUBLIC HEALTH

Complementary: actuarial and public health skills

Quantitative Analysis

- Statistics
- Modelling
- Coding

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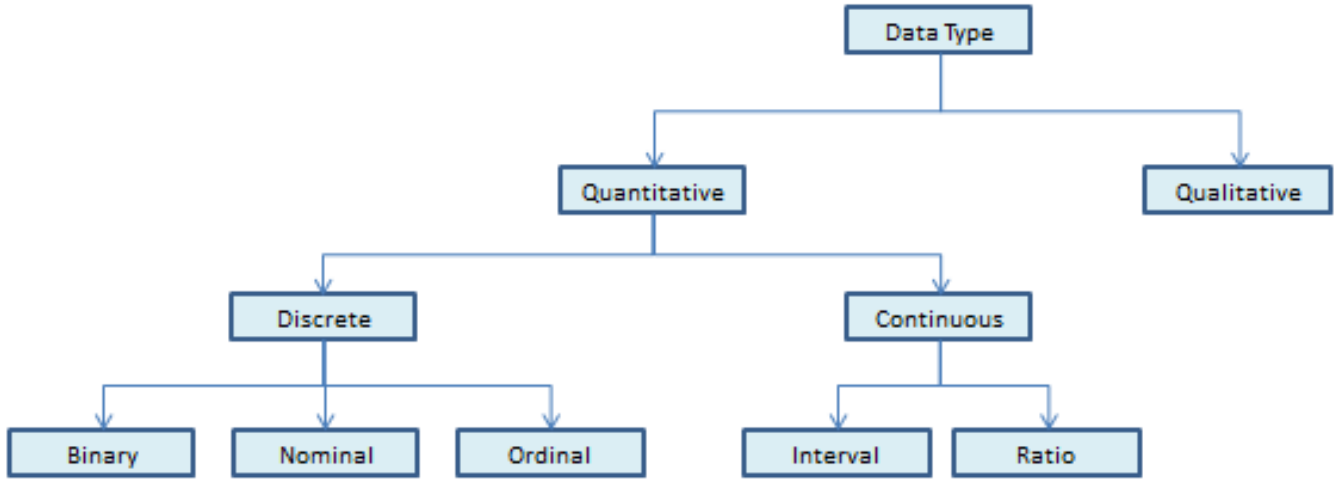
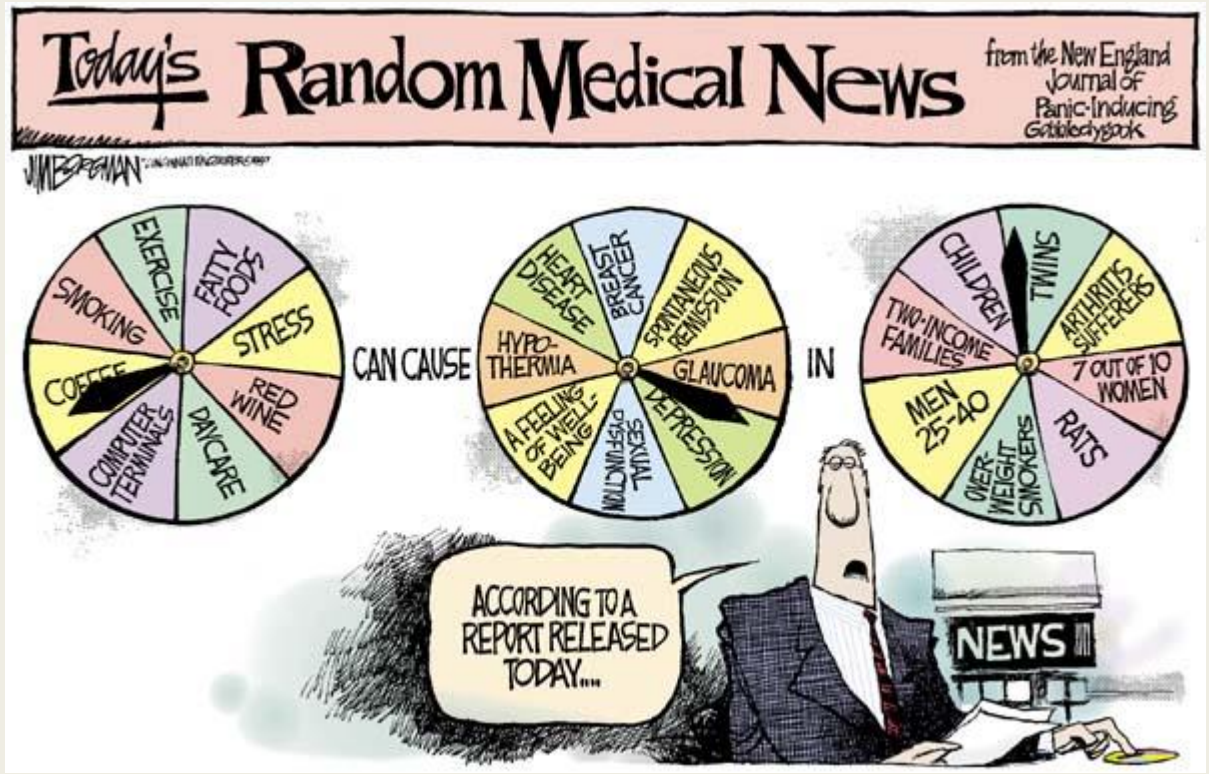


