

NON-TRADITIONAL CITATION ANALYSIS FOR RESEARCH EVALUATION

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SYNOPSIS OF PRESENTATION

- **The web of health research utilisation**
- **Other types of citation and their features**
- **Seven new types of citations**
 - **patents (USPTO, EPO)**
 - **international standards**
 - **government policy documents**
 - **clinical guidelines**
 - **textbooks**
 - **newspapers**
 - **broadcast media**

THE WEB OF HEALTH RESEARCH UTILISATION – 2

- Diagram is inevitably complex – & could be more so
- Science citations only cover tiny part of whole
- Central roles of government policy and public views
- We must realise that the large majority of research will have NO immediate practical benefit
- Many of the nodes in the diagram are documents, which have references and cite to research
- The actors and activities in the diagram are mainly NATIONAL, not international

OTHER TYPES OF CITATION & THEIR FEATURES - 1

- Most will be nationally-based (or regional) and will need national data-gathering exercises
- It's desirable to use common norms and protocols in different countries so that data can be exchanged
- Evaluation data will be provided mostly on national outputs, but sometimes also on other countries
- Selection of indicators (and citing documents) must be appropriate for the type of research (cf. car)
- Most papers won't be cited in this way, so can only use to evaluate large numbers (e.g., nations)

OTHER TYPES OF CITATION & THEIR FEATURES - 2

- **Some of the new citation indicators will peak much earlier (or later) than conventional citations (2-3 yrs)**
- **Norms (except for patents) largely unknown, but national research likely to be over-cited by x 3-5**
- **Most of the citing documents are available over the Web or through libraries, but some on subscription**
- **Some citing documents (e.g., newspapers) don't have tidy lists of references and may need detective work to identify the cited research papers**

OTHER TYPES OF CITING DOCUMENTS - 1

- Patents from USPTO, EPO: many have “non-patent references” (NPRs) on front page
- International standards: e.g., from ICRP, ISO, Codex Alimentarius (set up by FAO and WHO), European Union
- Government policy documents (white papers) and underpinning discussion papers (green papers)
- Clinical guidelines: produced in many countries, by different bodies. Are they followed?

OTHER TYPES OF CITING DOCUMENTS – 2

- **Textbooks:** increasingly chapters resemble reviews with many refs to research papers. Can be for undergraduates and graduates, mostly national
- **Newspapers:** increasing interest in science, particularly health research. Widely read by policy makers, healthcare professionals, researchers and the public
- **Broadcast media:** hard to capture but some now have searchable web-sites, e.g., BBC from 1998 to present

PATENTS FROM USPTO, EPO

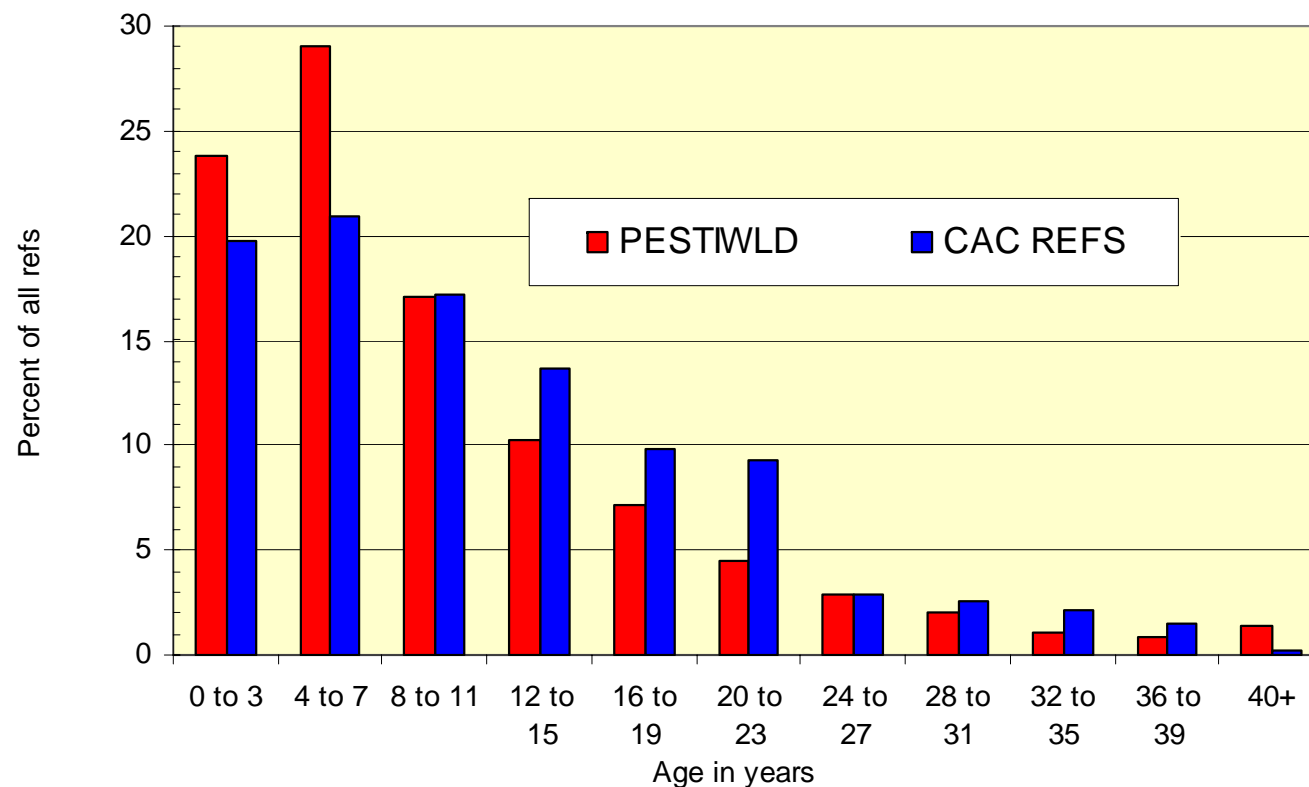
- Norms for NPRs now well established (by CHI Research Inc. (now iplQ Inc.) and others)
- Most cited papers are basic research, not applied, and in biomedical fields, not engineering
- “Technology cycle time” can be quite short
- Patents assigned to a country over-cite that country’s research (by about x 3)
- This shows the importance of a national science base to technological development

