

Risk Management: it's not rocket science

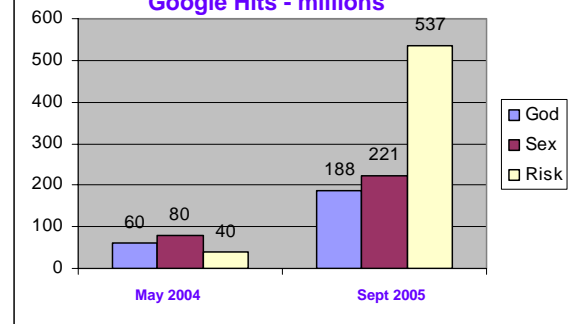
it's more complicated

Three Framing Devices for Thinking about Risk

Imperial College Seminar
15 November 2005
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References
www.geog.ucl.ac.uk/~jadams/publish.htm

Google Hits - millions



Different kinds of Risk: 1

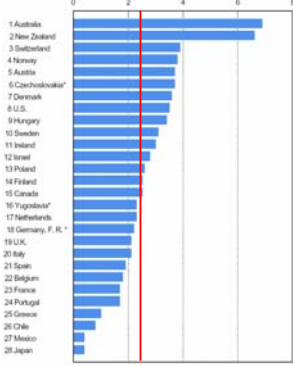
e.g. cholera, need a microscope to see it and a scientist to understand it
Terrorism
 e.g. climbing a tree, riding a bike, driving, car
Events dear boy!
The legal environment
Coca Cola
Belgian chocolates
Contact lenses
Sunbathing
 e.g. global warming, global financial crisis
 Percutaneous coronary intervention
 Stock market

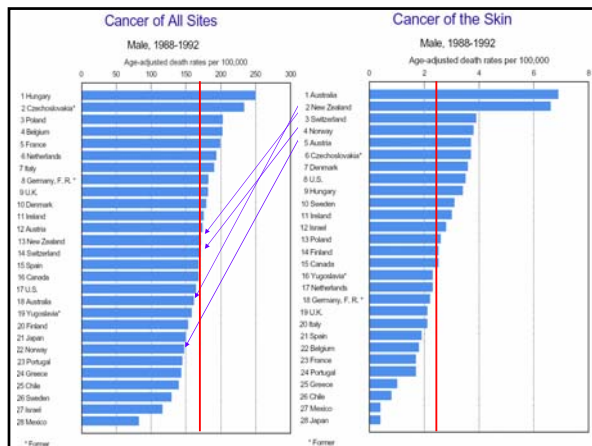


Cancer of the Skin

Male, 1988-1992

Age-adjusted death rates per 100,000



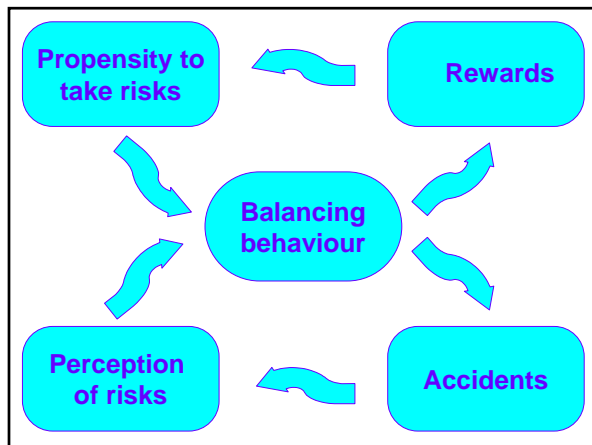


A successful risk manager



Risk management is

- a balancing act
- instinctive
- intuitive
- modified by culture



Risk compensation more dangerous & therefore slower

Groovy, but drivers are unimpressed



Bottom loop bias



Risk perceived through science the role of the Royal Statistical society

- "a Richter scale for risk would involve taking a series of common situations of varying risk to which people can relate" (DoT)
- "a simple measure of risk that people can use as a basis for decision making" (RSS)

