



Public Health
England

Protecting and improving the nation's health

Risk or benefit communication



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Thanks to Theresa Marteau and Stephen Sutton (many slides borrowed) University of Cambridge

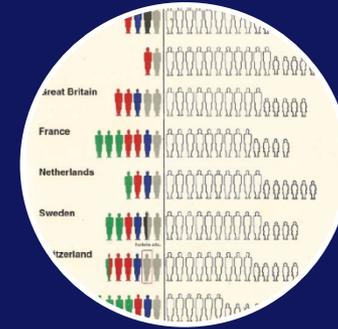
Public health v Occupational health



Individuals



Groups



Populations



Informed choice



Normal two aims of risk communication

Inform people about the risks

Persuade people to change their behaviour

Examples

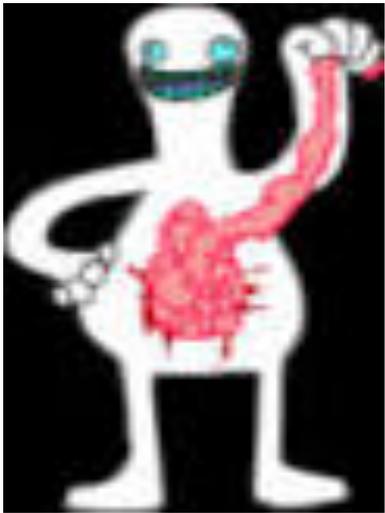
1. Group of staff with above average blood pressure
2. Several episodes of suicides in a large staff complement
3. Six cases of shingles
4. Mass redundancy in the workplace

Evidence v emotions



Health risks, especially long-term risks,
may not motivate behaviour change

e.g. being more physically active may make people feel
better, look better and help with losing weight



Can the public understand numbers?

Bowl 1: 1/10
beans red

Bowl 2: 8/100
beans red



**53% think greatest
chance of getting
a red bean is in
bowl 2**

Deyes-Ray and Epstein 1994

Conveying numerical risk information

Risk information relates to *groups*

Low numeracy: 17 million adults in England have primary school level numeracy (Skills for Life Survey 2011)

Particular problem with understanding probabilities and percentages

Adaption slide from Stephen Sutton

Can physicians understand numbers?

A quiz based on study by Schwartz (1997)

1. A person taking Drug A has a 1% chance of having an allergic reaction. If 1,000 people take drug A, how many would you expect to have an allergic reaction?
2. A person taking drug B has a 1 in 1,000 chance of an allergic reaction. What percent of people taking drug B will have an allergic reaction?
3. Imagine I flip a coin 1,000 times. What is your best guess about how many times the coin would come up heads in 1,000 flips?

72% of physicians got all questions right. “Collective statistical illiteracy” (Gigerenzer)