INTERNATIONAL STANDARDS - 1

- **Most of the standards are freely available on the Web, and have lists of research references, mostly journal articles**
- **Procedure for identification based on numbering references and listing by years on a sheet. They can then be sought in a database and their full bibliographic details downloaded for analysis**
- **Papers can then be looked up in libraries (or on the Web) to determine funding sources**
- **Need to compare cited papers with a norm group**

INTERNATIONAL STANDARDS – 2

Example: Codex Alimentarius standards for pesticide residues in food (work by Potenza Atiogbe): date of references

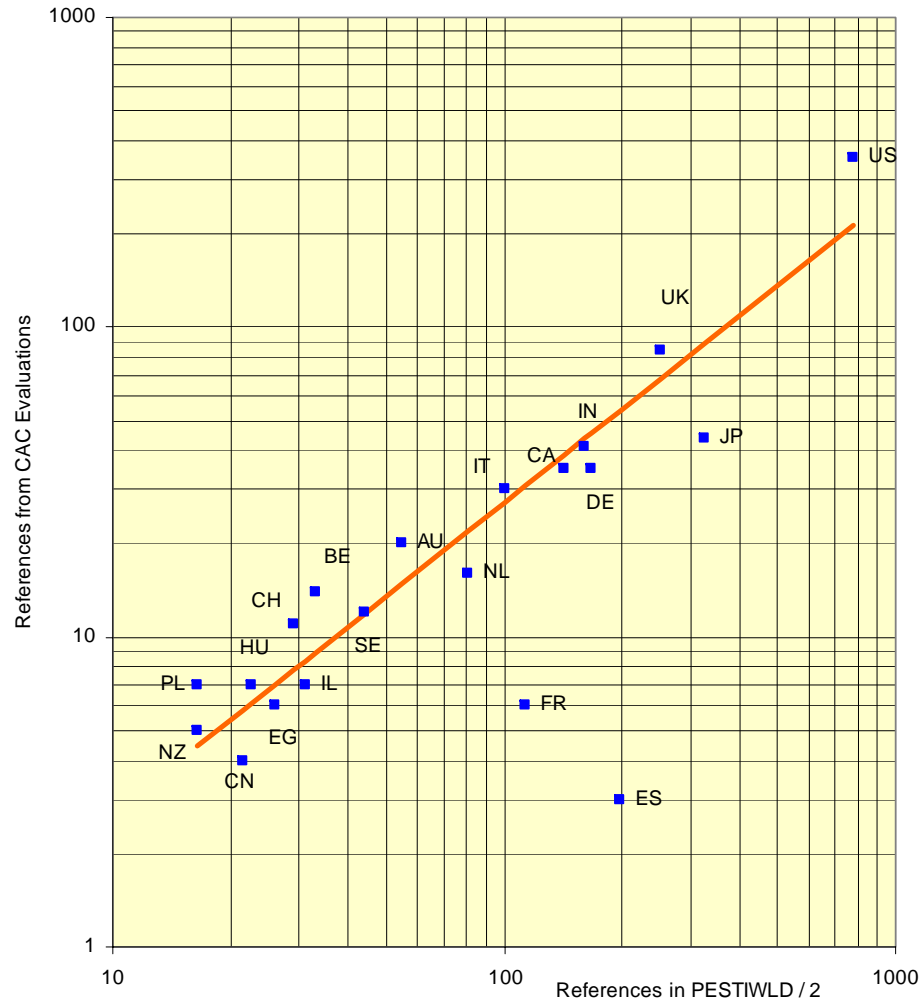


References from CAC standards are older than from norm group: is the cited science out-of-date?

