



Help your non-statistician audience make sense of risk

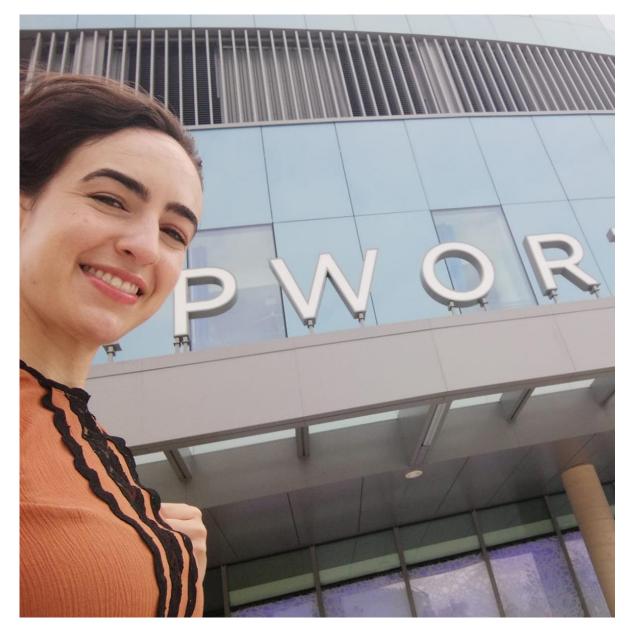
Maricarmen Climént

Risk communication expert

Former member of the Winton Centre for Risk and Evidence Communication, University of Cambridge

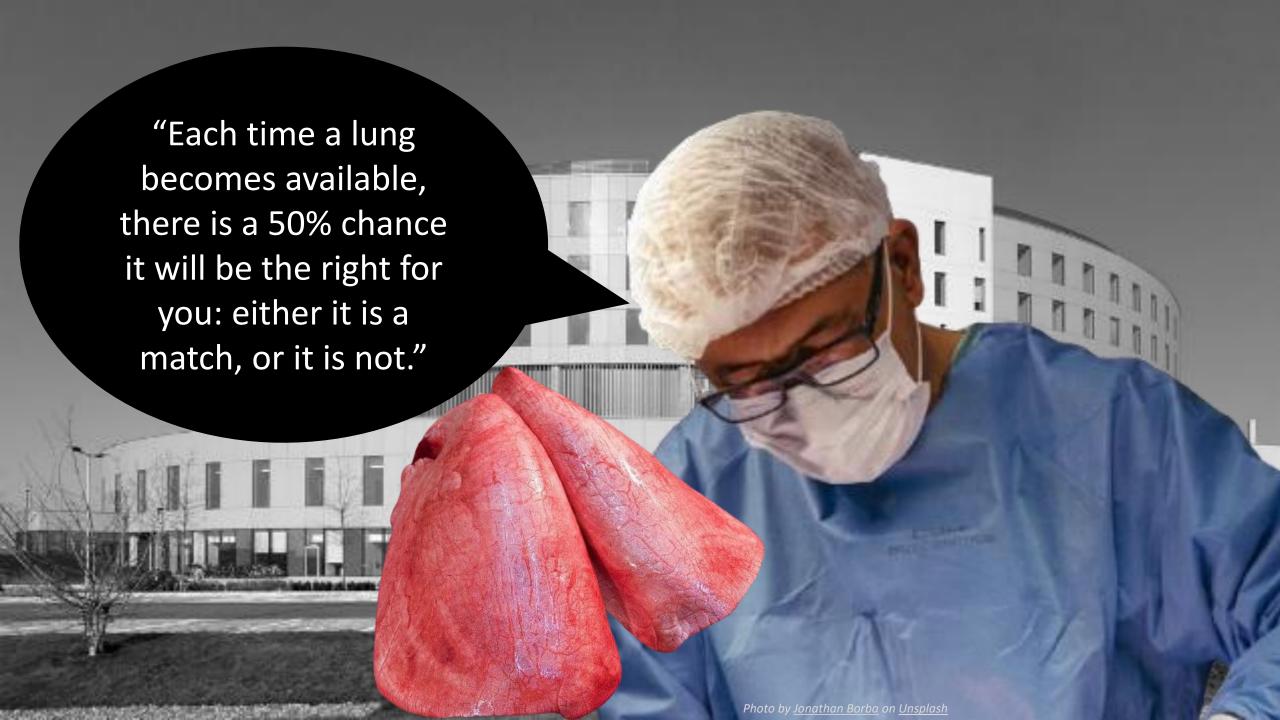
"Conflict of interest: nothing to disclose"