Quantitative Analysis

- Epidemiology



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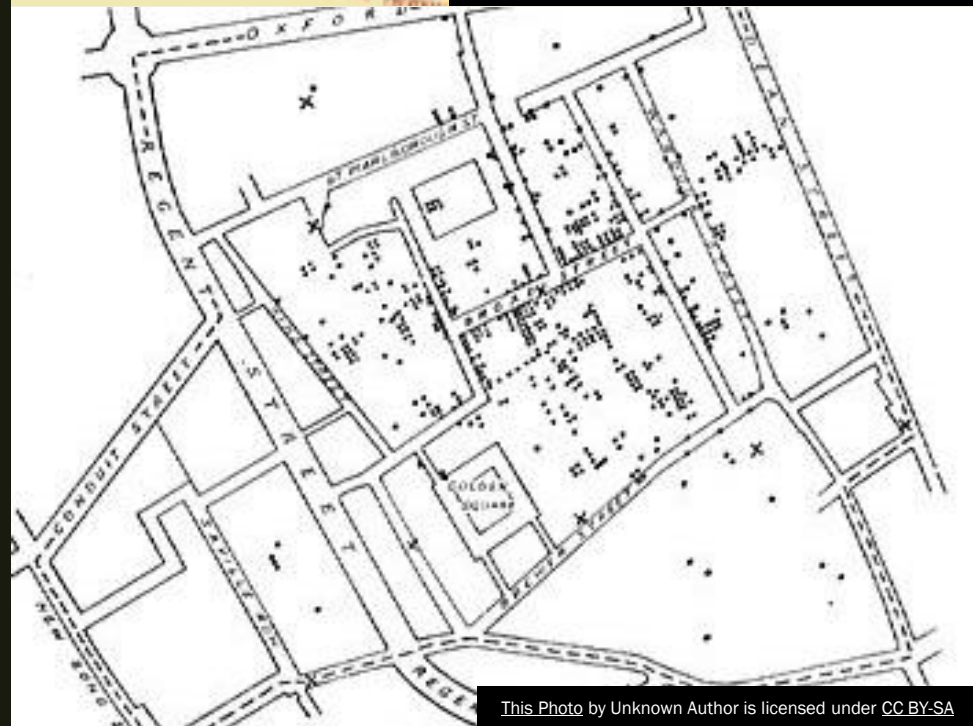

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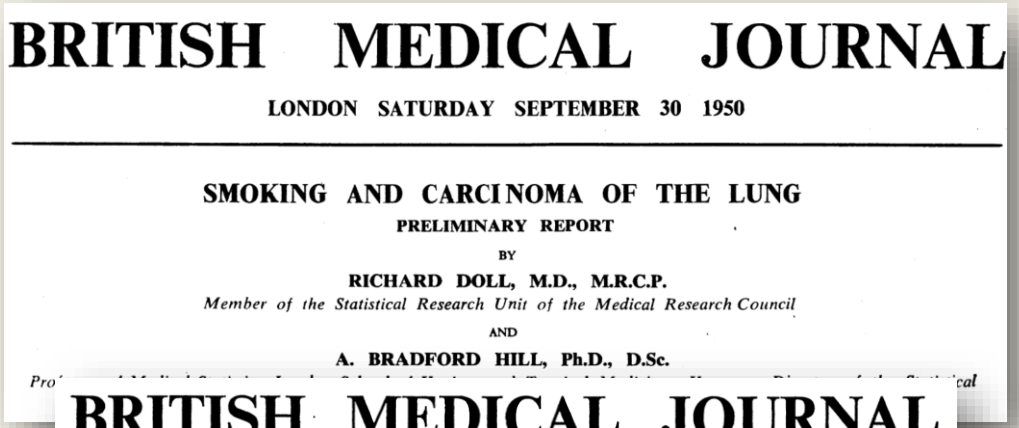
Epi case study: Smoking & the Bradford Hill Criteria