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INTERNATIONAL STANDARDS – 3

Nationality of research articles cited by CAC evaluations of pesticides



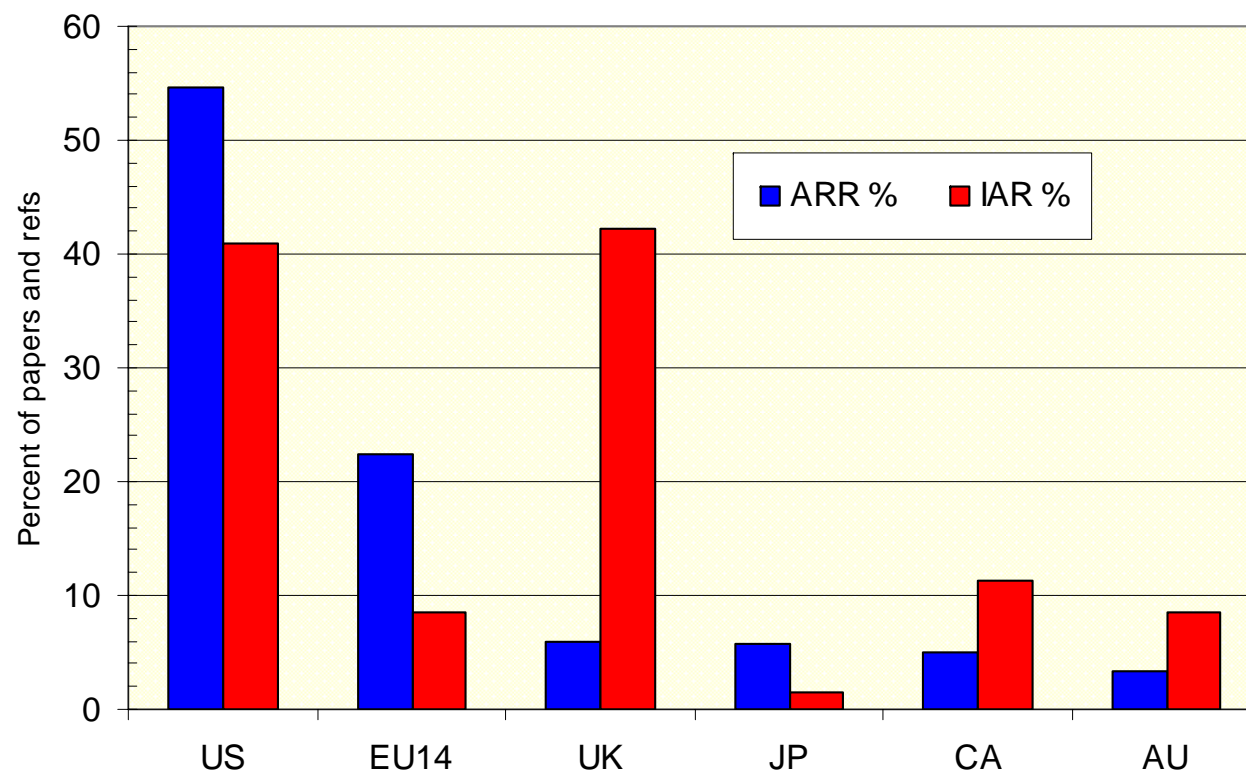
A good correlation between national distribution of CAC evaluation references and pesticide science in the SCI, except for USA (over-cited) and France and especially Spain (under-cited). This may reflect the amount of output some years earlier.

GOVERNMENT POLICY DOCUMENTS -1

- Policy is meant to be evidence-based but often evidence is policy-based
- Example of how to deal with alcohol abuse – it causes 10% of DALYs in industrial countries (cf. 11% for tobacco)
- No simple solution (price, restrictions) as with smoking because so many drink and some benefit
- In UK, Prime Minister's Strategy Unit published Interim Analytical Report on alcohol, with 215 references, of which 71 journal articles
- Of these 30 from UK (cf. only 6% of ARR)