Use frequencies instead of probabilities

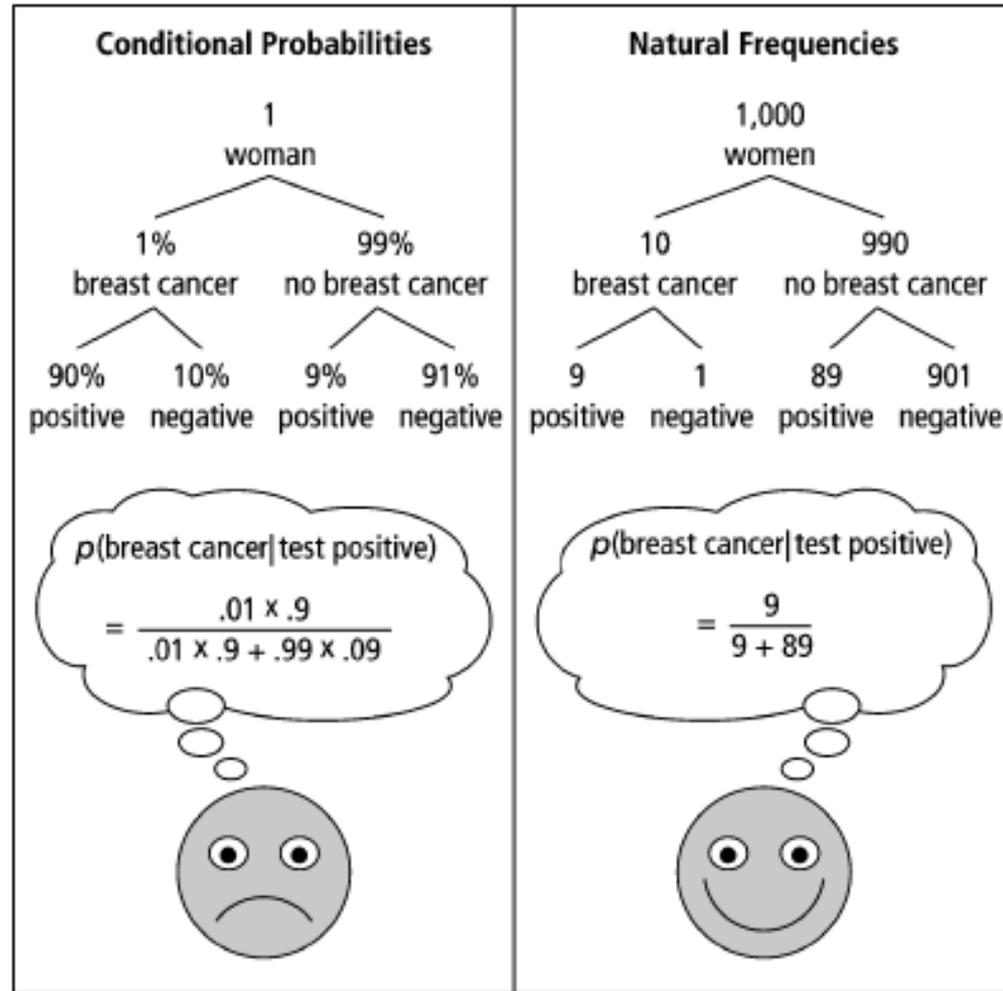
(a) Your risk of having a heart attack in the next 10 years is 15%.

(b) Out of a 100 people like you, 15 of them will have a heart attack in the next 10 years.

(c) Out of a 100 people like you, 15 of them will have a heart attack in the next 10 years and 85 won't. (We don't know whether you will be among the 15 who do or the 85 who don't)

- Many studies show improved understanding when risk information presented in **frequency format**
- People are good using information presented in frequencies (Gigerenzer)

Adaption of slide from Stephen Sutton



Gigerenzer G et al. Helping doctors and patients make sense of health statistics. *Psychological Science in the Public Interest* 2008;8:53-96

Quantitative measures

Absolute Risk Reduction (ARR): The actual difference for two groups e.g.

2% of people experience a migraine following treatment A compared to 4% taking a placebo, the ARR is 2%.

Relative Risk Reduction (RRR): The proportional difference for two groups e.g.

2% of people experience a migraine following treatment A compared to 4% taking a placebo, the RRR is 50%.

Quantitative measures

Number needed to treat (NNT): Estimate of the number of patients who need to be treated so one more person benefits/avoids an adverse event

If a treatment is known to save the lives of 50% of the people it is given to, two people would need to take the treatment in order for it to save one further person.

NNT is 2

Which measure is best?

Measure	NNT	RRR	ARR
Understanding	Worst		Best+
Action		Best	
Magnitude of risk		Seen to be exaggerated	

+Baseline risk needed too.

Evidence

Sheridan (2003) **NNT worst** understood v ARR, RRR

Natter and Berry (2006) on flu, **NNT worst** understood v ARR, RRR.

Carling (2009) . Statin initiation more likely if RRR v ARR.

Systematic review: Zipken (2014) **ARR understood better**, RRR increase perceived magnitude of risks

Graphical presentation of risk

Series of **web-based experiments** on participants aged 40-65 recruited by a research agency.