BRITISH MEDICAL JOURNAL

LONDON SATURDAY SEPTEMBER 30 1950

SMOKING AND CARCINOMA OF THE LUNG

PRELIMINARY REPORT

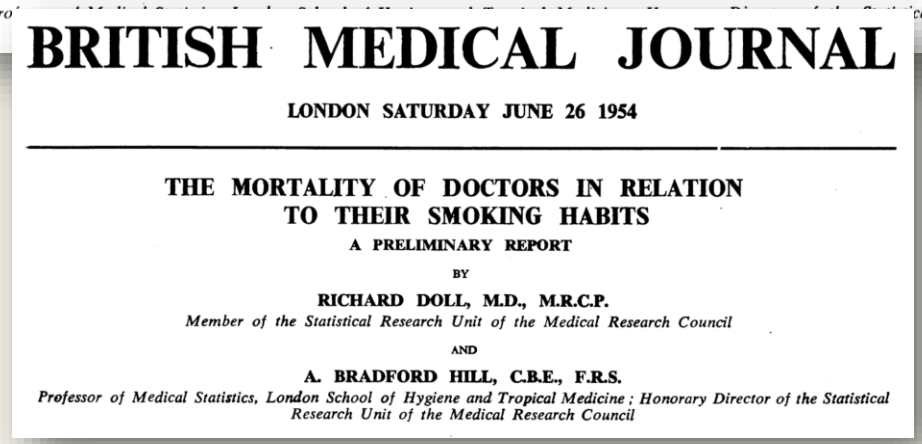
BY

RICHARD DOLL, M.D., M.R.C.P.

Member of the Statistical Research Unit of the Medical Research Council

AND

A. BRADFORD HILL, Ph.D., D.Sc.



BRITISH MEDICAL JOURNAL

LONDON SATURDAY JUNE 26 1954

THE MORTALITY OF DOCTORS IN RELATION TO THEIR SMOKING HABITS

A PRELIMINARY REPORT

BY

RICHARD DOLL, M.D., M.R.C.P.

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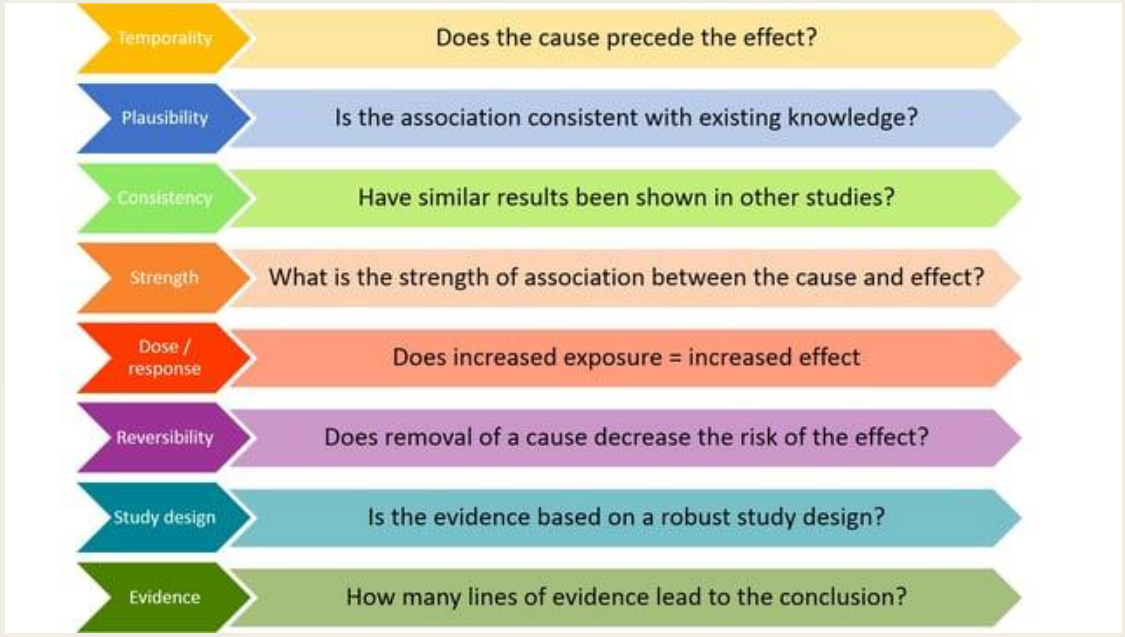
Professor of Medical Statistics, London School of Hygiene and Tropical Medicine; Honorary Director of the Statistical Research Unit of the Medical Research Council