GOVERNMENT POLICY DOCUMENTS -2

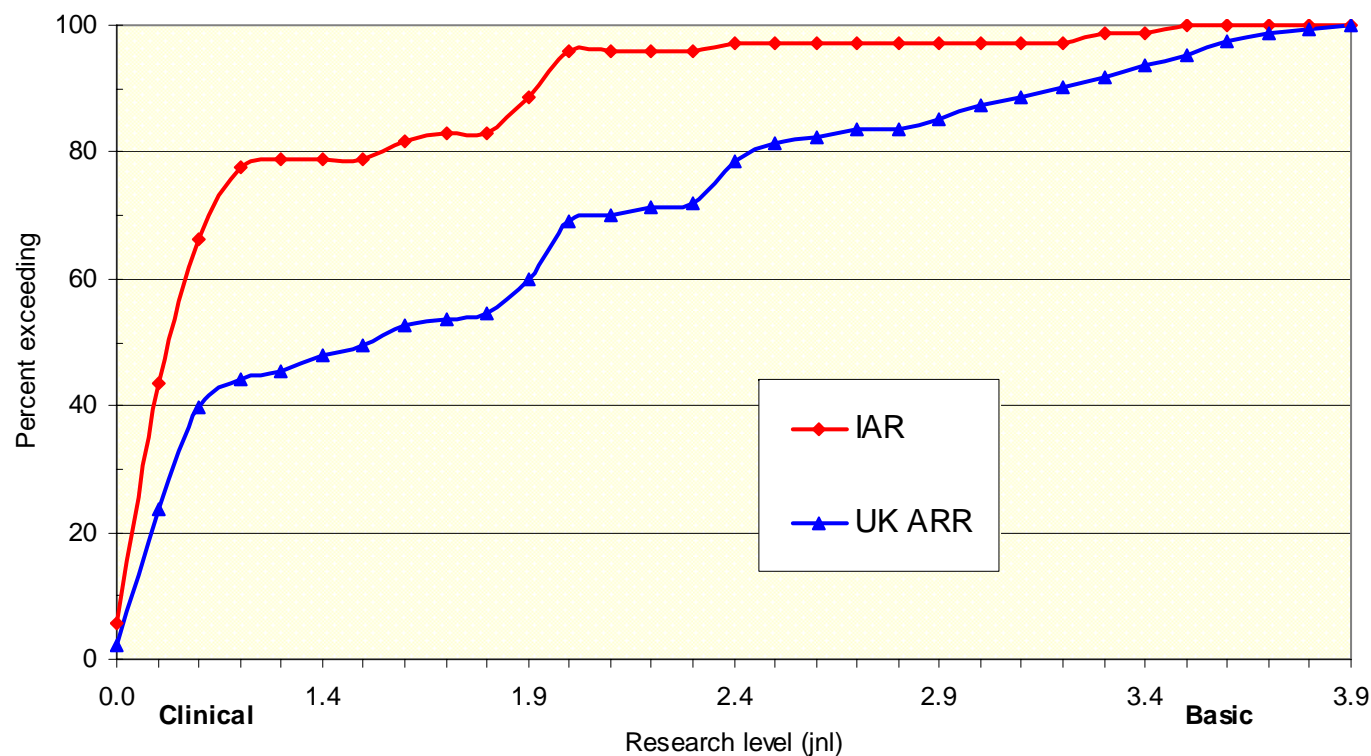
Comparison of nationality of papers cited by Interim Analytical Report on alcohol with national presence in alcohol-related research (ARR)



UK research is much over-cited, as is that from Canada and Australia, but work from continental Europe seems relatively ignored

GOVERNMENT POLICY DOCUMENTS – 3

Comparison of research levels of papers cited by Interim Analytical Report on alcohol with those from UK in alcohol-related research (ARR)



The relevant research for policy is extremely clinical / sociological, but this work may not attract funding as easily as basic research does

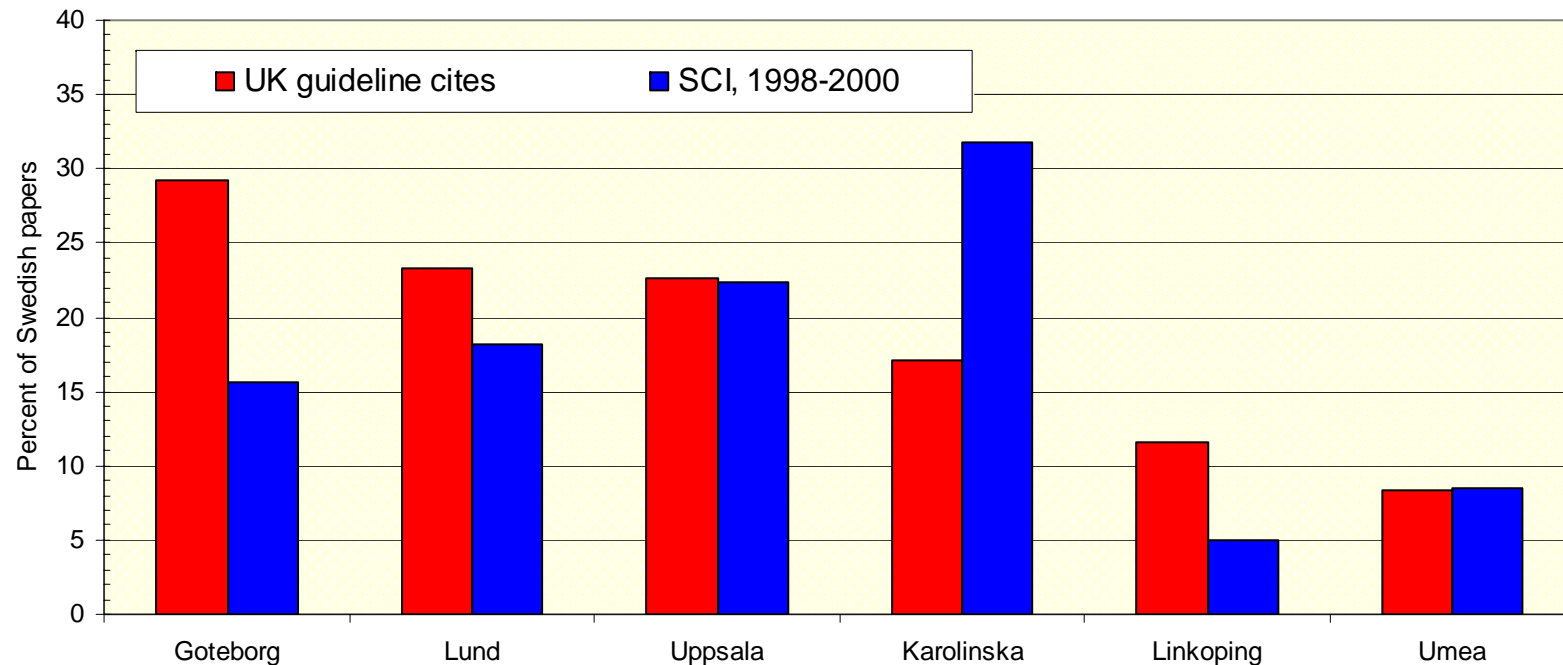
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CLINICAL GUIDELINES -1