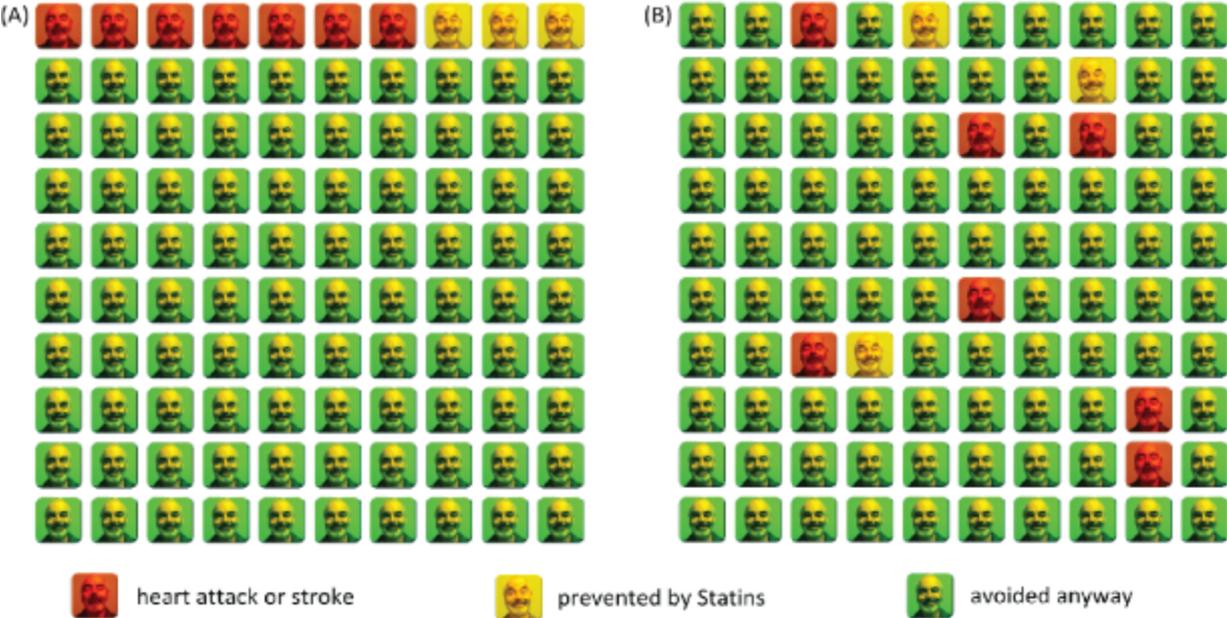
Measured numeracy and varied format of risk information.
Outcome measure: recall of risk information one week later –
“gist” measure: **% who correctly recalled a personal risk**
value that was higher than the average risk value

Overall correct recall was 50-60%. Numerate participants did better. **In most cases graphics didn't help.** Where they did help, they only benefited the most numerate participants

Mason D et al. One-week recall of health risk information and individual differences in attention to bar charts. *Health, Risk & Society* 2014;16:136-153
Adaption of slide from Stephen Sutton

Visualisation

Likelihood of heart attack or stroke in the next ten years for men like David Spiegelhalter who take Statins



Cancer Deaths from Lifetime Radon Exposure

Radon Level	Extra Cancer	Equivalent Smoking Risk	Advice
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Smoking in pregnancy

Smoking during pregnancy causes up to **2,200** premature births, **5,000** miscarriages and **300** perinatal deaths every year in the UK



It also increases the risk of complications in pregnancy and of the child developing a number of conditions later on in life such as:

premature birth



low birth weight



problems of the ear, nose and throat



respiratory conditions



obesity



diabetes



0.5

2.5 in 1000

VERY LOW TO LOW RADON LEVELS

0.1

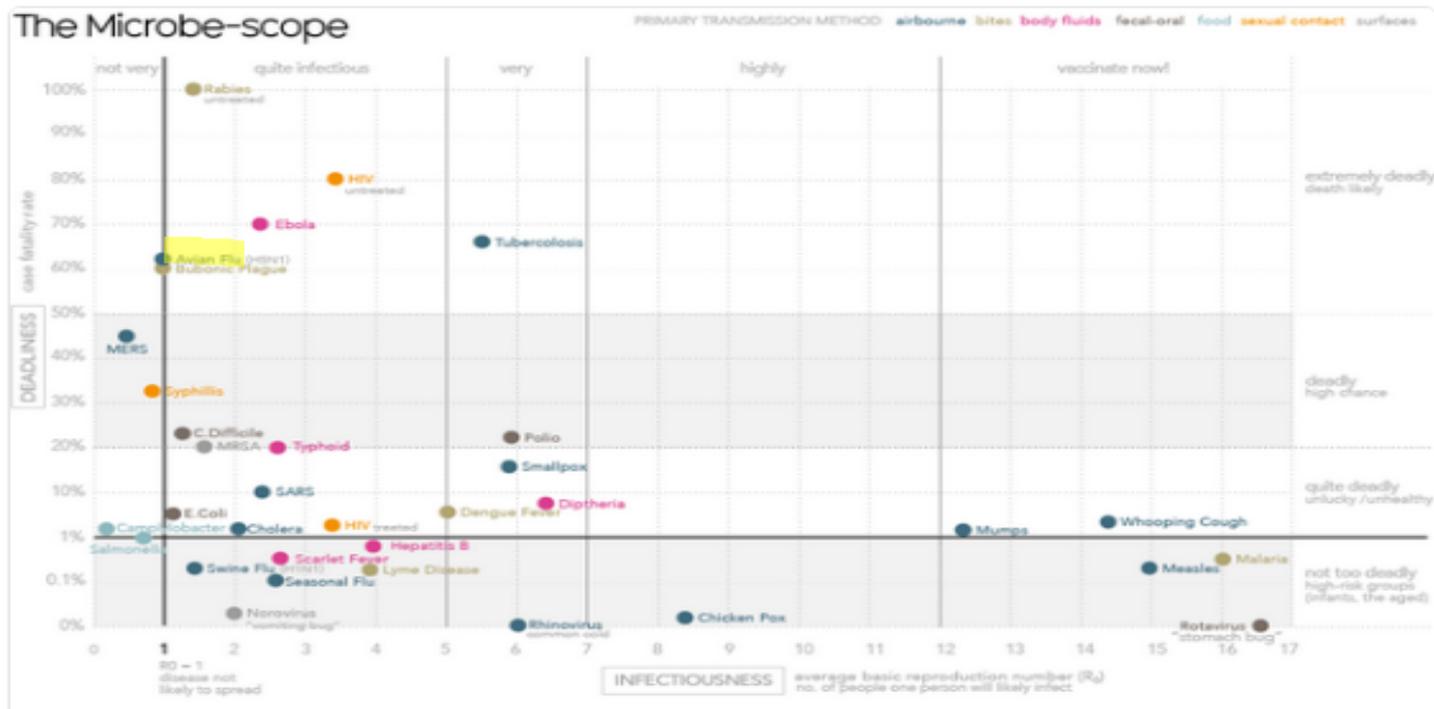
0.5 in 1000



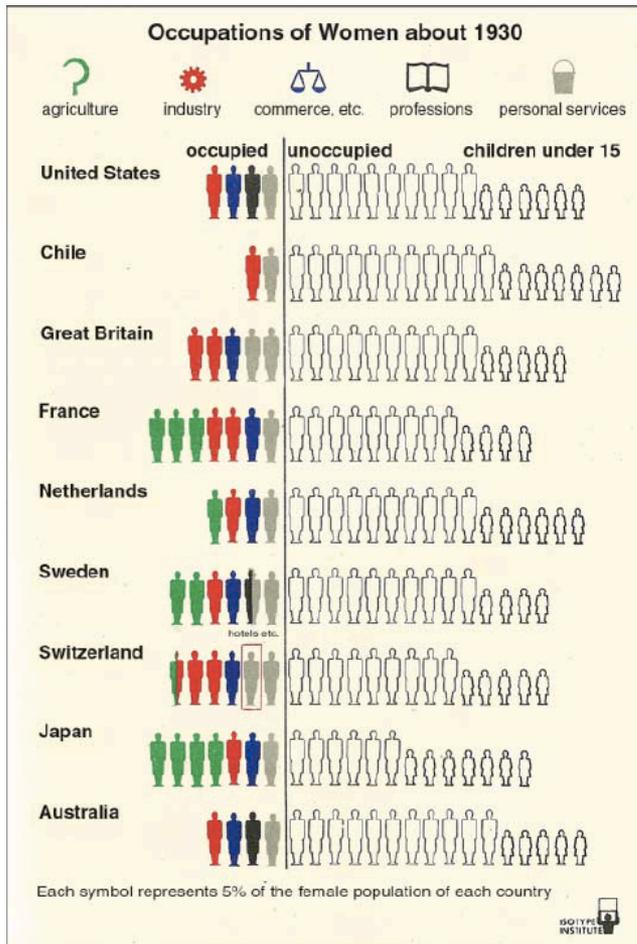
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Visualised: how Ebola compares to other infectious diseases bit.ly/1sH3dDR