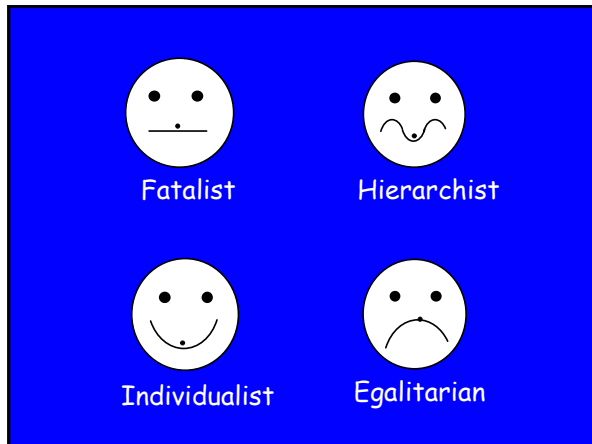


Table 1. Risk of an individual dying (D) in any one year or developing an adverse response (A)

Term used	Risk estimate	Example	
High	Greater than 1:100	A. Transmission to susceptible household contacts of measles and chickenpox	1:1 - 1:2
		A. Transmission of HIV from Mother to child (Europe)	1:6
Moderate	Between 1:100-1:1000	A. Gastro-intestinal effects of antibiotics	1:10 - 1:20
		D. Smoking 10 cigarettes per day	1:200
Low	Between 1:1000- 1:10000	D. All natural causes, age 40 years	1:850
		D. All kinds of violence and poisoning	1:3300
		D. Influenza	1:5000
		D. Accident on road	1:8000
Very low	Between 1:10000- 1:100000	D. Leukaemia	1:12000
		D. Playing soccer	1:25000
		D. Accident at home	1:26000
		D. Accident at work	1:43000
		D. Homicide	1:100000
Minimal	Between 1:100000- 1:1000000	D. Accident on railway	1:500000
		A. Vaccination-associated polio	1:1000000
Negligible	Less than 1:10000000	D. Hit by lightning	1:10000000
		D. Release of radiation by nuclear power station	1:10000000

Source: *On the State of the Public Health: the Annual Report of the Chief Medical Officer of the Department of Health for the Year 1995*, London, HMSO, 1996, p. 13.

A Richter Scale for Risk?

Risk of an individual dying in any one year as a result of a road accident

= 1:8000 (*On the State of the Public Health 1995*)

= 1:16000 (*Road Accidents Great Britain 1995*)

Young male vs middle-aged female

Personality disorder vs normal

3am Sunday vs 10am Sunday

2.5 times over limit vs sober

100 X 134 X 10 X 20 = 2 680 000

- I exaggerate**
the four variables are not independent;
there are more disturbed drunken young men on the road at 3am Sunday
- or do I?**
the four numbers in the equation are all *averages*.
Further variables must be invoked to account for their variances,
is the car
big X new X equipped with ABS brakes X insured ...?
is the road
slippery X well-lit X straight ... ?
is the driver
sleepy X angry X on drugs X short-sighted ...?
is the ?

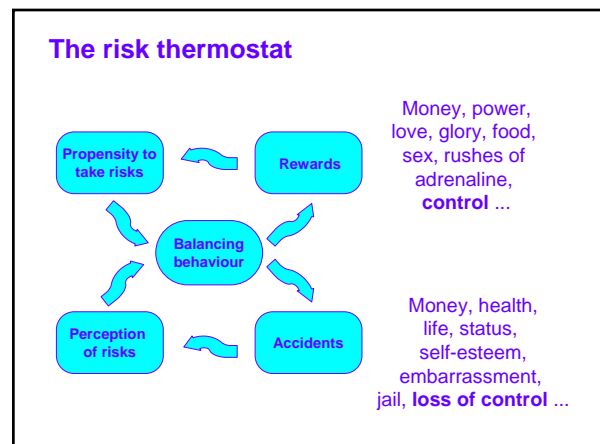
"evidence of decreasing cancer risks with increasing radon concentrations was observed"
British Journal of Cancer (2002, 86, 1721-1726)

