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"Good news" for statistics: the contribution of evidence based medicine

(Mr Andrew Booth, University of Sheffield)

- Medical statistics “inherently mathematical and irrelevant” to undergraduates (Altman & Bland, 1991).
- “Tomorrow’s Doctors” required general skills incorporating the need to critically evaluate evidence, develop research skills, solve problems, plus analyse and use numerical data.
- Need for integrated teaching to enhance student learning (Evans, 1990).
- Move from theoretical courses to research and critical appraisal skills (Morris, 2002).

With acknowledgement to: Sedgwick P & Freeman J. Mini Project: *Teaching medical statistics: Working towards the vision of Tomorrow’s Doctors*

The “Philosophy”

- “You don’t need to be able to build a car to drive one” – Professor Mike Campbell
- Author of “*Statistics from Pole Position*”?



The Challenge

- To make statistics and research design Relevant
- To make statistics and research design Interesting/Meaningful
- To build and consolidate learning in a “step-wise” fashion
- To present statistics on a need to know basis
- To avoid “dumbing down”

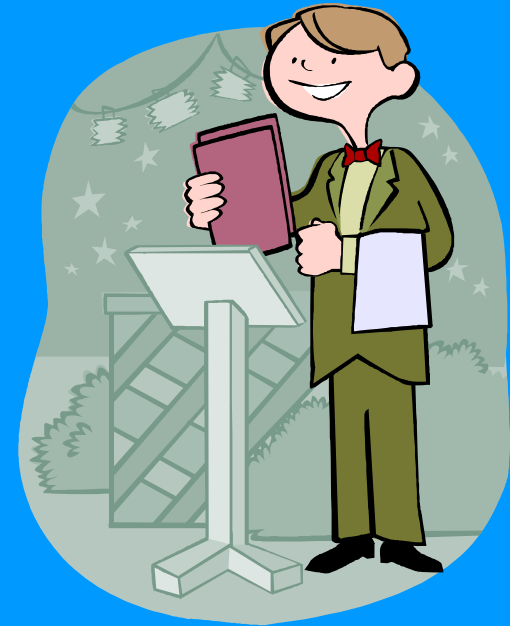
Key principle

- Statistical methods cannot overcome bad data and poor research design



The Course Menu

- CASP Technique – Use lay reports of research as Entrée (e.g. advertisements, news items, etcetera)
- Progress to Randomised Controlled Trial as Main Course
- Conclude with Systematic Review as Dessert





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Example: You can't beat smoking with
Cold Turkey!

Nicorette

doubles

your chances of
giving up
smoking!



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Hitting the Headlines hthA4.pdf (application/pdf Object)

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Hitting the Headlines

Should we believe what we read in the press?

Introduction

Health stories are news stories. Most days, newspapers carry reports about health care, including stories about the effects of new treatments or diagnostic tests. Such stories can create expectations or anxieties in patients and pressure for health professionals. It is important therefore to know the facts behind the headlines.

This poster has been designed by the Centre for Reviews and Dissemination (CRD) at THE UNIVERSITY of York, to help health care professionals to assess the reliability of news stories and the quality of the research evidence on which they are based.

Need to know more?

'DRUG RISKS OUTWEIGH BENEFIT'

When faced with such a headline ask yourself:

- Does this story have implications for my practice?
- Will patients want advice and answers to questions?

If the answer to these questions is 'yes', you may need to take a closer look at the research behind the headline.

Hitting the Headlines - www.library.nhs.uk

Staff at CRD locate and critically examine the research behind the headlines. Unbiased, brief and readable summaries appraising the research evidence are posted on the National Library for Health (NLH) web site within 48 hours of publication. You can search the archive for topics covered previously by *Hitting the Headlines*: www.library.nhs.uk

Take a closer look

Has the story already been covered by *Hitting the Headlines*? If not, here's how to do it for yourself:

Finding the research

<p>Sometimes the newspaper article just says that 'researchers have found...' but gives no further clues.</p> <p>Although you cannot search for the specific research behind the story you can do a general search of the web using keywords in the article to discover if anyone else has mentioned this research. Contact your local librarian for help.</p>	<p>Sometimes the newspaper story will only report the name of a researcher, an organisation or a scientific conference. Some detective work will be required.</p> <p>You can search the web for the researcher's name, organisation, funding body or conference. Contact your local librarian for help.</p>	<p>Identifying the research can be relatively straightforward if a newspaper article clearly states that it has been published in a named journal (e.g. BMJ or Lancet). Many journals are available in your local health care library or on the web (many charge for access). Contact your local librarian for help.</p>
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Found it! Now what?

Just because it has been published, you should not accept the

Unable to find the research ?