- Many organisations and countries now publish them; they don't always agree, though
- In the UK, there are SIGN (Scotland) and NICE (England and Wales) guidelines – currently about 200 in total – plus *Clinical Evidence* from BMA
- Papers cited are mainly clinical (not basic), fairly recent, and many from UK (over-cited by x 3)
- Can analyse relative citation rate of leading UK medical schools and universities – those doing clinical work score higher than those doing basic
- But can also use data to evaluate Swedish medical schools (next slide)

CLINICAL GUIDELINES - 2

Relative performance of six Swedish medical schools, % of all SE on UK guideline cites compared to presence in SCI for 1998-2000



Göteborg and Linköping are performing rather well on this criterion, and Karolinska much less well, probably because the latter does basic work

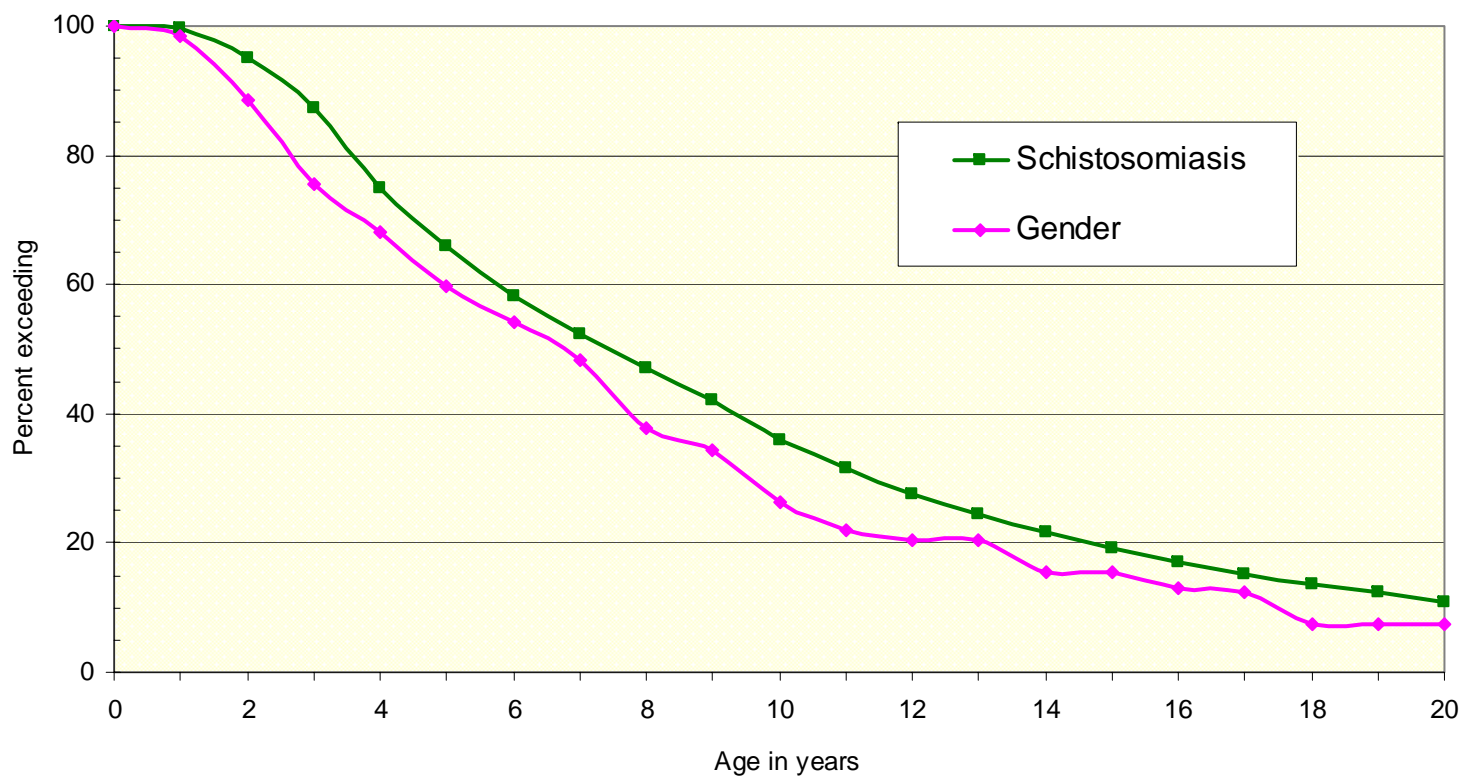
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TEXTBOOKS – 1