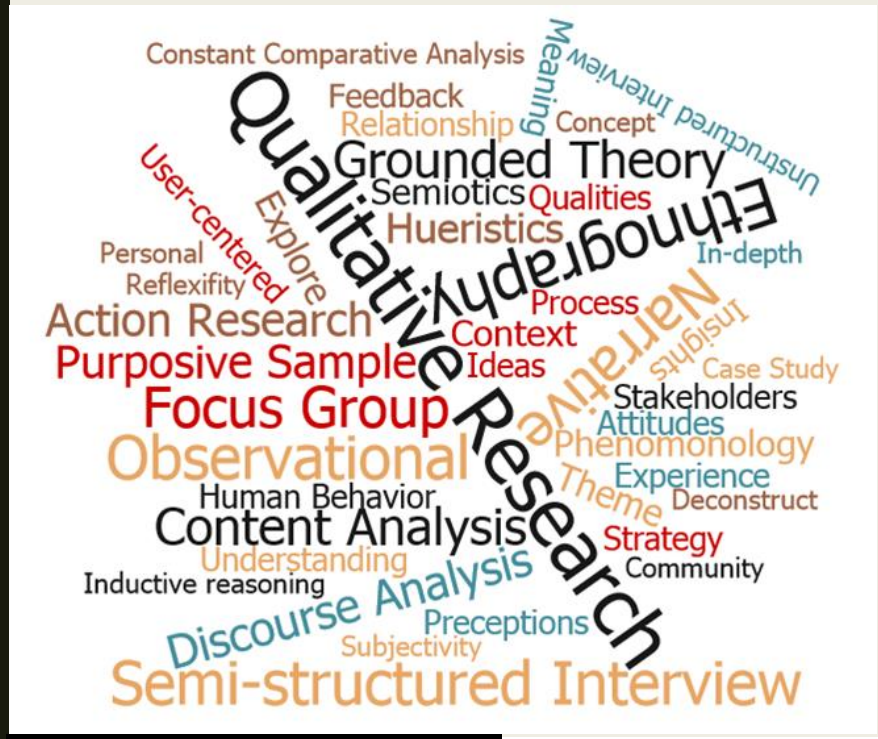


https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2038856/

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2085438/pdf/brmedj03396-0011.pdf

Qualitative Analysis

- What do you think about qualitative research?



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Qualitative research

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- Why might it be useful?

Qualitative research

Underwriting

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Results bias

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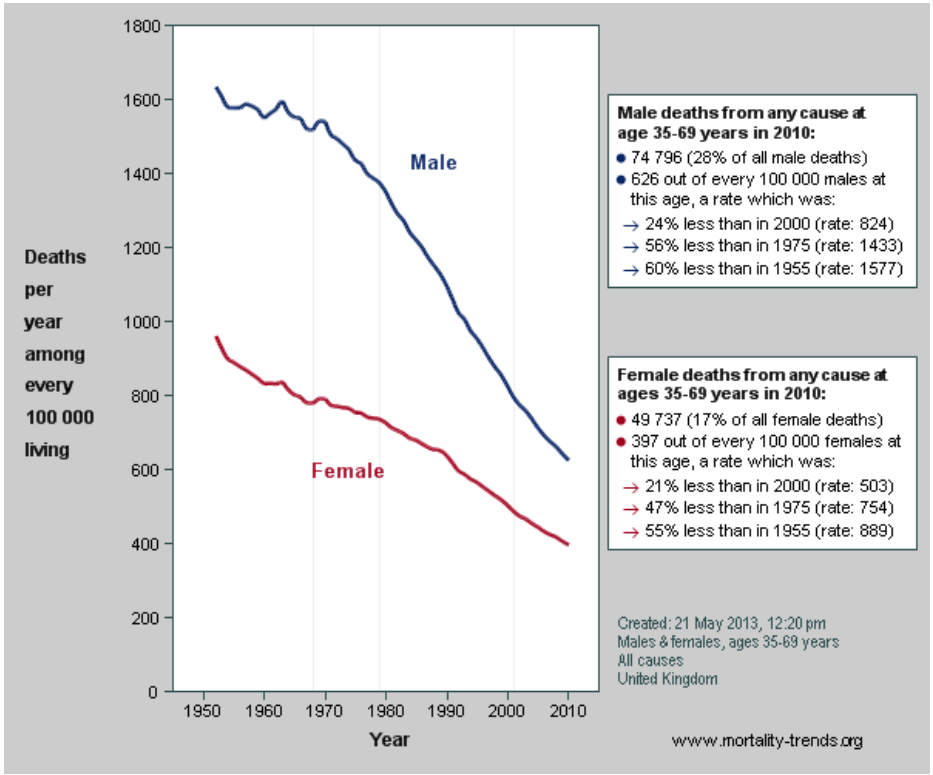
Health promotion & The health care systems