2019-2023

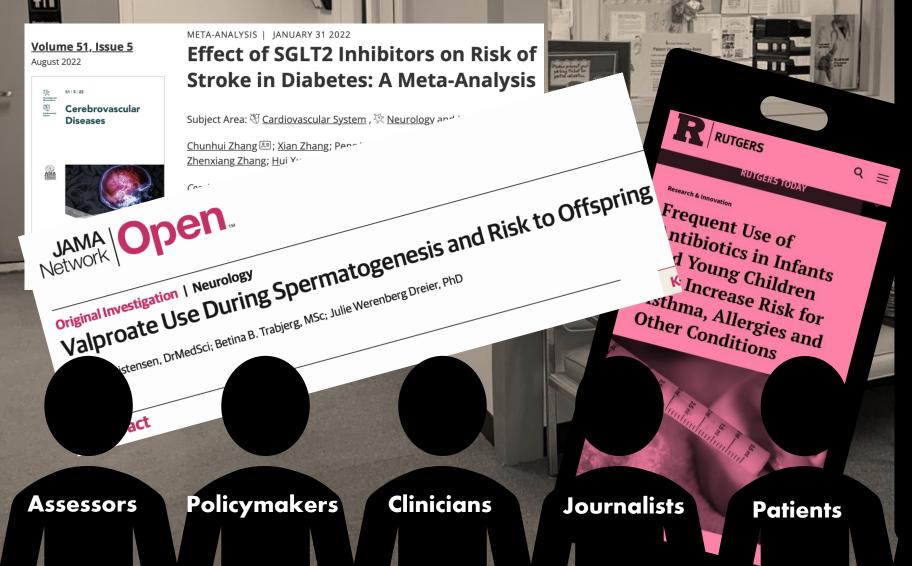


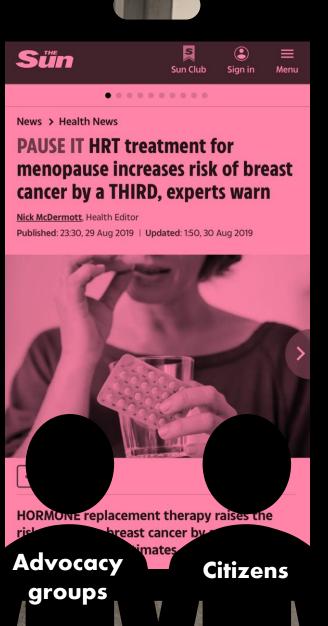


royalpapworth.nhs.uk









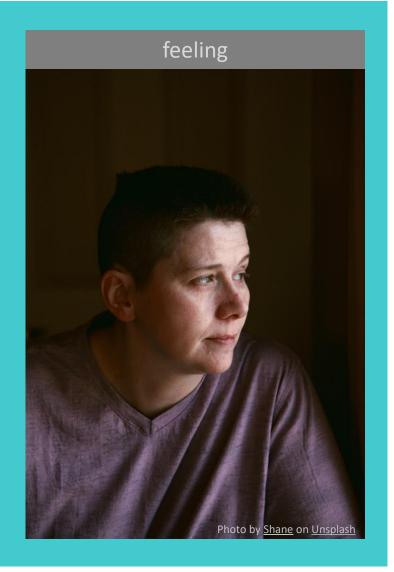
Why is it so hard to communicate risk?



Risk is a complex concept







'Risk' is not (just) a number...

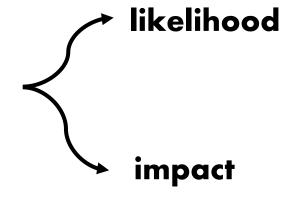


Prof. Paul Slovic

"Risk does not exist independent of our minds and culture", (Slovic, 1992)

Psychologist and **risk** communicator Professor Paul Slovic has pointed out, a 'risk' is not a number – a percentage or probability - **it's a subjective feeling.**

That feeling is influenced by two major factors:

