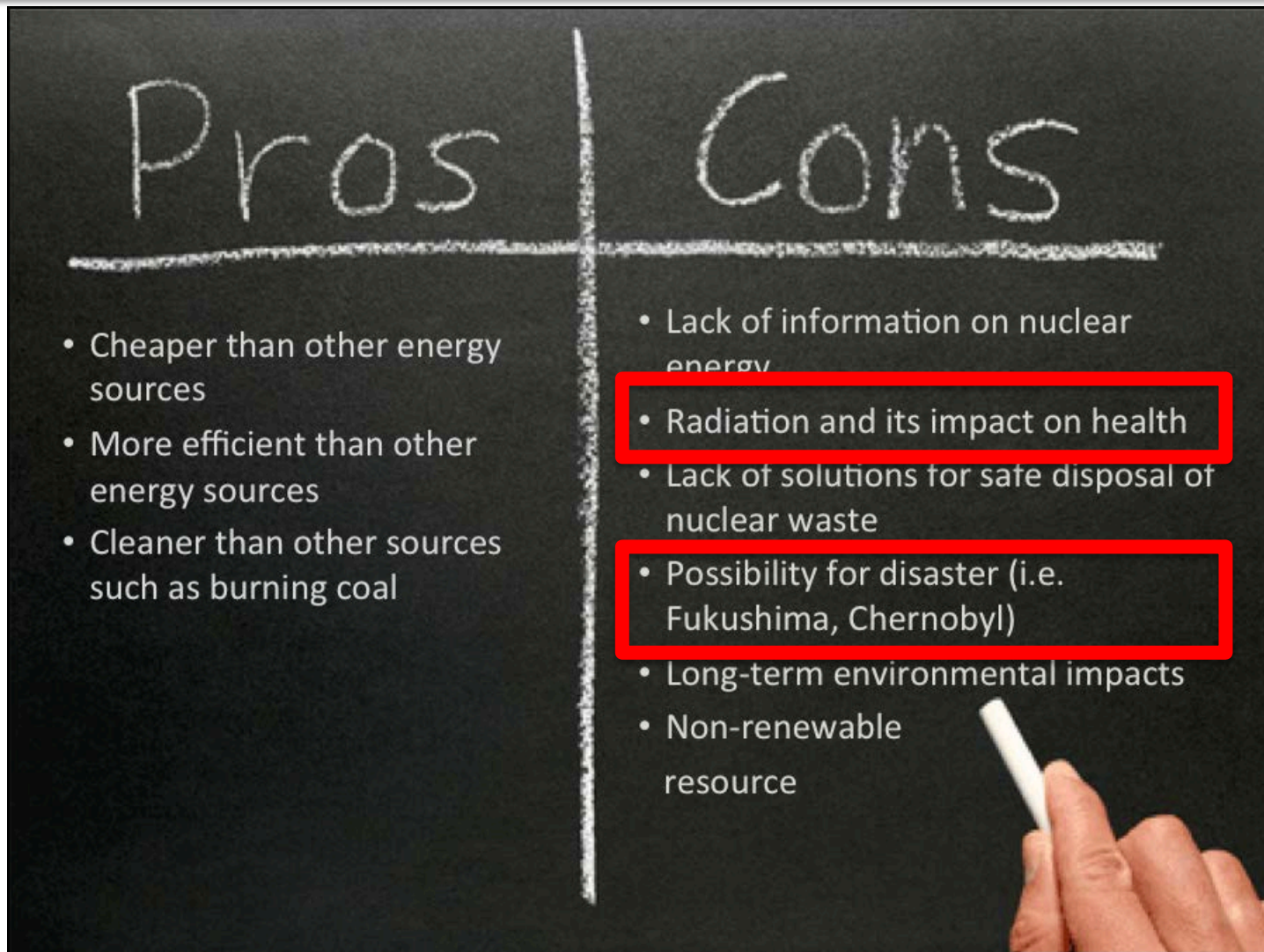


# Health Effects of Nuclear Accidents – facts and fiction

Gerry Thomas,  
Imperial College London  
gerry.thomas@imperial.ac.uk

# Nuclear Power's Image Problem



Ipsos Mori 2014 - >21,000 people in 23 countries

# Public Perception of Radiation

## New Book Concludes – Chernobyl death toll: 985,000, mostly from cancer



<http://www.globalresearch.ca/new-book-concludes-chernobyl-death-toll-985-000-mostly-from-cancer/20908>