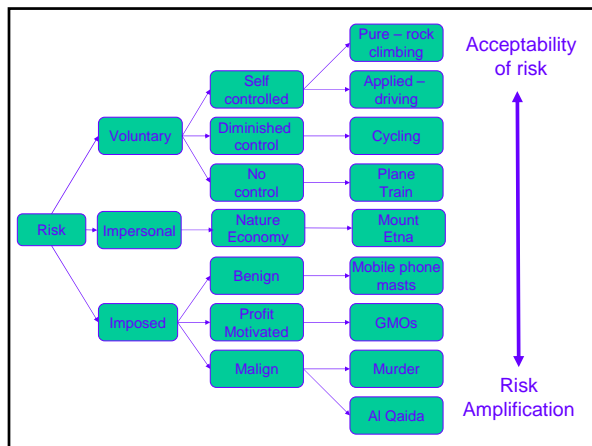
Home radon cleared of cancer risk to children

hormesis

Paracelsus (more than 400 years ago):
"All substances are poisons, there is none which is not a poison. The right dose differentiates a poison from a remedy."

10⁻¹⁰
0.01



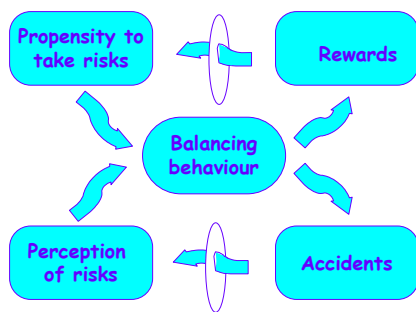


A virtual risk: vCJD from BSE?

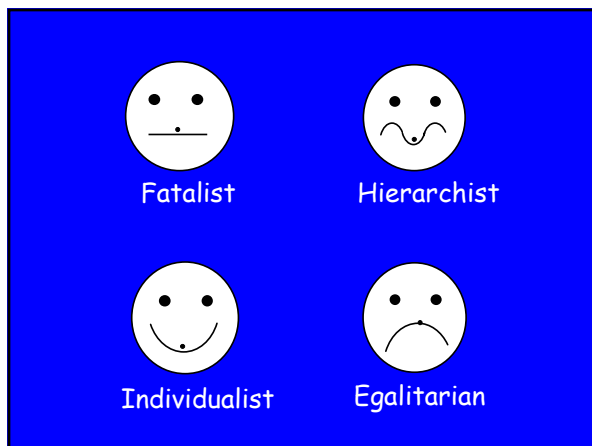
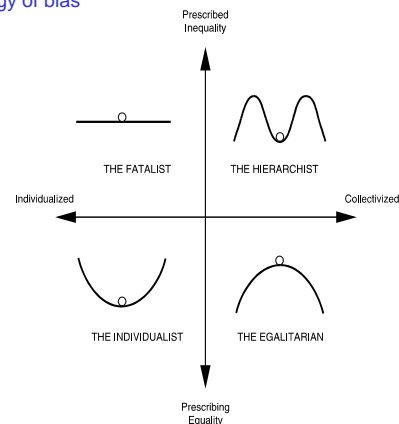
"I have worked in this field for 25 years ... did I go out and eat lamb chops, did I go out and eat lamb brain, sheep brain? The answer was 'no', but it was not based on scientific criteria, it was based on just emotion. ... At a scientific level I cannot give you a scientific basis for choosing or not choosing beef, because we do not know the answers."

*Nobel Laureate Stanley Prusiner
BSE Inquiry, 6 June 1998*

Perceptual Filters



A typology of bias



Egalitarian

- Feeding dead sheep to cattle, or dead cattle to sheep, is "unnatural" and "perverted".
- "It is the full story of the beginnings of an apocalyptic phenomenon."
- "Great epidemics are warning signs, symptoms of disease in society itself."



Individualist

- “The precautionary principle is favoured by environmental extremists and health fanatics. They feed off the lack of scientific evidence and use it to promote fear of the unknown.”
- “It is clear to all of us who believe in the invisible hand of the market place that interference by the calamity-promoting pushers of the precautionary principle is not only hurtful but unnecessary.”