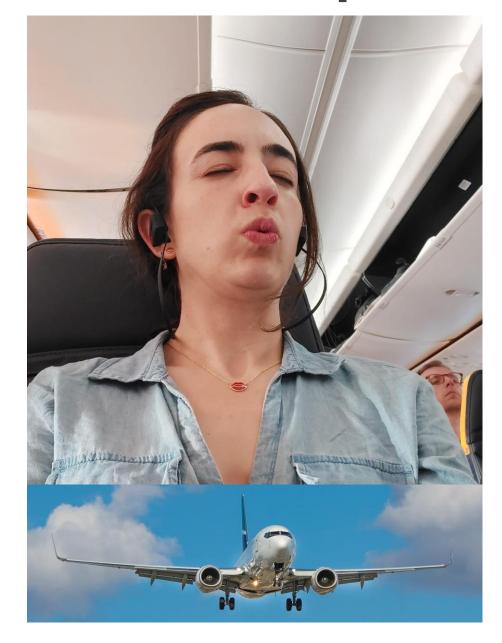


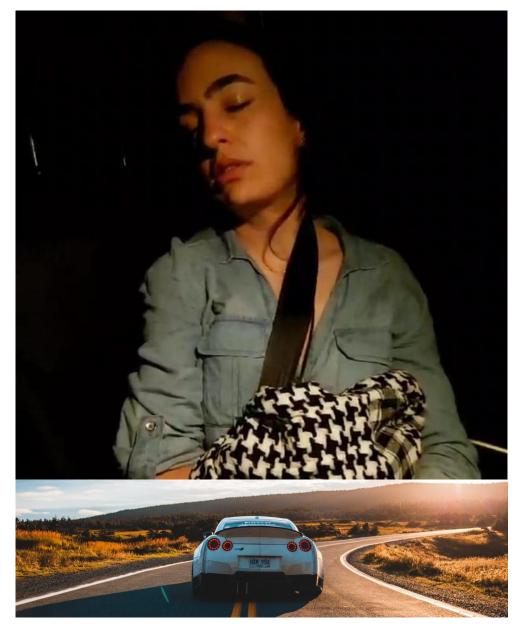
We perceive more risk when:

- -we have a sense of loosing control
- -we think of catastrophe
- -we perceive randomness
- -causes are unknown



'Risk' is also a subjective feeling...





- 1 Never replace numbers with words

Words are often used to describe risks...



Home / Stories

Antidepressant use in pregnant women unlikely to cause seizures in their children



May 12, 2022

■ The Columbus Dispatch



Cases are rare, but children have died while under dental sedation

Catherine Saint Louis The New York | Times

CBS NEWS

HEALTH >

Antidepressants in pregnancy pose little risk to babies, study finds

But are words helpful to understand risks?

1

Never replace numbers with words

Can we use words instead of numbers?



What do you think is the risk of you getting the following side-effects from your statin?

REAL RISK

Constipation ('common'): ? 34% mean estimate 2.5%

Pancreatitis ('rare'): ? 18% mean estimate 0.04%

Never replace numbers with words





- 1 Never replace **numbers** with words
- 2 Consider the **format** of numbers
- 3
- 4
- 5
- 6