- From rear view to forward looking
- What's coming next
- The importance of law, policy, funding, and much more


Deaths per year among every 100 000 living
1800
1600
1400
1200
1000
800
600
400
200
0
1950
1960
1970
1980
1990
2000
2010
Year
Male
Female
Male deaths from any cause at age 35-69 years in 2010:
74 796 (28% of all male deaths)
626 out of every 100 000 males at this age, a rate which was:
→ 24% less than in 2000 (rate: 824)
→ 56% less than in 1975 (rate: 1433)
→ 60% less than in 1955 (rate: 1577)
Female deaths from any cause at ages 35-69 years in 2010:
49 737 (17% of all female deaths)
397 out of every 100 000 females at this age, a rate which was:
→ 21% less than in 2000 (rate: 503)
→ 47% less than in 1975 (rate: 754)
→ 55% less than in 1955 (rate: 889)
Created: 21 May 2013, 12:20 pm
Males & females, ages 35-69 years
All causes
United Kingdom
www.mortality-trends.org

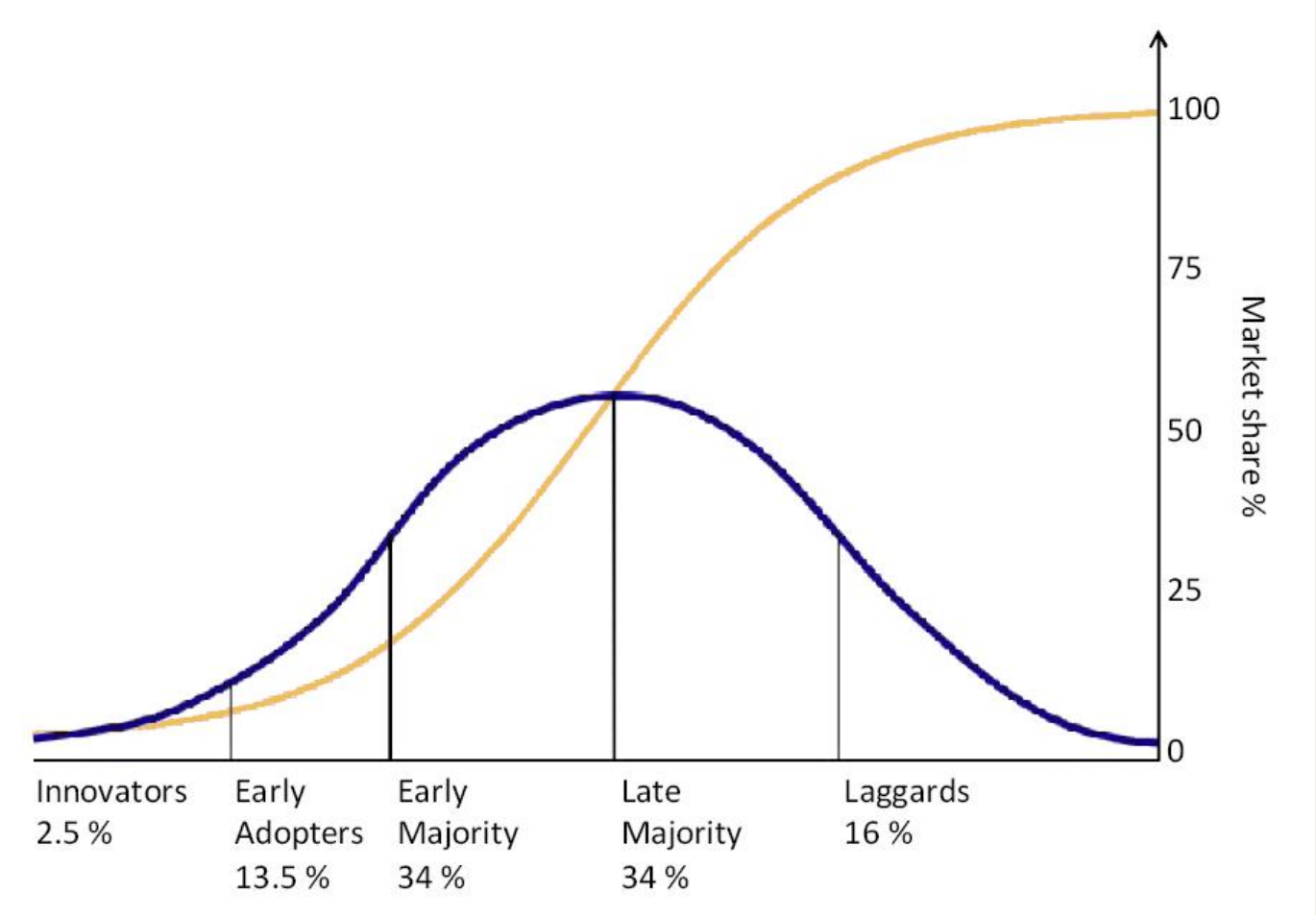
Then...