Hierarchist

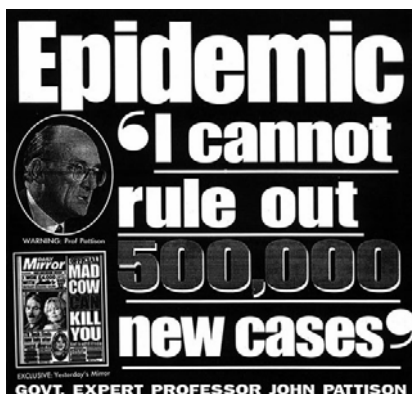
- “We require public policy to be in the hands of elected politicians. Passing responsibility to scientists can only undermine confidence in politics and science.”
- “I have not got a scientific opinion worth listening to. My job is simply to make certain that the evidence is drawn to the attention of the public and the Government does what we are told is necessary.”



Fatalist

“They should shoot the scientists, not cull the calves. Nobody seems to know what is going on.”

- “**Charles won't pay for Diana's briefs**”
Main headline in *The Sun* on 21.3.96, the day every other newspaper in the country led with the BSE story



REFERRALS OF SUSPECT CJD		DEATHS OF DEFINITE AND PROBABLE CJD						
Year	Referrals	Year	Sporadic	Iatrogenic	Familial	GSS	vCJD	Total Deaths
1990	[53]	1990	28	5	0	0	-	33
1991	75	1991	32	1	3	0	-	36
1992	96	1992	45	2	5	1	-	53
1993	78	1993	37	4	3	2	-	46
1994	118	1994	53	1	4	3	-	61
1995	87	1995	35	4	2	3	3	47
1996	133	1996	40	4	2	4	10	60
1997	162	1997	60	6	4	1	10	81
1998	154	1998	63	3	3	2	18	89
1999	170	1999	62	6	2	0	15	85
2000	178	2000	50	1	2	1	28	82
2001	179	2001	58	4	3	2	20	87
2002	163	2002	72	0	4	1	17	94
2003	162	2003	77	5	4	2	18	106
2004	144	2004	58	2	2	1	6	69

Number of Deaths			
Time	World	UK	
Year	54,997,000	612,000	UK – vCJD 8.3
Month	4,583,000	51,000	
Week	1,058,000	11,737	
Day	151,090	1,677	
Hour	6,300	70	Sars – Global 774
Minute	105	1.2	UK - 0

Staff based at the National CJD Surveillance Unit, Western General Hospital, Edinburgh in 2004

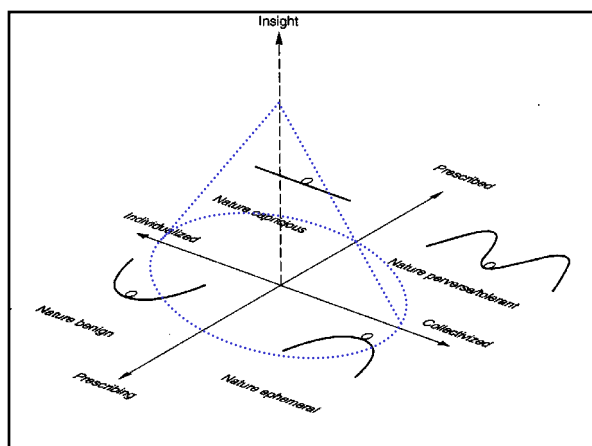
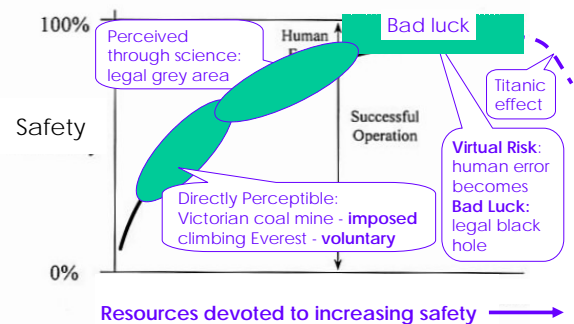
Professor JF Scolding
 Professor EG Wilt
 Dr BSG Knight
 Professor JE Bell, Dr C Smith
 Dr H Ward
 Dr C Heath, Dr K Mowbray
 Mr B Smith-Burgess
 Mr M Lamb
 Mr G McLean, Mr P Bannister
 Dr MFF Head
 Dr A Green
 Mr M Bishop
 Mr J MacIntyre
 Mr A House
 Mr D Erskine
 Mr N Armstrong
 Mr D Rankin
 Mr S MacGillivray
 Mr M La Greca, Mr S Lammie, Mr M Steel
 Mr C MacIntyre
 Mr H Vail
 Mr C Goodall
 Mr N Connolly
 Mr S Wright
 Mr V McLaughlin
 Mr B Kermack
 Mr P Lennan
 Dr M Jones
 Mr G Fraser
 Mr R Fraser, Mr A Housman
 Mr S Smith, Mr A Roberts
 Mr S Macdonald
 Mr A Davies, Mr K Sewell
 Staff funded by Orlan Science
 Mr T Lander (EU)
 Mr C Davidson (EU)
 Mr T Page (CSO)
 Dr A Preece (EU)