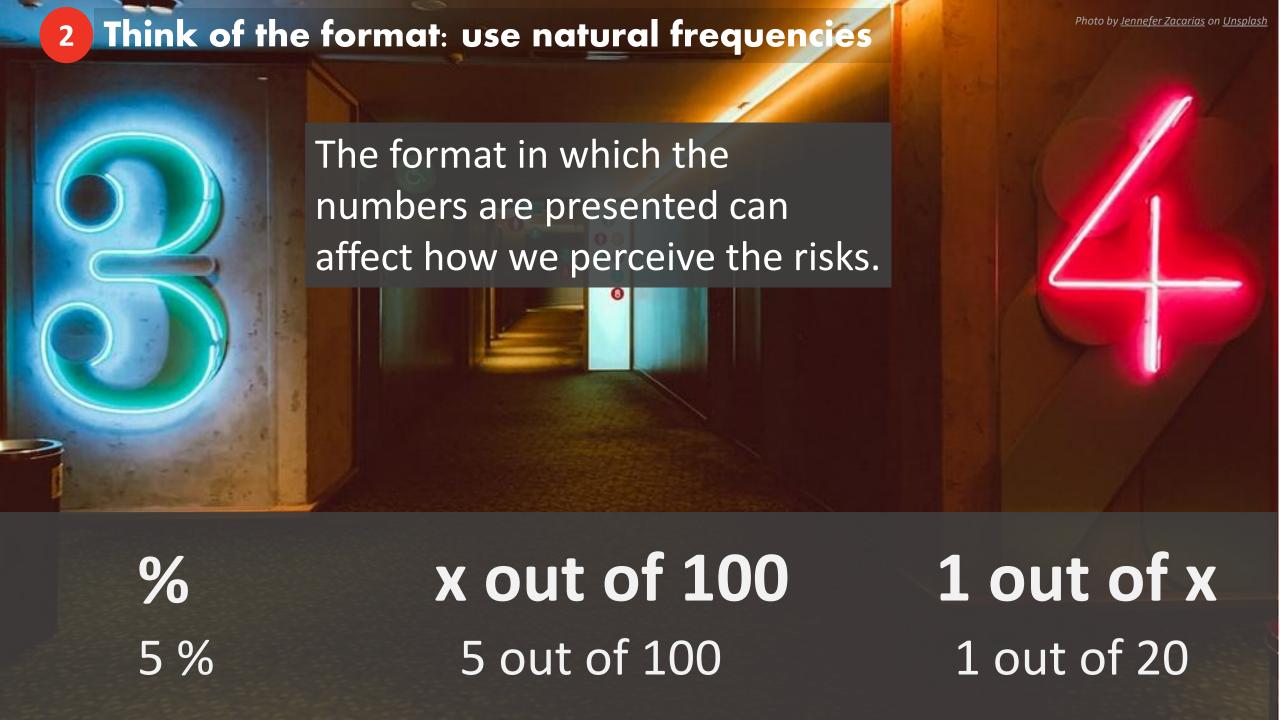
Which car do you think people would be least willing to drive, if the chances of an accident were...?



5 %

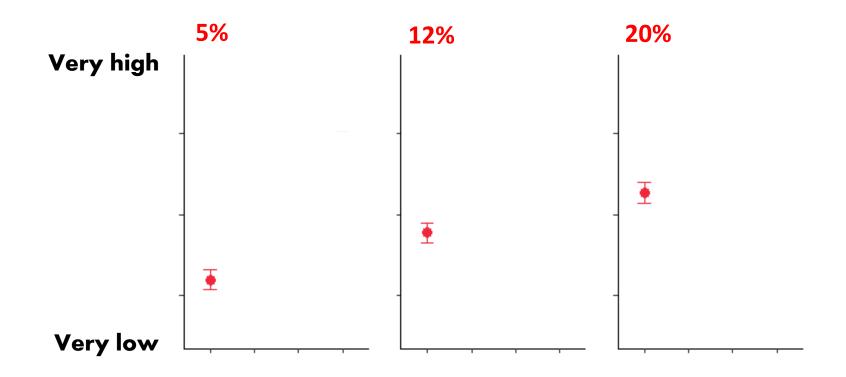
25 out of 100

1 out of 20



Think of the format: use natural frequencies

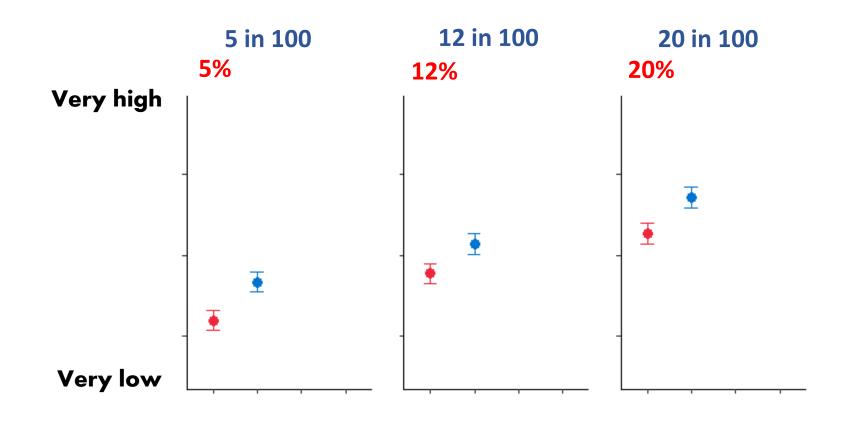
How risky does this chance of dying of COVID-19 feel...?



Freeman, A. L. J. et al. (2021). Communicating personalized risks from COVID-19: guidelines from an empirical study.