Winston
TASTE ISN'T THE ONLY REASON I SMOKE
"People are always telling me that smoking causes low birth weight. Talk about a win-win-win! An easy labor, a slim baby, and the Full Flavor of Winstons!"
Winston
when you're smoking for two
SURGEON GENERAL'S WARNING: Smoking

Now...

Smoki
your a
Get help to stop sm
Tobacco smoke contains over 70 substances known to cause cancer
Smoking kills - quit now
NHS
EVERY SINGLE CIGARETTE HARMS YOUR BABY.
SMOKEFREE

Diffusion Theory



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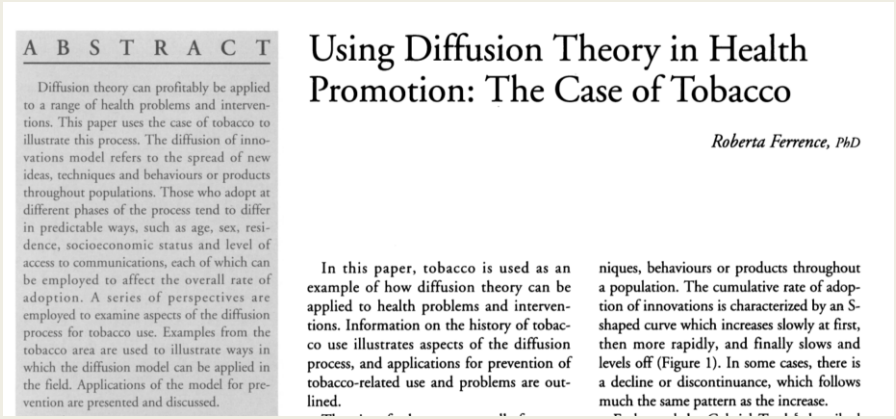
- Prevention
- Intervention



ABSTRACT

Diffusion theory can profitably be applied to a range of health problems and interventions. This paper uses the case of tobacco to illustrate this process. The diffusion of innovations model refers to the spread of new ideas, techniques and behaviours or products throughout populations. Those who adopt at different phases of the process tend to differ in predictable ways, such as age, sex, residence, socioeconomic status and level of access to communications, each of which can be employed to affect the overall rate of adoption. A series of perspectives are employed to examine aspects of the diffusion process for tobacco use. Examples from the tobacco area are used to illustrate ways in which the diffusion model can be applied in the field. Applications of the model for prevention are presented and discussed.