- Now a wide range exists, at both undergraduate and graduate level, especially in medicine
- Chapters have many references, some to books in ‘soft’ subjects, but mostly to journal articles
- Technique for analysis similar to that for standards
- References tend to be slightly older than those on scientific papers, perhaps because of delays in publication, and especially in tropical medicine

TEXTBOOKS – 2

Distribution of ages of references in books on schistosomiasis and on gender issues in medicine



Median ages of references are 7 years (Gender issues) and 8 years (Schistosomiasis), cf. 5 years for health research papers in SCI

NEWSPAPERS - 1

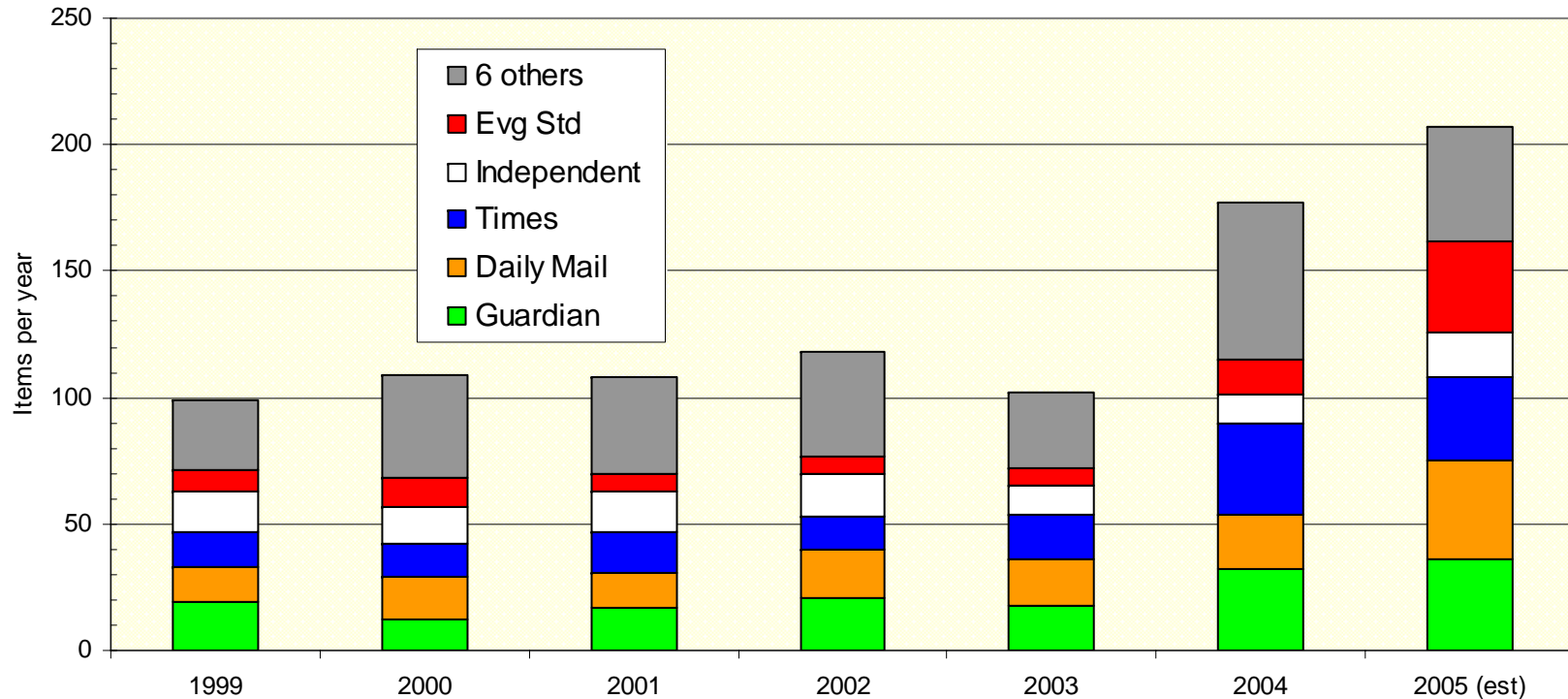
- News articles have many characteristics of journal articles, with author(s), source, reference(s)
- They can be studied at leisure through full-text databases, e.g., ProQuest (UK only), Factiva (from Reuters)
- Articles can be selectively retrieved with search strings and then read to determine relevance and coded for tone (scary or optimistic) and content
- Socio-economic profile and circulation data are available for newspapers allowing reader analysis
- Newspapers are published in almost all countries