Think of the format: use natural frequencies

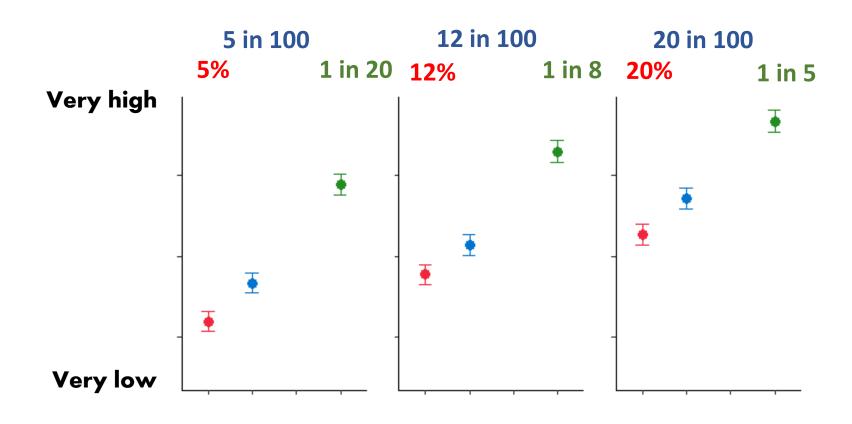
How risky does this chance of dying of COVID-19 feel...?



Freeman, A. L. J. et al. (2021). Communicating personalized risks from COVID-19: guidelines from an empirical study.

Think of the format: use natural frequencies

How risky does this chance of dying of COVID-19 feel...?



Freeman, A. L. J. et al . (2021). Communicating personalized risks from COVID-19: guidelines from an empirical study. Use natural frequencies with SAME DENOMINADOR!

Consider the format of numbers

Use natural frequencies with the same denominator



3 out of 50 versus 4 out of 50



6 out of 100 versus
4 out of 50



1 out of 17 versus
1 out of 12

Be careful with low percentages



10%



1%



0.01%



0.00001%

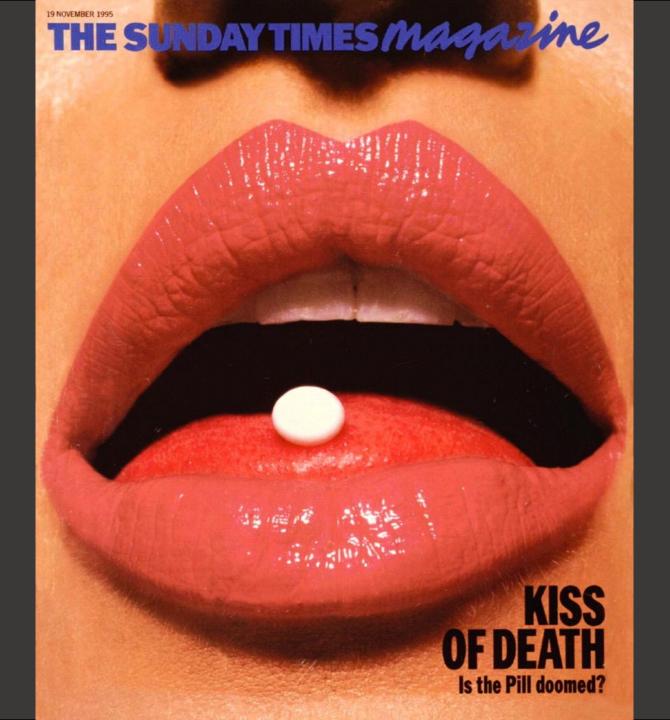
- 1 Never replace **numbers** with words
- 2 Consider the **format** of numbers
- 3 on addition to the relative risk, present the absolute risks
- 4
- 5
- 6



1995 - Official announcement from the UK Committee on the Safety of Medicines.