If you can't find the research behind the news story you may still

start

Unused Desktop Shortcuts 21:18

What we did - 1

- Waited for major health news story (HRT and Breast Cancer)
- Purchased every daily newspaper on topic
- Selected three newspaper articles from *The Times*, *Guardian* and *The Sun* with different reporting
- Provided guided reading questions

What we did - 2

- Obtained CMOs response as faxed to every single GP Practice
- Asked students to consider patient scenario of anxious woman presenting to General Practice
- What advice would they give?
- **Issues: Background risk, risk trade-off, relative risk**

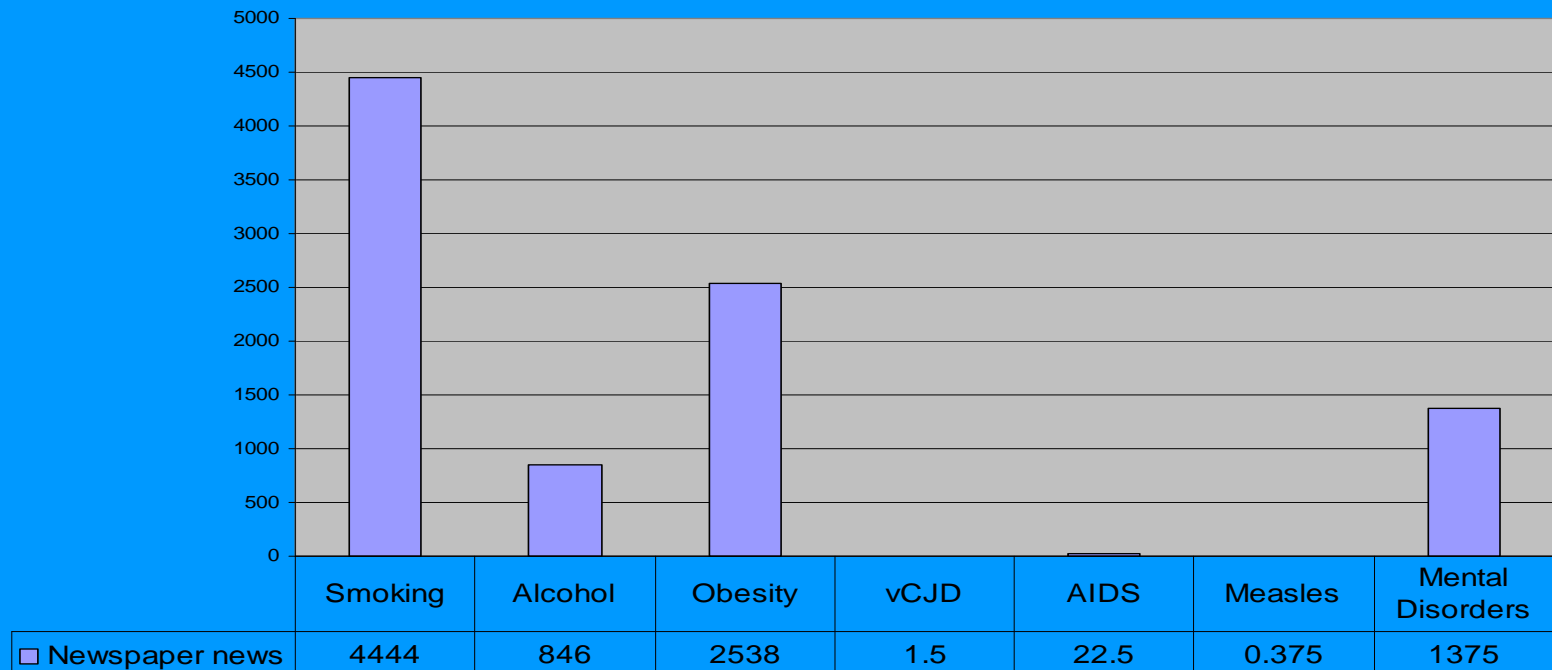
<i>Stage</i>	<i>Concepts</i>
News Item	Relative Risk, Absolute Risk, Incidence, Prevalence
RCT	Odds Ratios, Sample Size, P Values, Risk Differences, Numbers Needed to Treat
Systematic Review	Forrest Plots, Tests for Heterogeneity, Confidence Intervals, Weighted Mean Difference

A Rich Vein!!

- "The way alleged health risks and supposed new treatments are described in the media is not only distorting in itself and misleading for the public, but also has the potential for disastrous effects on public policy due to the government's obsession with populism and presentation."
- King's Fund (2003) analysed health reporting by BBC, Daily Mirror, Daily Mail and Guardian. Compared volume of reporting on health risks with attributable deaths.
- Skewed towards dramatic stories, rather than issues with statistically greater impact e.g. smoking, obesity, mental health and alcohol misuse.

Deaths per story (King's Fund)

Deaths per Story: Newspaper news



Evidence Based News Reporting?