Combination



Pitfalls of visualisation – See Spiegelhalter video 26.38 to 31.14

Can communicate risk balance and uncertainty

42.05

<https://www.youtube.com/watch?v=JhfMkmzaNdU>

Alternative approach: avoid numbers

Describe risk in qualitative terms e.g.

“Very likely”, “higher than average”, “low risk” etc.

Use visualisations to show risk in qualitative terms e.g. traffic light system

Adaption of slide from Stephen Sutton



Qualitative reporting

Can add descriptors. EU recommended verbal descriptors with the 1998 (revised 2009):

Very common >10% (more than 1 in 10 people)

Common >1% and <10% (less than 1 in 10 but more than 1 in 100)

Uncommon 0.1% to 1% (less than 1 in 100 but more than 1 in 1000)

Rare 0.01% to 0.1% (less than 1 in 1,000 but more than 1 in 10,000)

Very rare <0.01% (less than 1 in 10,000)

'Common' (in EU terms) refers to side effects occurring in 1-10% people, but on average patients interpret the word to mean around 45%.

Summary?

Public **do not** understand numbers well in general and **physician advising best course** of action may be needed

Visualisation may help if people are numerate

If you use numbers, express: probabilities as frequencies (numerator/denominator using **whole numbers**) and use a **denominator of 1000 participants**.

Express benefits/risks in **ARRs** if you want to **increase understanding**

NB RRR more likely to affect **decision-making**, especially if positively framed

Avoid expressing benefits as NNTs.

It may may help to: place a patient's risk in context by using **comparative risks of other events**