13th Annual Report, National CJS Surveillance Unit
<http://www.cjd.ed.ac.uk/report13.pdf>

Creutzfeldt-Jacob Disease Surveillance in the UK 8th Annual Report 1999 (published November 2000)

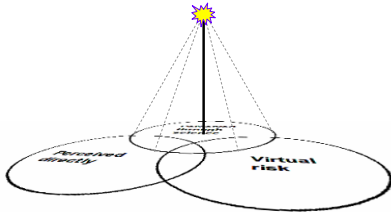
- Over the last 13 years 108 confirmed cases of vCJD, plus 43 "probable"
- "Statistical analysis has provided no evidence ... that the rate of occurrence of new cases (of vCJD) has increased with time since 1994."
- "We have found no evidence of any dietary, iatrogenic or occupational risk for vCJD."

The Human Reliability Curve



Managing risk:
 it's not rocket science
 it's more complicated

Terrorism: searching for the keys



Compulsive Risk Assessment Disorder

psychosis - a severe mental disorder in which contact with reality is lost or highly distorted.

Compulsive Risk Assessment Psychosis

"The board should maintain a sound system of internal control"

"[the annual] review should cover **all** controls, including ... **risk management**"

"no prescribed form or content"

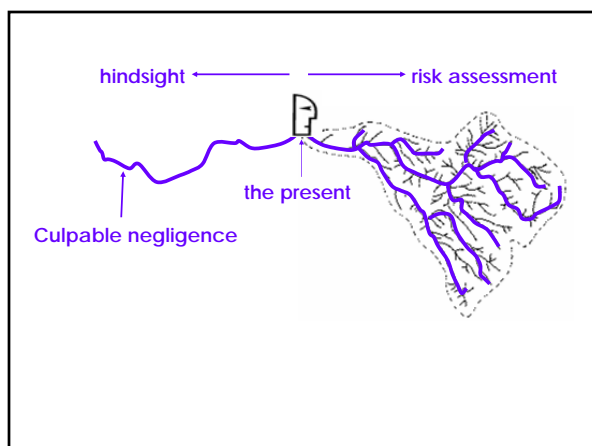
