

An iceberg floating in the ocean. The tip of the iceberg is above the water surface, and the much larger part of the iceberg is submerged below the surface. The sky is blue with light clouds, and the water is a deep blue. The overall image serves as a metaphor for communication, where the visible part is just the tip of the iceberg, and the much larger part is hidden below the surface.

Communication

**Risk communication:  
how to make it ethical  
and effective**

STRATEGY

**Luca Carra, Zadig, Milano  
Modena  
May, 15th, 2014**



# COMMUNICATION ON ENVIRONMENTAL & HEALTH DATA AND OUTRAGE FACTOR

# The variability of Risk perception



“Public reaction to risk often appear to be at odds with scientific estimates. Although risk may technically be defined as 'probability *times* severity of harm', the suggestion that a hazard poses an annual risk of death of 'one chance in x' may cause anything from near panic to virtual indifference”.

*Bennet, 2010*

# Risk and the OUTRAGE factor



$$\mathbf{R = H + O}$$

R = perceived risk

H (*hazard*) = the way a scientist measures the risk

O (*outrage*) = the so-called *outrage factor*

Sandman, 1987

# **R = H + O What is outrage**



“Let’s divide the risk people are worried about into two components. The **technical side** of the risk focuses on the magnitude and probability of undesirable outcomes: an increase in the cancer rate, a catastrophic accident, dead fish in the river, even a decline in property values. Call all this **hazard**.

The non-technical side of the risk focuses on everything negative about the situation itself (as opposed to those outcomes) Is it voluntary or coerced familiar or exotic