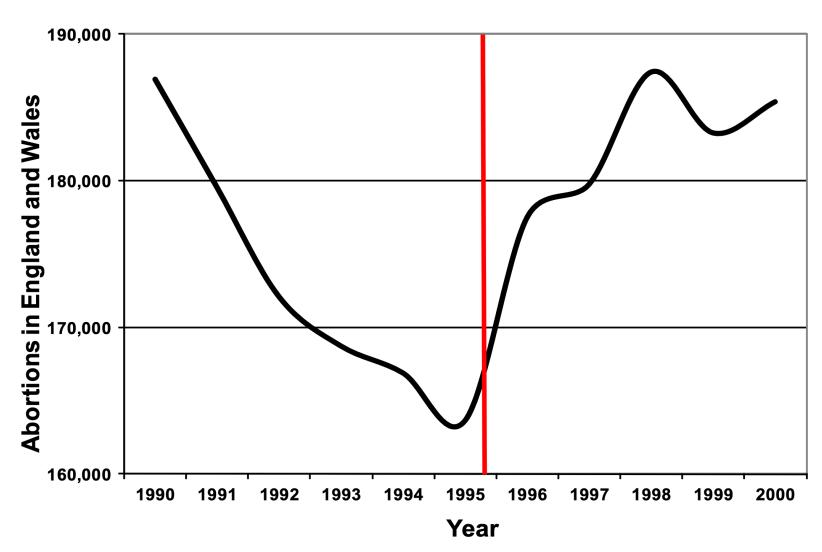
"Contraceptive pills
double the risk of
venous
thromboembolism"

Sent letters to 190,000 GPs, & briefed the press.



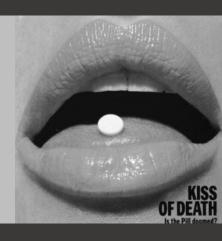
"Contraceptive pills double the risk of venous thromboembolism"

10,000 extra abortions in the following year



Could they have communicated it better?

"Contraceptive pills double the risk of venous thromboembolism"





1995 –UK Committee on the Safety of Medicines.

"Contraceptive pills double the risk of venous thromboembolism"



RELATIVE RISK

But what are the ABSOLUTE RISKS?

Probability of venous thromboembolism WITHOUT contraceptive pills:

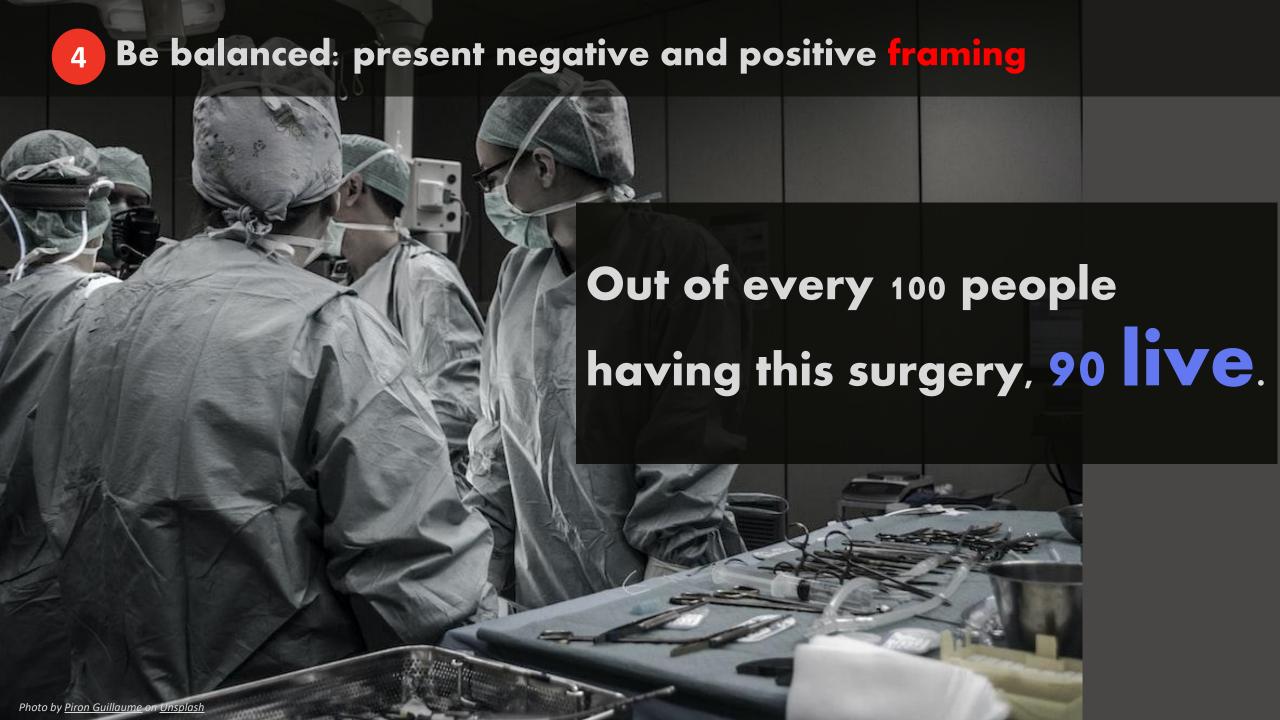


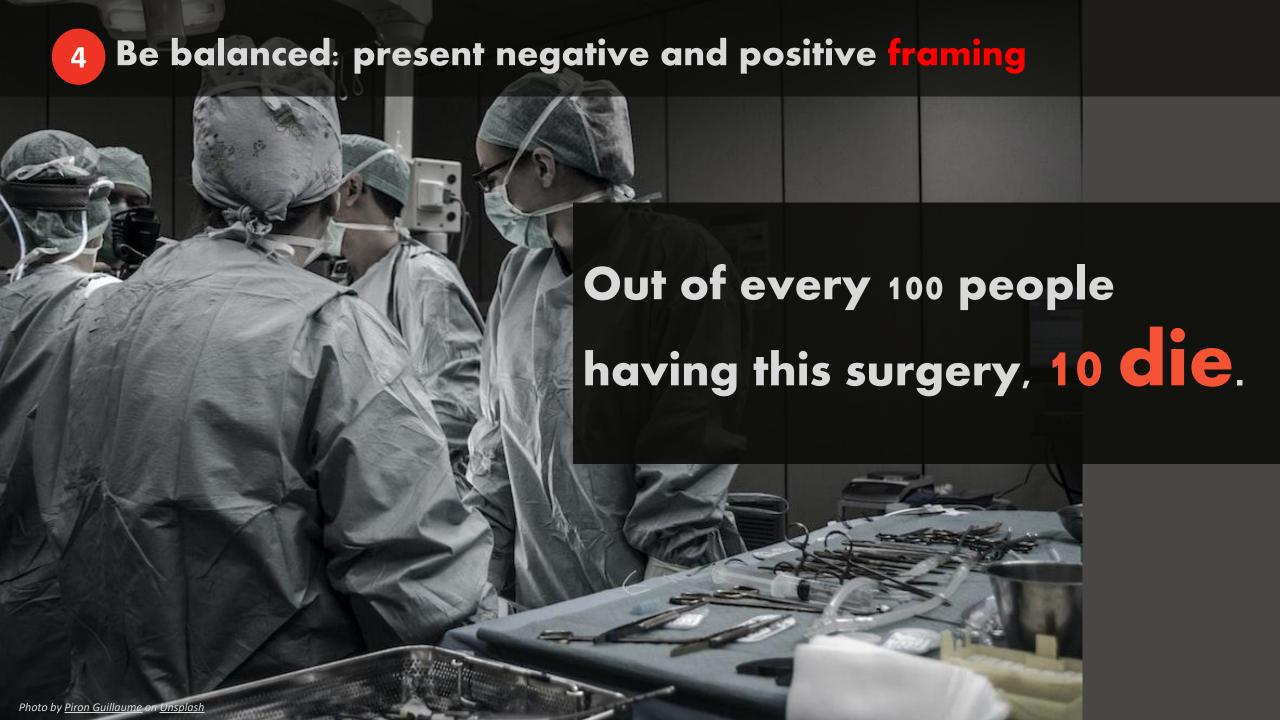
1 out 7000 women per year Probability of venous thromboembolism WITH contraceptive pills:



2 out 7000 women Per year

- 1 Never replace **numbers** with words
- 2 Consider the **format** of numbers
- In addition to the relative risk, present the absolute risks
- 4 Be balanced: always present negative and positive framing
- 5
- 6







Present negative and positive framing



Framing affects feelings and influences people's decisions

(McNeil et al. 1982)

Provide both positive and negative framing.

Present balanced information



TIME

DAILY SPOTLIGHT WHAT TO DO IF YOU CAN'T AFFORD YOUR STUDENT LOANS

HEALTH • COVID-19

Why Countries Around the World Are

Suspending Use of AstraZeneca's COVID-19

Time.com, 2021 by Alice Park

Astra-Zeneca COVID-19 vaccine and risk of blood clots

Shall we continue using this vaccine?