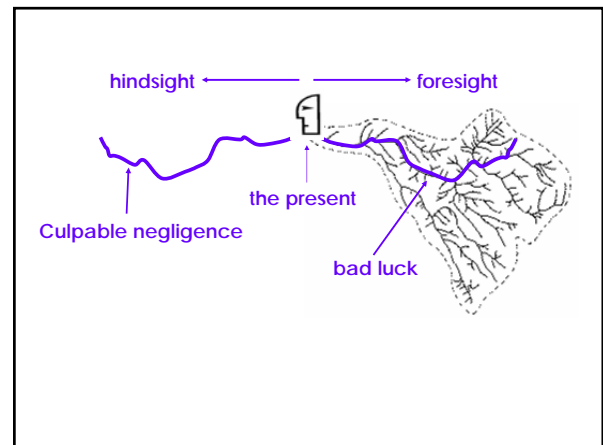
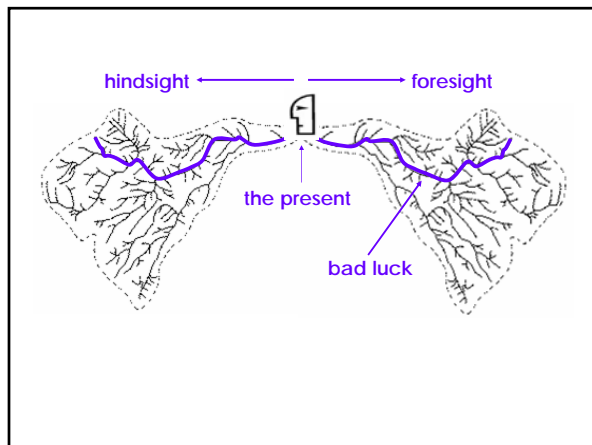
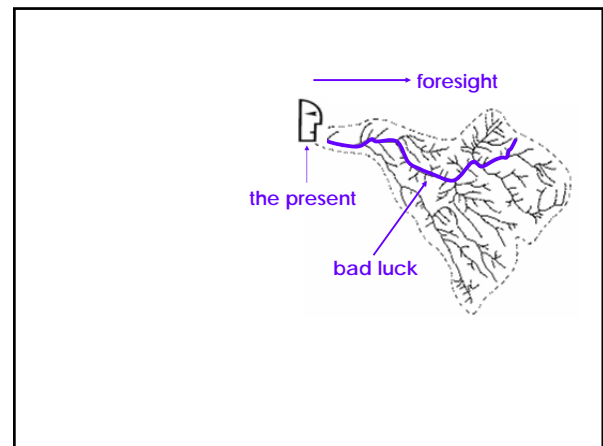
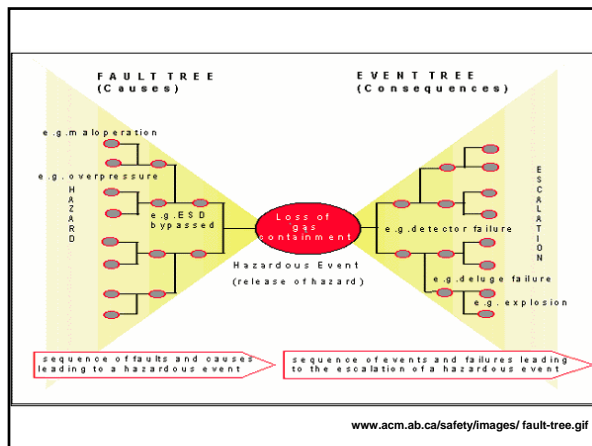
"risk based"

"the risks [the company] faces are continually changing"

"effective monitoring on a continuous basis"

"the board should ... Ensure that it has considered **all** significant aspects of internal control"

"**All** employees have some responsibility for internal control"



Drake	Clapperton	Livingstone
Gilbert	Barrow	Baker
Saxton	Lander	Kirk
Davis	Parry	Godwin -
Hakluyt	Colby	Austen
Wright	Back	Clarke
Hudson	Ross	Markham
Baffin	Biscoe	Yule
Halley	Franklin	Stanley
Dampier	Stuart	Doughty
Bruce	Eyre	Thomson
Cook	Galton	Murray
Ramsden	Everest	Curzon
Roy	Hooker	Scott
Mackenzie	Bates	Shackleton
Rennell	Burton	Keltie
Vancouver	Speke	Gertrude Bell
Park	Murchison	Hogarth

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Introduction to Risk Assessment - Microsoft Internet Explorer

Address: http://www.geog.uct.ac.uk/safety/risk/

Risk assessment of all activities is required by law.