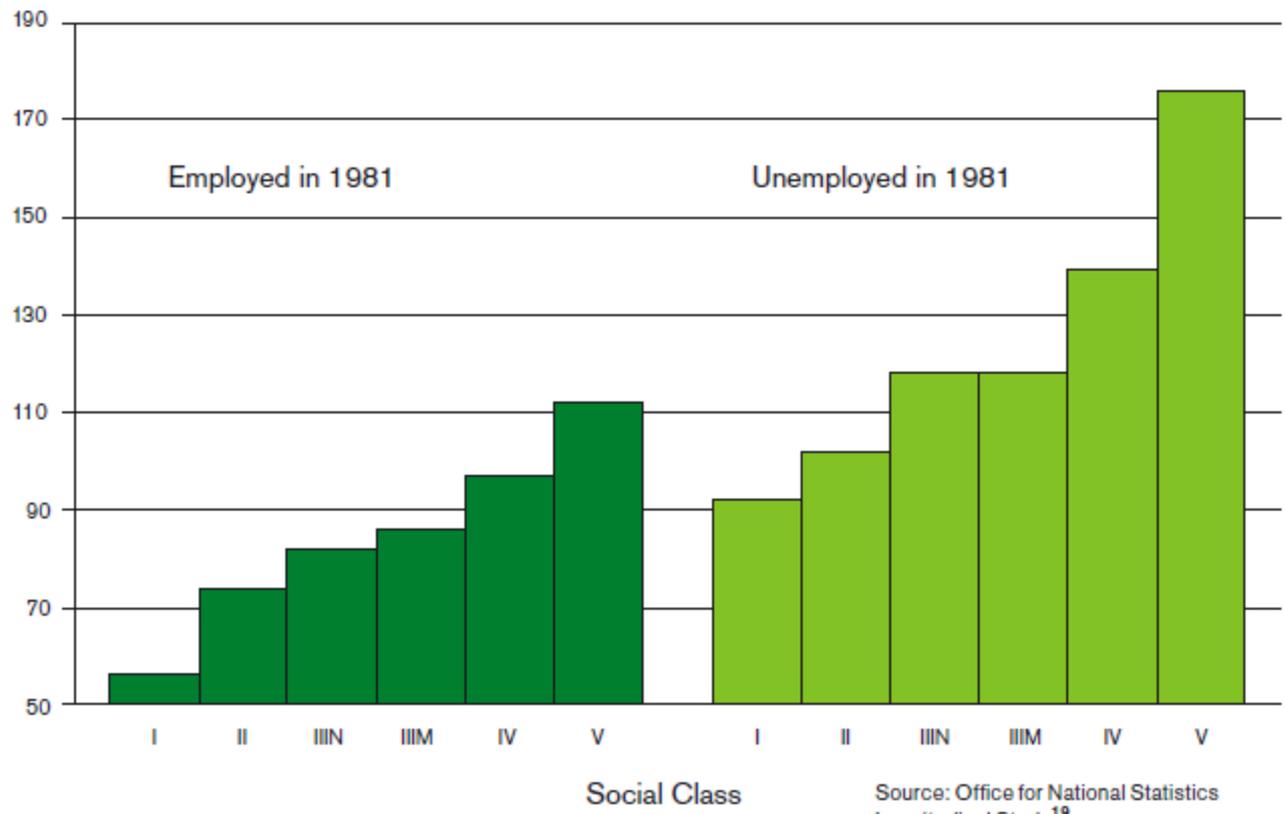
Use qualitative risk descriptors, but quantification is poorly understood (such as 'high risk')

Other areas that are unclear

- quantity of information presented,
- the order in which to present information,
- the use of summary tables,
- best practice on presenting risk information when the evidence base is unclear

Figure 8 Mortality of men in England and Wales in 1981–92, by social class and employment status at the 1981 Census

Standardised Mortality Rate



Source: Office for National Statistics Longitudinal Study¹⁹

Context of communication
Health effects of employment – same effect
as smoking 20 day (Marmot)

Trustworthiness



Are doctors neutral?



Framing

Framing can be positive or negative – eg chance of survival v chance of death

Systematic review - positive framing, leads to more positive perception

Risk communication can be **personalised (individual's risk)**

Systematic review – can lead to more accurate perception (eg screening)

Message framing

Gain frame: **benefits** of engaging in a behaviour

Loss frame: **costs** of failing to engage in a behaviour

“Protecting yourself from the sun is the surest way to prevent skin cancer”

“Exposing yourself to the sun is the surest way to get skin cancer”

[Detweiler JB et al. Message framing and sunscreen use: Gain-framed messages motivate beach-goers. *Health Psychology* 1999;18:189-196.]

Recent meta-analysis of experimental studies showed that **gain frame was more effective** than loss frame for prevention behaviours ($r = .083$)

Gallagher KM, Updegraff JA. Health message framing effects on attitudes, intentions, and behavior: A meta-analytic review. *Annals of Behavioral Medicine* 2012;43:101-116.

Healthcare as a partnership...

Minimising avoidable harm.

Carrying out the minimum appropriate intervention.