- Probability of inclusion in press releases similar for observational studies and RCTs. Trials less likely to be covered in papers (OR 0.15 (95% CI 0.06-0.37)).
- Good news and bad news equally likely to be press released. Bad news more likely to be reported in papers (1.74 (1.07-2.83)).

(Bartlett et al, 2002)



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Caution: Some soft drinks may seriously harm your health

EXPERT LINKS ADDITIVE TO CELL DAMAGE – The Independent Sunday, 27 May 2007



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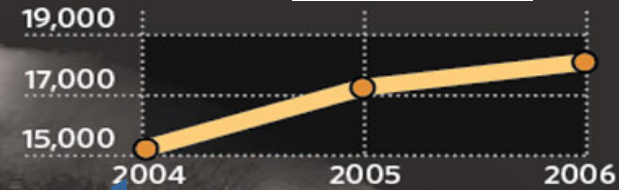
Mobile phones 'more dangerous than smoking'

BRAIN EXPERT WARNS OF HUGE RISE IN TUMOURS AND CALLS ON INDUSTRY TO TAKE IMMEDIATE STEPS TO REDUCE RADIATION –

The Independent Sunday, 30 March 2008

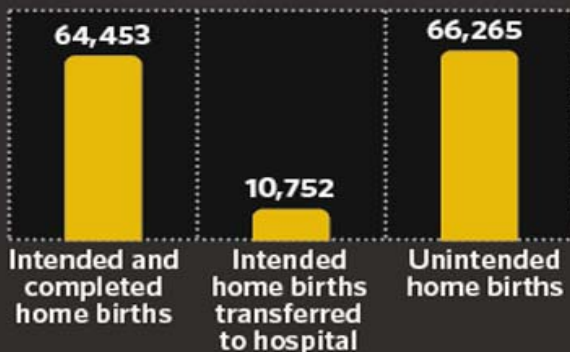


HOME BIRTHS ENGLAND AND WALES

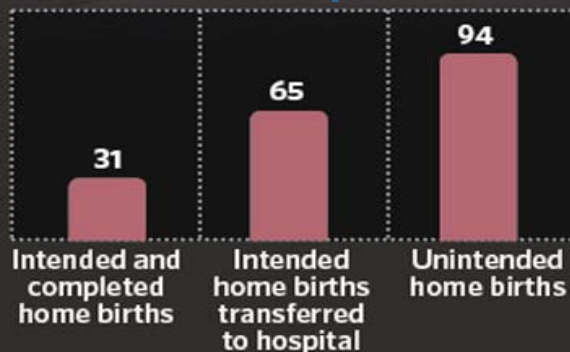


The Big Question: What are the risks of home births, and are they greater than in hospital?

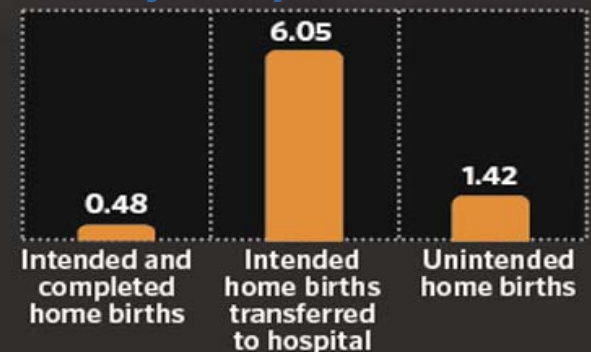
NUMBER OF BIRTHS 1994-2003, ENGLAND AND WALES



NUMBER OF CHILD DEATHS 1994-2003, ENGLAND AND WALES



MORTALITY RATE FIG. 100 BIRTHS ENGLAND AND WALES 1994-2003



The Independent Wednesday, 2 April 2008



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ScHARR
SCHOOL OF HEALTH AND
RELATED RESEARCH

Why eating just one sausage a day raises your cancer risk by 20 per cent

By Fiona Macrae

Daily Mail 31st March 2008

The World Ends.....With a Banger or a Wimpy?

72 Comments on Daily Mail Website in 48 hours.

- Including: “Sorry, but I just don`t believe this nonsense. Do five sausages a day increase the risk by 100%?”
- And: “According to these and many other statistics, I should have been dead long before I was born”

Opportunity for Evidence Based Mattesons?

- Cancer risk raised by 20% of exactly what base figure?

I'd like to see someone for once do the maths honestly: how many tonnes of sausages (and other preserved meats) are eaten in this country (and, indeed, worldwide) and how this relates to frequency of rectal cancer?

- Alarmist twaddle. Based on figures within the article - assuming they're accurate, 20% increase in risk raises it from one male in 20 to 1.2 males in 20 who will get bowel cancer within their lifetime - hardly grounds for hysteria.
- “It's not as clear as is presented. Those who eat more processed meat tend to be the poorest in society, and so are also more likely to be obese, take less exercise, smoke more etc”.