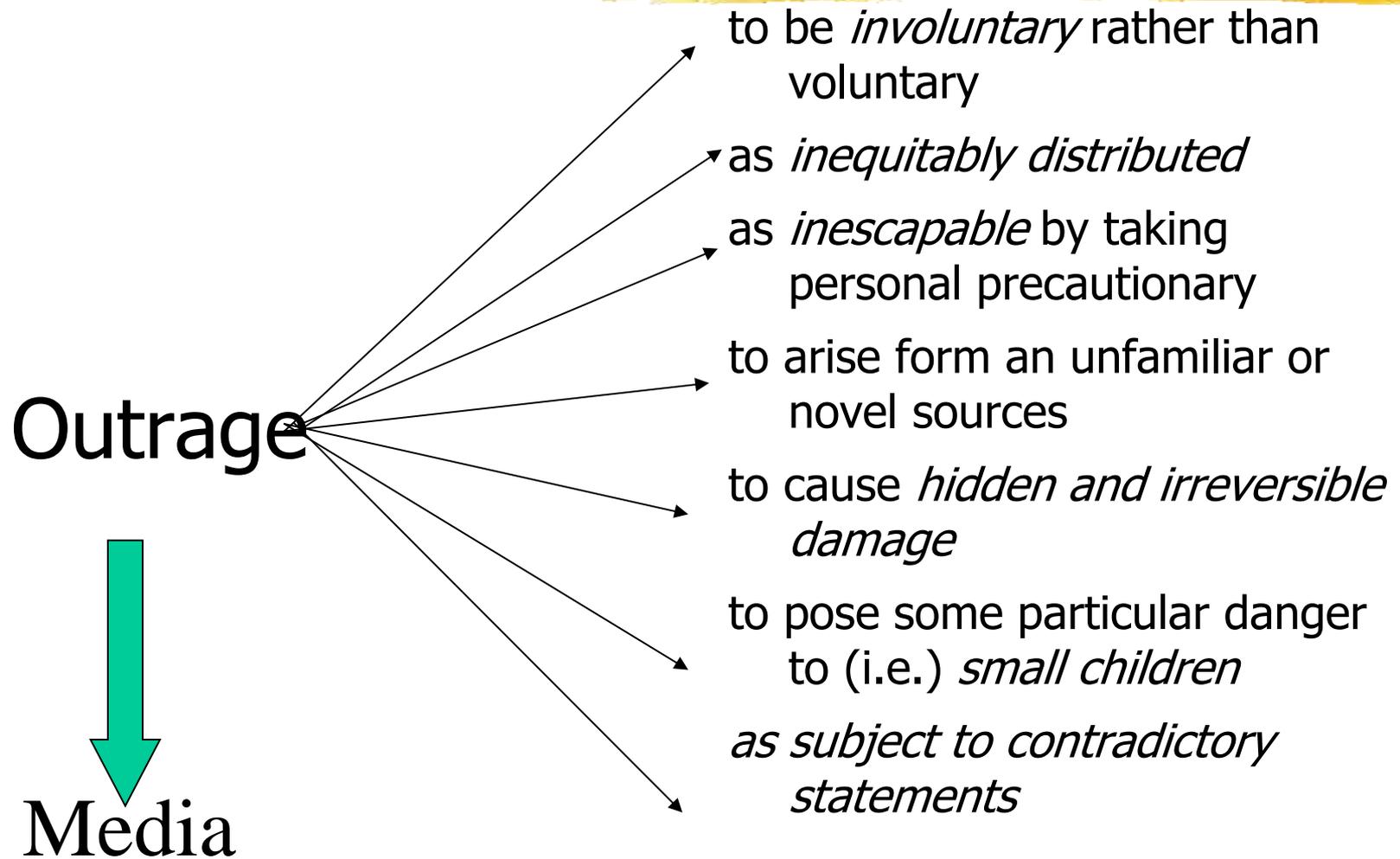
# Acceptance/Refusal of risk



- **Misjudging risks**

“We tend to consider rare but dramatic events to be grater hazards than the familiar risks that we face every day. Furthermore, our tolerance is greater for risks that we ourseleves have decided to take than for those that are imposed on us by others”.(Bennett, 2011)

# Risks are more worrying if perceived:



# Outrage drives reputation (and trigger the media)



The main media triggers, that can fuel outrage factor, are the following:

1. Questions of *blame*
2. Alleged *secrets* and attempted *cover-ups*
3. *Human interest* through identifiable heroes, villains, dupes, etc.
4. Links with existing high-profile issues or *personalities*
5. *Conflict*
6. *Signal value*: the story as a portent of further ills (“What next?”)
7. *Many people exposed* (“It could be you!”)
8. Strong *visual impact*
9. Links to *sex* and/or *crime*

# **Mechanism of Media coverage in health topics**



⌘ **Hyping the problem**

(exaggerated **data**)

⌘ **Stirring up fears**

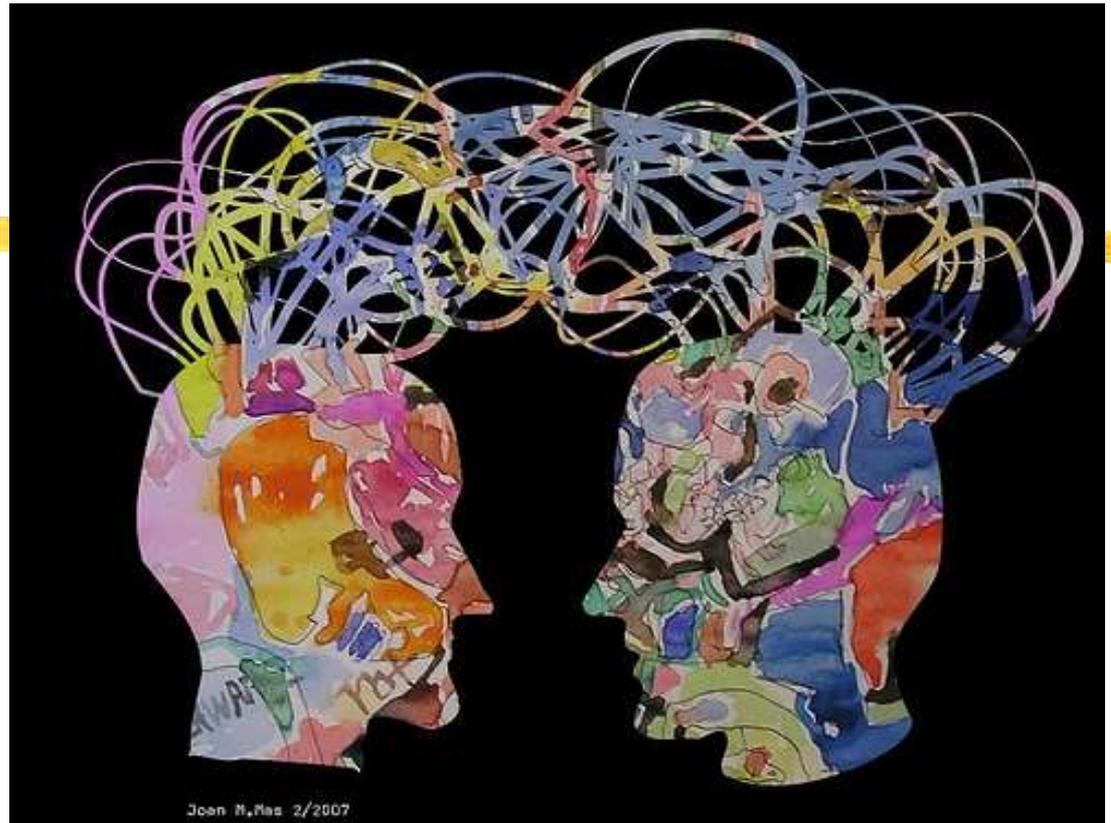
(risk over-evaluation)

⌘ **Inducing to exams**

(medicalization)

⌘ **Banalizing solutions**

(drugs ecc.)