NEWSPAPERS - 2

- Many studies on newspaper coverage of science but most are *ad hoc*
- “Death makes news” and deadly diseases get more coverage than debilitating non-lethal ones
- Some newspapers campaign actively on an issue and may distort the scientific consensus (e.g., MMR vaccine in UK ? causing autism, and in South Africa, whether HIV => AIDS)
- News coverage reflects current opinion, as shown by increase in stories about alcohol-related research in 2004 when 24-hour drinking started

NEWSPAPERS – 3

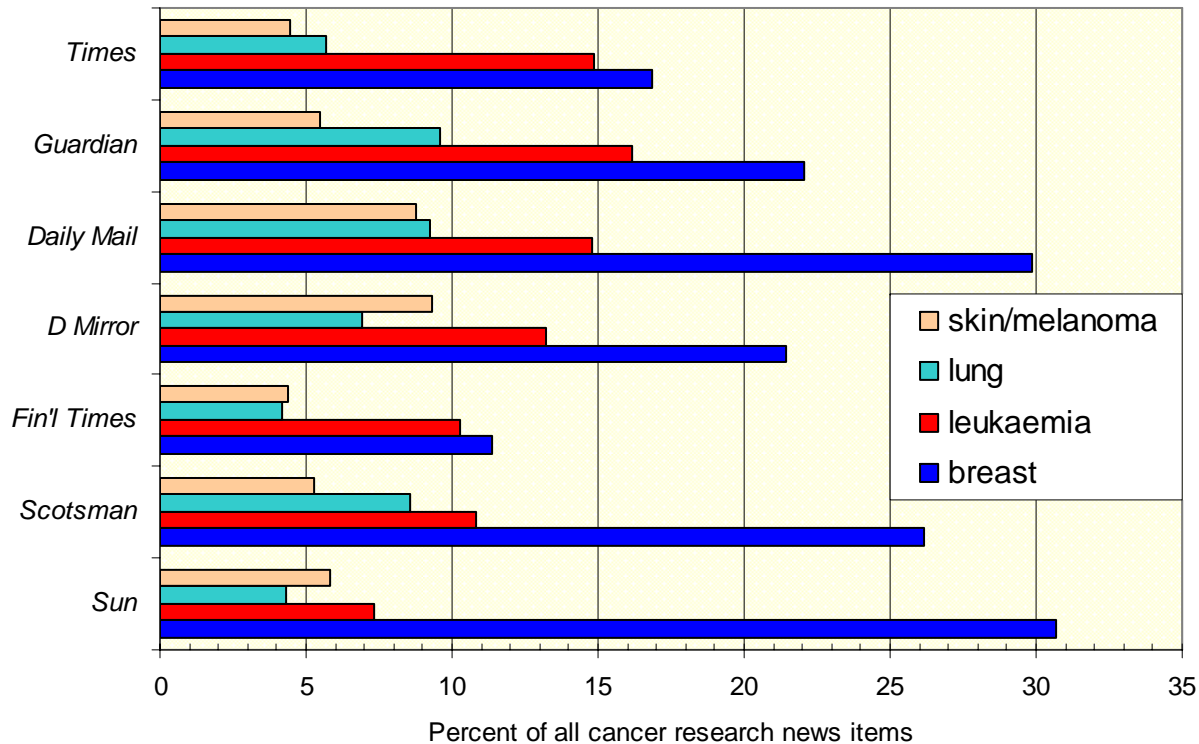
Changes in coverage of alcohol-related research in 11 UK national newspapers. 1999-2005



Level was fairly steady from 1999-2003, but suddenly jumped in 2004 (new licensing regime) and has been maintained in 2005. The Guardian, Daily Mail and The Times give most coverage

NEWSPAPERS – 4

Coverage of different cancer manifestations in seven UK newspapers, 1998-2005



There is a strong correlation between the % of all cancer research stories pertaining to an organ among all newspapers, but The Sun and Daily Mail concentrate on breast cancer and the Financial Times on brain cancer

BROADCAST MEDIA – 1

- **Websites may include stories that are used for broadcasts on radio or television and form a searchable archive**
- **They are usually relatively unbiased because of stricter legislation**
- **They often contain hyperlinks to the cited research article or at least its source and abstract**
- **The BBC archive goes back to July 1998 and can be selectively searched using simple terms**
- **CNN also has a searchable archive**

BROADCAST MEDIA – 2

Example of BBC report on cancer research

Breast implants 'not cancer risk'

Cosmetic breast implants are increasingly popular

Cosmetic breast implants do not increase the overall risk of getting cancer, a long-term study suggests.