Some Variations

BMedSci Students = 3rd Generation Oral Contraceptives

- “Baseline risk of DVT among young women without risk factors is about 5 per 100 000 person-years for non-users, 15 for users of 2nd generation pill, and 25 for users of 3rd generation pill.
- If a woman asks about her chance of dying she is told that the mortality of deep venous thrombosis is 1-2%, about 2 per million users (*British National Formulary*).

But what about.....

Pregnancy?

- 60 women per 100,000 develop VTE in pregnancy.

Abortion?

- 8% rise in number of abortions in following year, equating to approximately 13,000 abortions

MPH Students = Aricept for Alzheimers (Economic Evaluation)

Mail launches campaign to end restrictions on Alzheimer's drugs | the Daily Mail - Microsoft Internet Explorer

Address: http://www.dailymail.co.uk/pages/live/articles/news/news.html?in_article_id=438776&in_page_id=1770

Search for: Google "daily mail" alzheimers £2.!

Daily Mail 24 HOURS A DAY

7 April 2008

Search the Mail online: This site Business directory

News

Mail launches campaign to end restrictions on Alzheimer's drugs
by JENNY HOPE - [More by this author](#)
Last updated at 16:30pm on 27th February 2007

Comments (56)

As the devastating human and financial cost of dementia is revealed, the Daily Mail launches a campaign to end the restrictions on drugs to treat Alzheimer's disease. Already 750,000 Britons are affected by dementia - more than half of them with Alzheimer's - at an estimated cost to the nation of £17 billion a year.

DONATION COUPON

HOW YOU CAN HELP
If you would like to make a donation to help the Alzheimer's Society's campaign, cut out this coupon and follow the instructions.

Daily Mail ALZHEIMER'S APPEAL

I am donating £ Daily Mail's Alzheimer's appeal

Title..... Forename..... Surname.....

Address..... Post code.....

Make your cheque out to 'Daily Mail' and send to Alzheimer's Appeal, PO Box 95, Aldershot, Hants, GU11 9GL

Alternatively you can make a contribution by Visa, Mastercard or Switch by calling our 24-hour, automated donation line on 0870 085 1024. Calls charged at national rate.

Femail

Judy Finnigan ditches the wheelchair, but still needs a stick to help her walk
The chat host was in better shape as she heads for home through Miami airport but had a face like thunder

'I love being a call girl - I'm in control,' boasts fallen child genius
'I've always had a high sex drive - and now I'm getting all the sex I want' leave

Meet Single Parents Like You

start | Unused Desktop Shortcuts | 21:52

Some Variations - 2

- 750,000 Britons affected by dementia - more than half with Alzheimer's - estimated cost of £17billion a year
- Yet NHS's “rationing watchdog” NICE has banned Alzheimer's drugs which could hugely reduce that bill - even though they cost just £2.50 per patient per day.
- (NNT for Aricept = 12)

Source of Stories?

- **Presswatch Health News | Monday 07th of April 2008**

Menace of sites that urge teens to starve

Fish oils diet can fight Alzheimer's

Autistic baby risk

Parkinson's sufferers lack help

Alligators could help the fight against MRSA

NHS and Health Sector News



SEARCH

TNSMI Health News

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07/04/2008

Daily Telegraph

By: Staff

Fish oils diet can fight Alzheimer's

A diet rich in fish oils helps to protect against the onset of Alzheimer's disease, new figures show. The new research, carried out at the University of Aberdeen, studied 120 people over the age of 64 who had sat intelligence tests at school in 1947, and found that elderly people who consume plenty of omega-3 acids perform better in intelligence tests than those who do not.

07/04/2008

Daily Telegraph

By: Staff

Autistic baby risk

Headlines: [RSS](#)

[Last update: 07/04/2008]

- [Menace of sites that urge teens to starve](#)
- [Fish oils diet can fight Alzheimer's](#)
- [Autistic baby risk](#)
- [Parkinson's sufferers lack help](#)
- [Alligators could help the fight against MRSA](#)
- [NHS and Health Sector News](#)

Text Size: [A](#) [A](#) [A](#)

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Take Home Messages

- Popular (lay) health topic (e.g. cranberries for UTI)
- Little clinical knowledge; emphasis on statistics
- Increasing complexity – progressive revelation (even changing their “verdict”)
- Patient level not population level (cp. skin cancer for a Health Authority)
- Lifestyle factors
- Treatment not prevention

References

- Bartlett C, Sterne J, Egger M. **What is newsworthy? Longitudinal study of the reporting of medical research in two British newspapers.** BMJ. 2002 Jul 13;325(7355):81-4
- Harrabin R, Coote A, Allen J. **Health in the News: Risk, reporting and media influence.** September 2003 | ISBN 978 1 85717 480 9 | 48 pages.