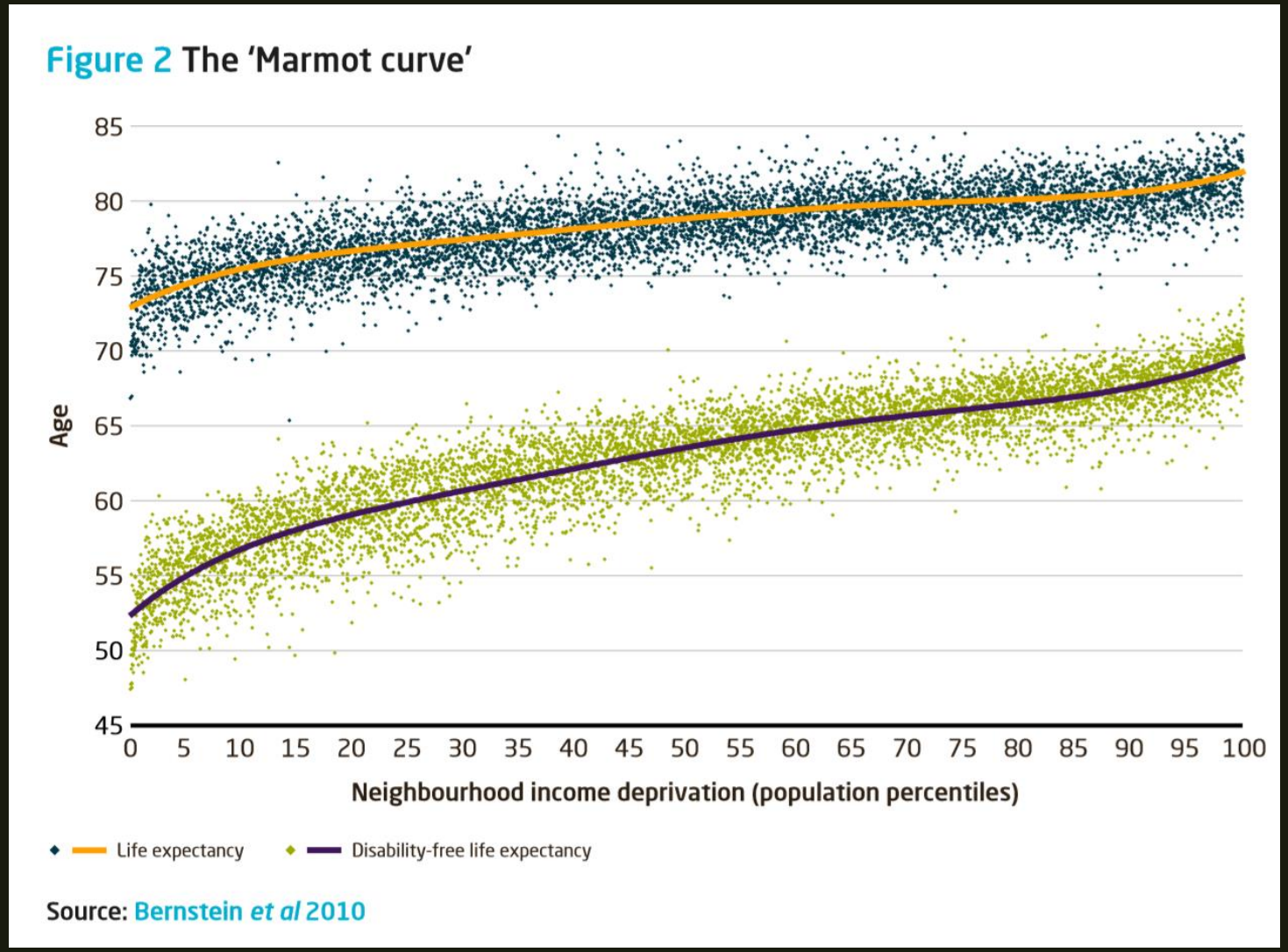
Using Diffusion Theory in Health Promotion: The Case of Tobacco

Roberta Ferrence, PhD

In this paper, tobacco is used as an example of how diffusion theory can be applied to health problems and interventions. Information on the history of tobacco use illustrates aspects of the diffusion process, and applications for prevention of tobacco-related use and problems are outlined.

niques, behaviours or products throughout a population. The cumulative rate of adoption of innovations is characterized by an S-shaped curve which increases slowly at first, then more rapidly, and finally slows and levels off (Figure 1). In some cases, there is a decline or discontinuance, which follows much the same pattern as the increase.

Ferrence, R., 1996. Using diffusion theory in health promotion: the case of tobacco. *Canadian journal of public health = Revue canadienne de sante publique*, 87 Suppl 2, pp.S24–7.