Department of Geography Safety Pages > Introduction to Risk Assessment For Field Work

Please read this section first, then go to the [Main Hazard Index](#)

Risk Assessment

A risk assessment is simply a careful examination of anything that may cause harm to you or others during the course of your work. Once this is done, you will then be able to decide upon the most appropriate action to take to minimize the likelihood of anyone being hurt. The aim is to prevent accident and illness. It is carried out by identifying risk and using appropriate control measures to minimize or eliminate the risk. **Risk Assessment of all activities is required by Law.**

Hazard

A hazard is anything that may cause harm. Although they may not cause harm in one form, there is always a "what if...?". Glass bottles can be considered a hazard. Normally they are fairly harmless - what if they are dropped? Electricity is a hazard. Whilst properly contained it is safe, what if...? To make life a little easier, we have divided the hazards into groups. These are then subdivided. Not all the areas will be relevant to your work, but do not dismiss them without looking - You may find a risk that you hadn't thought of!

Risk

You may find a risk that you hadn't thought of!

Risk Assessments for Field Work - Microsoft Internet Explorer

Address: http://www.geog.uct.ac.uk/safety/risk/haz_ind.htm

Guide to Hazard Categories

- Environment
- Manual Handling
- Chemical/Biological
- Working on or near Water
- Lone/Out of hours working
- Health
- Equipment
- Dealing with the Public

Returns to [Introduction to Risk Assessment](#)

Risk Assessments for Field Work - Environmental Hazards - Microsoft Internet Explorer

Address: http://www.geog.uct.ac.uk/safety/risk/env_haz.htm

Risk Assessment > Environment

- Weather
- Terrain
- Location
- District
- Animals
- Pollution

Returns to [main hazard index](#)

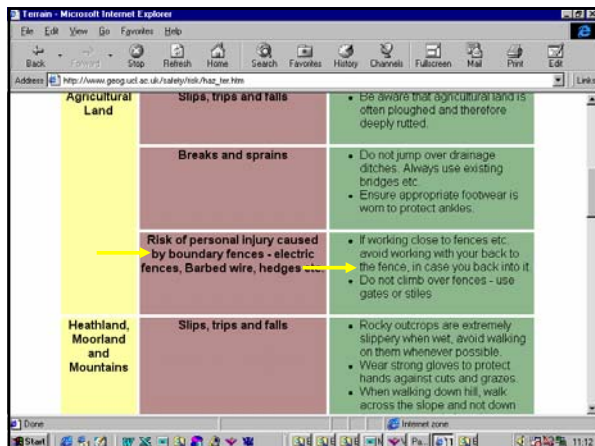
Department of Geography

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Terrain - Microsoft Internet Explorer

Address: http://www.geog.uct.ac.uk/safety/risk/haz_ind.htm

Terrain types	Risks	Associated Control Measures
General	Slips, trips and falls - Due to "wrong footing" on uneven or wet/slippery ground.	<ul style="list-style-type: none"> • Wear footwear suitable for the conditions. • Plan route carefully to avoid most uneven ground. • Ensure you can see where you are putting your feet before walking. • Avoid working in poor light conditions.
	Back and neck injuries - Due to jarring spine etc. This can also lead to skull fractures.	<ul style="list-style-type: none"> • Do not jump over or off anything. If there is a drop or ditch that has to be negotiated, lower yourself slowly or use existing bridges, steps etc. • Be aware that landing "heavily", thus jarring the spine, can lead to basal fractures of the skull or concussion. In the event of such an injury, medical attention must be sought immediately.