**SOME TIP ON GOOD  
COMMUNICATION**

# Nature and goals of risk communication



**Risk communication** is an interactive process of exchange of information (data) and opinion on risk among risk assessors, risk managers, policy makers and the public. It is most effective when integrated with risk analysis and risk management and **requires the involvement of stakeholders.**

Problems for risk communicators involve how to reach the intended audience, to make the risk comprehensible and relatable to other risks, how to pay appropriate attention to the audience's values related to the risk, how to predict the

# EPA rules



The U.S. Environmental Protection Agency expressed seven cardinal rules for the practice of Environmental Health Communication:

- accept and involve the public/other consumers as legitimate partners (e.g. stakeholders);
- plan carefully and evaluate your efforts with a focus on your strengths, weaknesses, opportunities, and threats (SWOT);
- listen to the stakeholders specific concerns;
- be honest, frank, and open;
- coordinate and collaborate with other credible sources;
- meet the needs of the media;

# How to manage risk communication?



$$R = \frac{H + O}{M + T + P}$$

*where:*

M = Monitoring capacity

T = Trasparent communication, openness,

P = Participation of the stakeholders

# H + T + P



When referring to media, **Transparency** is the concept of determining how and why information is conveyed through various means. In government, transparency is the capability to put in place national communication guidelines on the public announcements and to keep the flow of information constantly updated. Transparency contributes to a better dissemination of information, which in turn assists producing greater knowledge and social progress. Particularly, by strengthening trust in the institutions, it can be of great help when dealing with risk communication.

**Monitoring** is equally important, and refers to the capacity by the Public Authorities (but also by some stakeholders) of collecting and disseminating all sorts of Data relevant for the environmental public health (health statistics, emissions, radiations, contaminations). This can greatly increase trust, empower people and reduce fright factor. Good examples of that in Italy are Monitor project, Sentieri project, EpiAir and so on (*see other lectures*).

Stakeholders involvement (**Participation**) is crucial as well. People have the right to express their opinions, choices and concerns and to be seriously heard and taken into consideration in the risk assessment and management. Stakeholders are those public and private groups that have active concerns about environmental and public health issues. Nowadays, these groups are usually involved in the decision-making process and may influence knowledge and attitudes towards best solutions. Also, they can bring some sort of resource to bear in support of public health communication. Their importance when dealing with environmental and public health governance is vital and their engagement represents the opportunity to build trust and partnerships, discuss and agree

# **The importance of data (monitoring)**

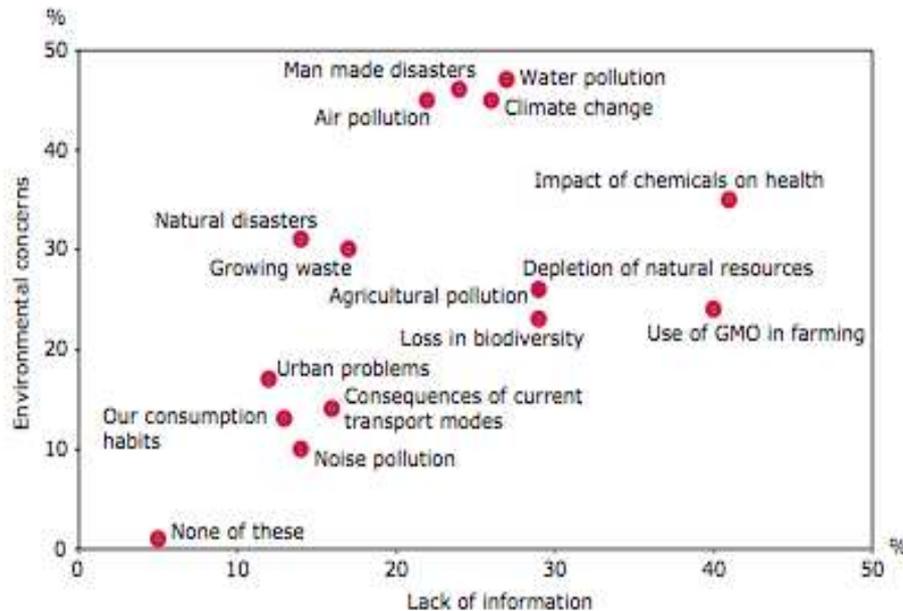


Environmental Health Data monitoring can give a sense of control over the situation and can increase the empowerment of stakeholders and trust in health authorities.

"The opinion of the public on a particular risk becomes a judgment on the quality of the procedures for monitoring and managing risk by regulatory agencies and other stakeholders" (Bennett, 2011)

# Concerns and lack of data

**Figure 1.2** Comparison between environmental concerns and lack of information Europeans have



Source: Eurobarometer 217, 2005.