Present balanced information

Weighing up the potential benefits and harms of the Astra-Zeneca COVID-19 vaccine

For 100,000 people **Potential benefits Potential harms** with low exposure risk* ICU admissions due to COVID-19 prevented Specific blood clots due to the vaccine: Age group every 16 weeks: 20-29yr 30-39yr 000000 5.7 40-49yr 10000000000 10.5 50-59yr 60-69yr



^{*} Based on coronavirus incidence of 2 per 10,000 per day: roughly UK in March

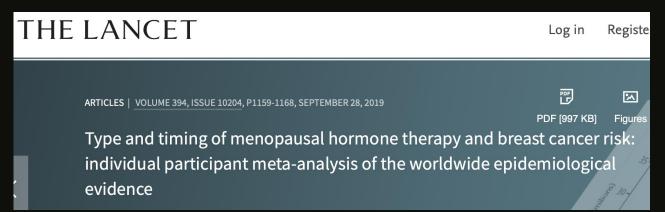
- 1 Never replace **numbers** with words
- 2 Consider the **format** of numbers
- In addition to the relative risk, present the absolute risks
- Be balanced: always present negative and positive framing
- When possible, use visual aids
- 6



When possible, use visual aids



PAUSE IT HRT treatment for menopause increases risk of breast cancer by a THIRD, experts warn



The Lancet, 2019, Collaborative Group on Hormonal Factors in Breast Cancer

Interpretation

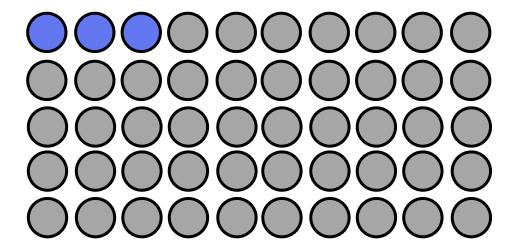
If these associations are largely causal, then for women of average weight in developed countries, 5 years of MHT, starting at age 50 years, would increase breast cancer incidence at ages 50–69 years **by about one in every 50 users** of oestrogen plus daily progestagen preparations.





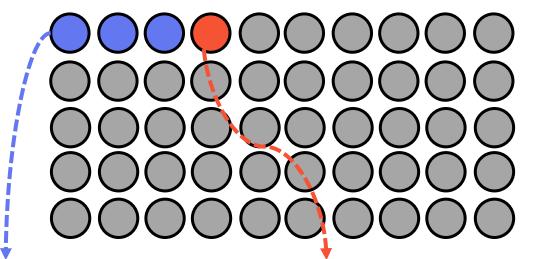
When possible, use visual aids

Number of breast cancer cases expected in women **without** HRT (3 out of 50)



Icon arrays

Number of breast cancer cases expected in women with HRT (4 out of 50 – 1 one extra)

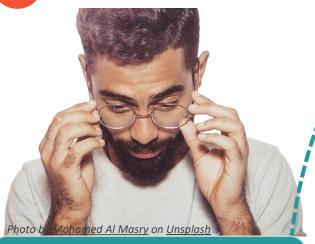


These three would've happened anyway

One additional case would be associated to HRT

- 1 Never replace **numbers** with words
- 2 Consider the **format** of numbers
- In addition to the relative risk, present the absolute risks
- Be balanced: always present negative and positive framing
- When possible, use visual aids
- 6 Explain uncertainties

6 Explain uncertainties



accuracy of numbers -->

Estimations of risks result in ranges (min-max)

The wider the range, the more uncertainty there is.

Use rounded numbers and present a range (between 10-20)

Uncertainty

- -many studies
- -thousands of people
- between 27-33% benefited?
- -single study
- -small and poorly designed
- -3 out of 10 people benefited

quality of the evidence supporting --> the numbers

If the quality of evidence is low, state that.

Otherwise people may asume it is high quality and put too much weight on it in their decision-making.

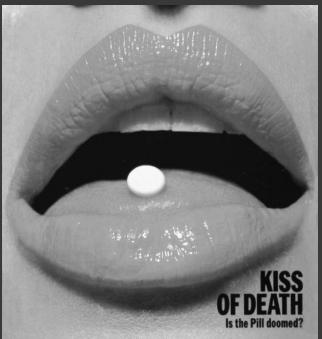
Schneider C. R 2021

what we don't know ->

Explain evidence could change over time, and the advice given too.

- 1 Never replace **numbers** with words
- 2 Consider the **format** of numbers
- In addition to the relative risk, present the absolute risks
- Be balanced: always present negative and positive framing
- When possible, use visual aids
- 6 Explain uncertainties







Thanks!





@maricarmen_climent_



@mc_climent

Maricarmen Climént

Risk communication expert

Former member of the Winton Centre for Risk and Evidence Communication, University of Cambridge