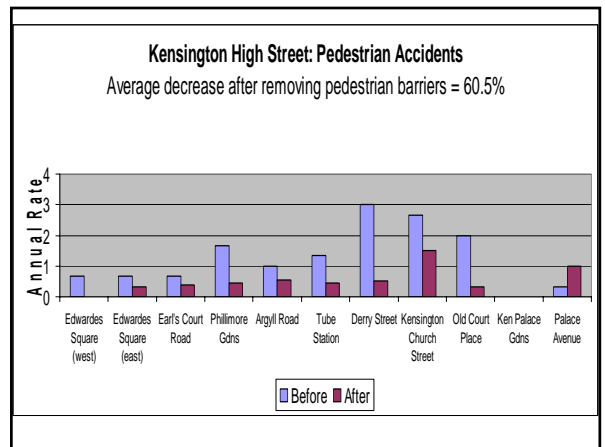


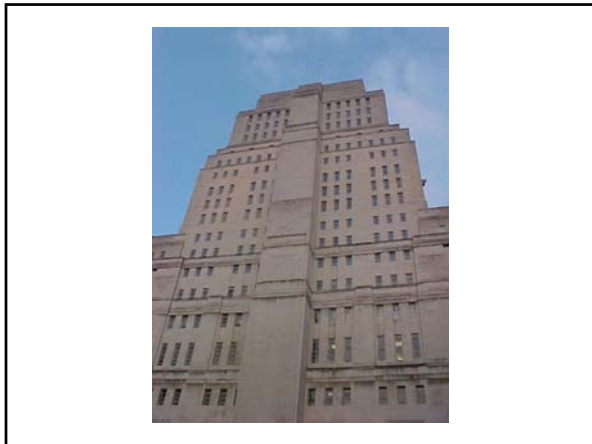
Prime Minister's speech to IPPR, 26 May 2005

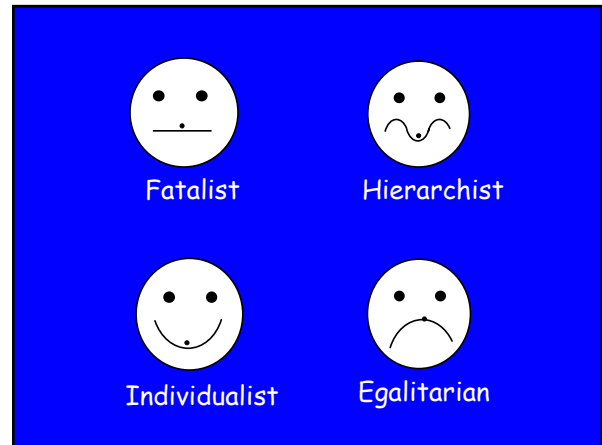
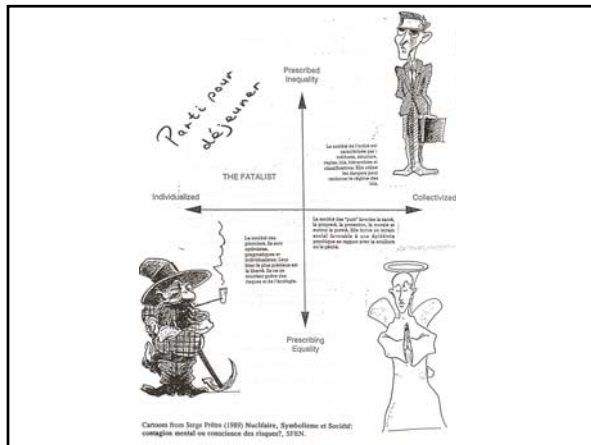
I call [for] a sensible debate about risk in public policy making. In my view, **we are in danger of having a wholly disproportionate attitude to the risks we should expect to run as a normal part of life.** This is putting pressure on policy-making, not just in Government but in regulatory bodies, on local government, public services, in Europe and across parts of the private sector - to act to eliminate risk in a way that is out of all proportion to the potential damage. The result is a plethora of rules, guidelines, responses to 'scandals' of one nature or another that ends up having utterly perverse consequences.

1. Handling risk should be **firmly embedded** in government's policy making, planning and delivery.
2. Government's capacity to handle strategic risks should be **enhanced**.
3. Risk handling should be supported by **good practice**, guidance and skills development.
4. Departments and agencies should make earning and **maintaining public trust** a priority when dealing with risks to the public.
5. Ministers and senior officials should take a clear lead in **improving risk handling**.
6. The quality of government risk management should be **improved** through a two-year programme of change, linked to the Spending Review timetable, and clearly set in the context of public sector reform.









References
www.geog.ucl.ac.uk/~jadams/publish.htm