US researchers found women with implants had a lower breast cancer risk but a higher chance of lung cancer.

However, in both instances this could be due to factors such as having children and smoking rather than any effect of the implants, they say.

The Journal of the National Cancer Institute study followed 3,486 Swedish women for an average of 18.4 years.



There are no known health risks associated with breast augmentation

RELATED INTERNET LINKS:

[Journal of the National Cancer Institute](#)
[British Association of Aesthetic Plastic Surgeons](#)
[Cancer Research UK](#)
[International Epidemiology Institute](#)

The BBC is not responsible for the content of external internet sites

[Infection risk of breast implants](#)

05 Feb 05 | Health

['Natural' breast implant advance](#)

17 Feb 05 | Health

[Breast implants 'no risk to life'](#)

02 Jan 05 | Health

[Breast scans 'fail' in some women](#)

26 Aug 04 | Health

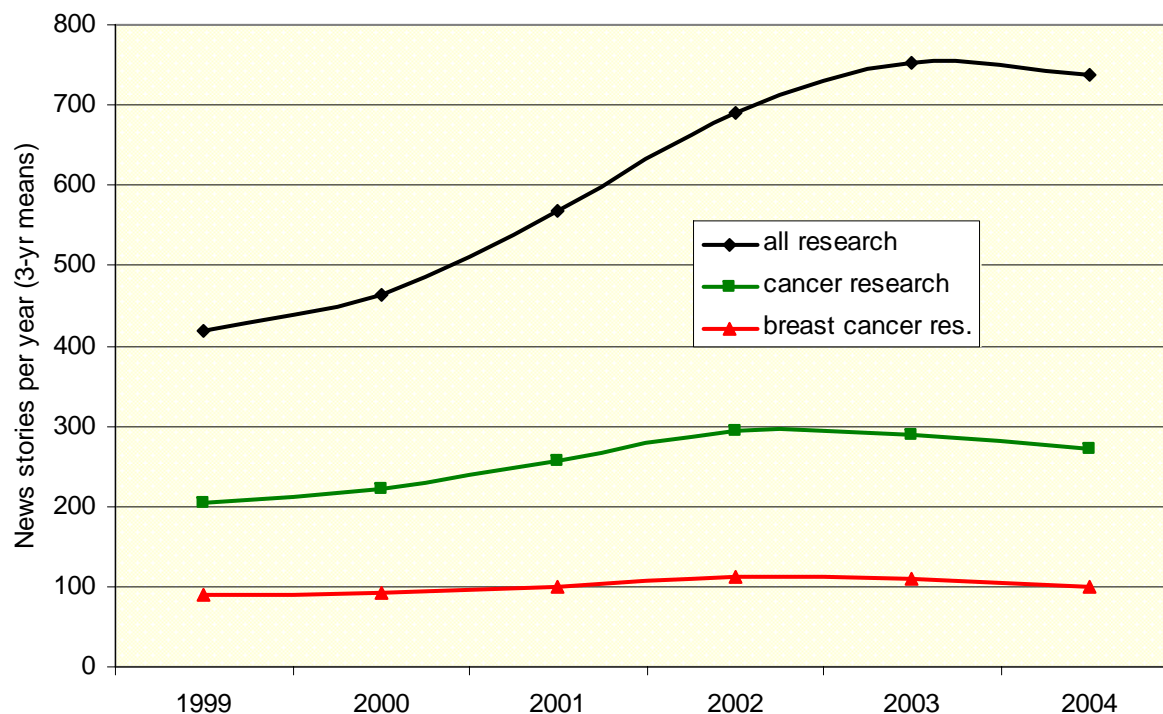
[Breast implant safety crackdown](#)

01 Sep 03 | Health

Note that the journal is cited, and the research institutions and an author are given, with a hyperlink to the journal article: an example of good practice. Also links to earlier stories about breast implants

BROADCAST MEDIA – 3

BBC coverage of all health research, cancer and breast cancer research



A big rise in all health research (nearly x 2), rather less in cancer research (x 1.5, with peak in 2002 and decline), and nearly flat reportage of breast cancer research. Does this reflect public interest in the subjects?

CONCLUSIONS

- **New forms of citation analysis can provide data to complement, but not replace, conventional citation data and peer review**
- **The principles are simple but quite a lot of work is needed to collect the data (especially textbooks)**
- **International collaboration using the same data protocols and methods would be highly beneficial**
- **Public perceptions of research will be increasingly important to determine the agenda**
- **The media can have a powerful pull-through influence in making research useful to society**