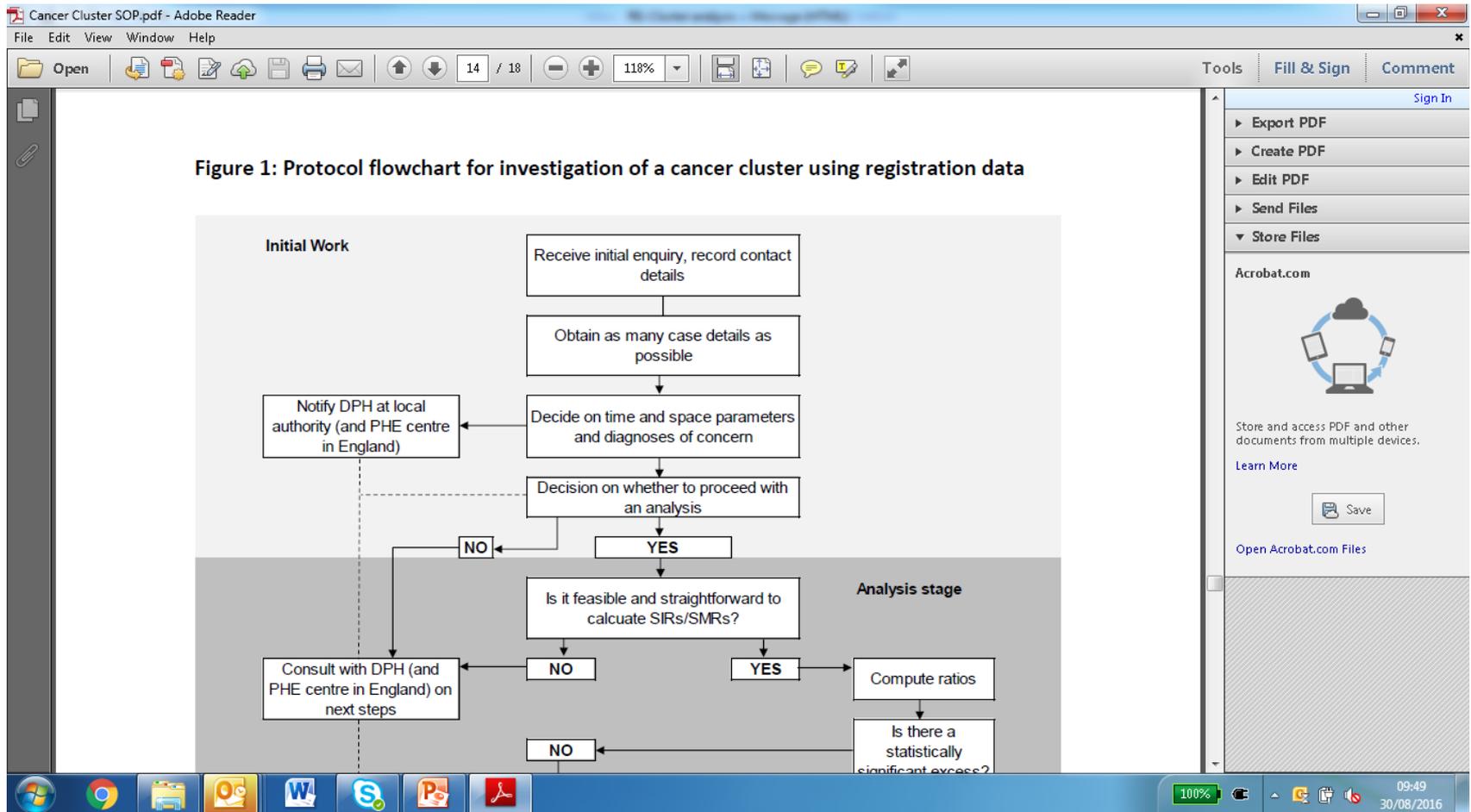
Promoting equity (in conversation) between the people who provide and use services by eg use of decision-aids which give evidence based outcomes information to patients

Decision aids (evidence based information)

(Also on line eg prostate specific antigen testing;
www.prosdex.com)

Systematic review – can lead to better cognitive scores, variable effect on behaviour

Cluster investigation



Top tips for risk communication

1. Not a one-way process of telling people the facts, also engagement.
2. Need to understand what drives people's key concerns. Concerns may be related to family, health of children etc
3. Think about a communication strategy. Do you need to raise awareness?
4. You do not need to treat every case of population health hazard as major communication exercise. Choose techniques that are most appropriate. appropriate.
5. Identify your key stakeholders based on the identified communication need.
6. Early action, good preparation, transparency and openness are essential for creating trust
7. Being a good communicator and being "good with people" requires skill and training.
8. Review progress and remember that risk communication is a process needing adaption.
- 9 Finally, try to keep your messages simple. Risk assessments involve many complexities and uncertainties. Yet stakeholders and members of the public will need clear, succinct, easily understood information and advice.