### 2065 toll

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The mainstream view puts the toll in five figures. Environmental physicist **Jim Smith** of the University of Portsmouth, UK, prefers to cite a 2006 study by **Elisabeth Cardis** of the International Agency for Research on Cancer in Lyon, France. This predicted that by 2065 Chernobyl will have caused about 16,000 cases of thyroid cancer and 25,000 cases of other cancers, compared with several hundred million cancer cases from other causes.

<http://www.newscientist.com/article/dn20403-25-years-after-chernobyl-we-dont-know-how-many-died.html>

# Chernobyl vs Fukushima

## Chernobyl

- evacuees mean thyroid dose 500 mGy (range 50-5000mGy)
- Non evacuees: 100mGy
- Lifetime exposure 9mSv (6M residents); 50mSv , 150,000 residents

## Fukushima

- evacuees estimated thyroid doses up to 80mGy,
- Non evacuees estimated 45-55mGy
- Actual measured doses mean 4.2 mGy
- Estimated lifetime exposure 10mSv (if no remediation)

**NB – lifetime exposure to background radiation approx 170mSv**

# Chernobyl – Health effects

- 28 from ARS
- 15 deaths from thyroid cancer in 25 years
- 1% death rate overall predicted for thyroid cancer.  
16,000 excess thyroid cancers in total predicted –  
therefore 160 deaths
- No (scientific) evidence of increased thyroid cancer  
outside 3 republics
- No effect on fertility, malformations or infant mortality
- No conclusion on adverse pregnancy outcomes or  
still births
- Heritable effects not seen and very unlikely at these  
doses
- No proven increase in any other cancer (including  
liquidator cohorts)

# Fukushima Health effects

- No radiation related deaths compared with >1500 who died as a result of the evacuation or stress related to it, and approx 20,000 in tsunami
- Unlikely to be any increase in thyroid cancer at the doses received
- Psychological harm due to evacuation and radiophobia – very likely
- Huge economic effect on local area and Japan as a whole

# Risks and benefits of energy production



"We've considered every potential risk,  
except the risks of avoiding all risks"

**Need to balance risks to environment and to individuals**

# Health effects of energy production

Deaths and illness expressed as per TW ( $W^{12}$ )/hr for different sources of energy

	Deaths from accidents		Air pollution-related effects		
	Among the public	Occupational	Deaths*	Serious illness†	Minor illness‡
Lignite <sup>30</sup>	0.02 (0.005–0.08)	0.10 (0.025–0.4)	32.6 (8.2–130)	298 (74.6–1193)	17 676 (4419–70 704)
Coal <sup>31</sup>	0.02 (0.005–0.08)	0.10 (0.025–0.4)	24.5 (6.1–98.0)	225 (56.2–899)	13 288 (3322–53 150)
Gas <sup>31</sup>	0.02 (0.005–0.08)	0.001 (0.0003–0.004)	2.8 (0.70–11.2)	30 (7.48–120)	703 (176–2813)
Oil <sup>31</sup>	0.03 (0.008–0.12)	..	18.4 (4.6–73.6)	161 (40.4–645.6)	9551 (2388–38 204)
Biomass <sup>31</sup>	..	..	4.63 (1.16–18.5)	43 (10.8–172.6)	2276 (569–9104)
Nuclear <sup>31,32</sup>	0.003	0.019	0.052	0.22	..

Markandya and Wilkinson, Lancet (2007) 370: 979-90



# Take home messages

- Health risks are associated with all types of energy production
- Actual health risks from nuclear accidents overstated in the media
- Facts not fiction should be the basis on which energy policy is decided
- Public communication is a key process in deciding the energy mix

Contact: [report@tky.iej.or.jp](mailto:report@tky.iej.or.jp)