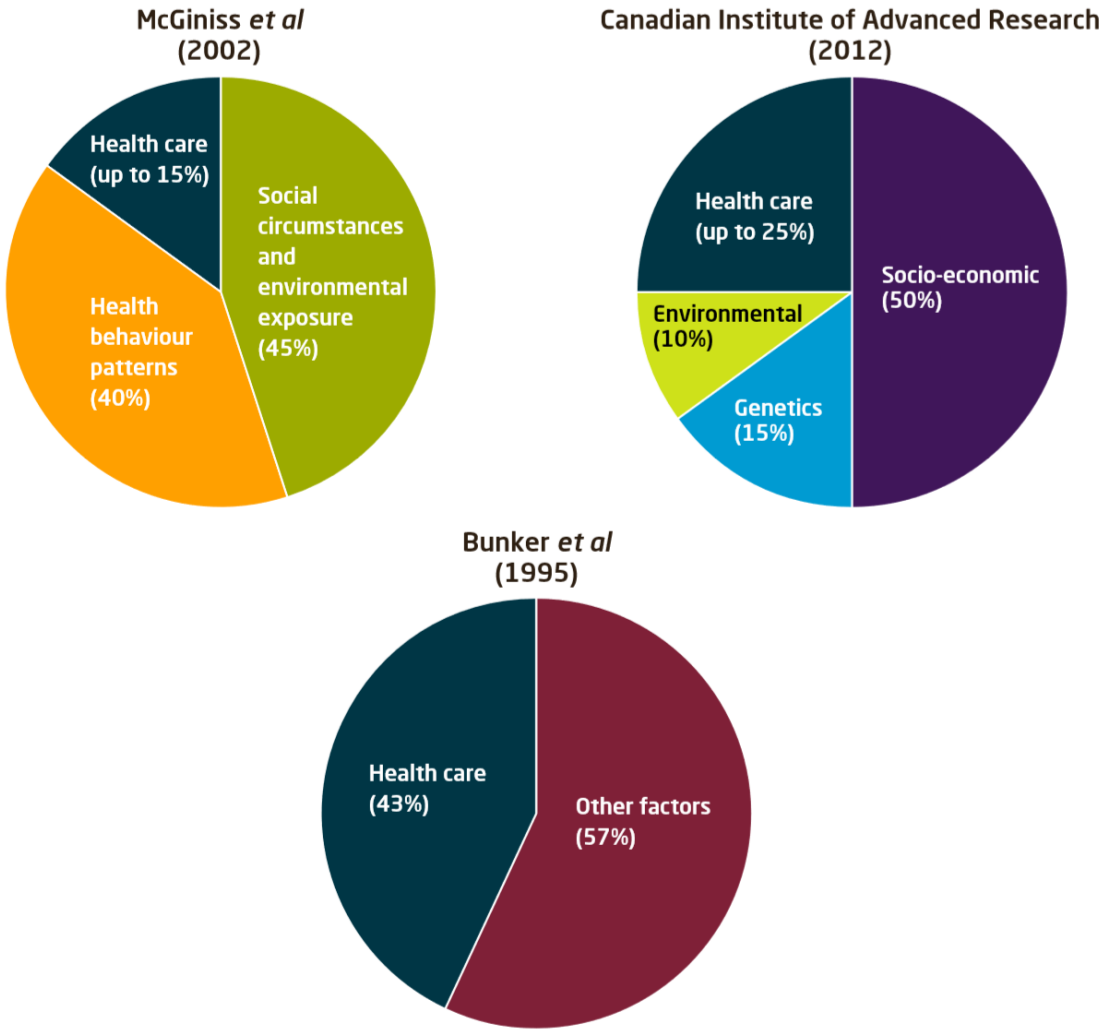


https://www.kingsfund.org.uk/sites/default/files/field/field_publication_file/inequalities-in-life-expectancy-kings-fund-aug15.pdf

Inequalities

- Morbidity
- Life expectancy
- Access to care

Figure 1 Estimates of the relative contribution of factors to our health



Source: The King's Fund 2013

https://www.kingsfund.org.uk/sites/default/files/field/field_publication_file/inequalities-in-life-expectancy-kings-fund-aug15.pdf

Ethics

- Is it fair to price on smoking status?
- Is it fair to price on weight?
- Is it fair to price on postcode?

Why get an actuary in your team?

Technical skills

Professional skills

https://www.actuaries.org.uk/upholding-standards

Why do you want to be any actuary?
14 responses

QUESTIONS?