Adapted from environmental hazard communication advice

Evidence from campaigns

Australian National Tobacco Campaign (1997)

- Tried to convey the health risks in new ways
- Campaign was comprehensively evaluated and seemed to be effective

'Scare tactics' or fear appeals

Emphasise the negative consequences of a given behaviour (particularly severity), using text and/or graphics

e.g. depicting the adverse health effects of smoking

Common objections to fear appeals

- They are unethical
- They don't work
- They are counter-productive



Scare tactics cut smoking rates in Australia to all time low

Simon Chapman, Sydney

Australia's smoking rate, which was stalled throughout the 1990s with around 25% of adults found in several surveys to be smoking, has recommenced its downward slide. The national prevalence of adult smoking has now fallen to 22%, the lowest figure ever recorded.

Australia, like the United Kingdom, Canada, and the United States had experienced a decade long lull in its decline in the prevalence of smoking.

On World No Tobacco Day this week, health minister Michael Wooldridge announced the results of the evaluation of the controversial "Every cigarette is doing you damage" national media campaign which ran from June to November 1997, and which cost \$A7m (£2.9m; \$4.6m).

The campaign has run sporadically since 1997. The television advertisements took viewers inside the bodies of smokers in their 30s to see the damage caused by smoking.

The advertisement found to be most motivating to smokers showed a surgeon's gloved hand squeezing a yellow atheroma out of an aorta at necropsy. Described by smokers as something you "see once and never forget," the advertisements have renewed debate

about the conventional wisdom that scare tactics "don't work" in health promotion.

Scare campaigns have also been used to spearhead the public awareness component of Australia's road safety campaign, which has similarly seen the toll of road deaths reach its lowest point.

All of the antismoking television advertisements gave viewers a telephone number on quitting smoking; the evaluation of the campaign reports that 1 in 4 callers continued to abstain from smoking one year later.

Although the campaign was targeted at adult smokers, evidence emerged that it had also had a powerful effect on teenagers. The campaign is now being run in Massachusetts, United States; Singapore; New Zealand; and British Columbia.

In September last year, deregulation of nicotine replacement treatment saw two pharmaceutical companies, Pharmacia Upjohn and SmithKline Beecham, together spend more than the government on advertising directly to consumers. Sales of nicotine replacement therapy aids rose spectacularly as a result. □

Further information can be found at www.quitnow.info.au.

Fear appeals: evidence

- “A persuader should **promote high levels of threat** and high levels of efficacy to promote attitude, intention, and behavior changes.”
- “Fear appeals motivate attitude, intention, and behavior change – especially fear appeals accompanied by high-efficacy messages. Therefore they can be quite useful to practitioners.....practitioners can easily make their fear appeals effective by providing high-efficacy messages.”
- Conclusions consistent with Sheeran et al (2014) review

Adapted from slides from Stephen Sutton

Witte K, Allen M. A meta-analysis of fear appeals: Implications for effective public health campaigns. *Health Education & Behavior* 2000;27:591-615

Examples

1. Group of staff with above average blood pressure
2. Several episodes of suicides in a large staff complement
3. Six cases of shingles
4. Mass redundancy in the workplace

Enemy of the people Ibsen



Main references

Academy of Medical Sciences, Background paper for 'communicating evidence about medicines' workshop

<http://www.acmedsci.ac.uk/more/events/communicating-evidence-about-medicines-workshop/>

Professor David Spiegelhalter: Communicating risk and uncertainty

<https://www.youtube.com/watch?v=JhfMkmzaNdU>

Edwards, A Communicating risk

*BMJ*2012; 344 doi: <http://dx.doi.org/10.1136/bmj.e3996>

Bradley P et al, Achieving prudent healthcare in NHS Wales

<http://www.1000livesplus.wales.nhs.uk/prudent-healthcare>

Sniffer risk communication booklet *Communicating understanding of contaminated land risks*

http://www.sniffer.org.uk/files/6313/8202/5406/SNIFFER_risk_communication_booklet.pdf