# Public understanding of Data



This is a long process, in which Data delivery to the public must be accompanied by a process of capacity building in the field of Data understanding

But... communication is rapidly changing from one to bi-directional mood.

# The advent of social media



Until recently the predominant communication model was “one” authority to “many” – i.e. a health institution, the ministry of health or a journalist communicating to the public. Social media has changed the monologue to a dialogue, where anyone with ICT access can be a content creator and communicator.”

(McNab, 2009)

# Apomediation

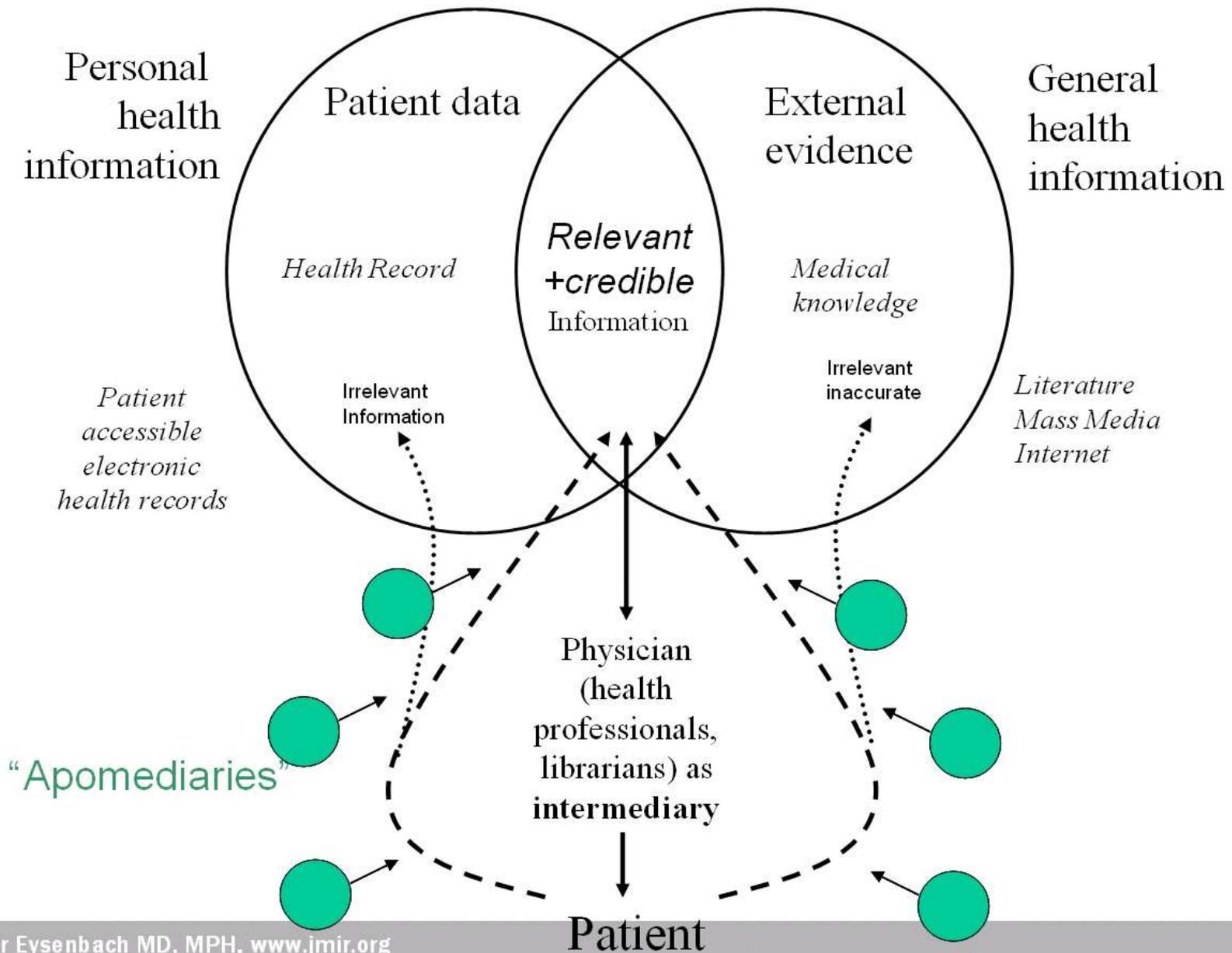


We are facing also the passage from the **intermediation** to the **apomediation** model (web 2.0).

“Apomediation is an information seeking strategy where people rely less on traditional experts and authorities as gatekeepers, but instead receive guidance from ... agents which stand-by (*latin: apo- means separate, detached, away from*) ... to guide a consumer to high quality information and services without being a prerequisite to obtain that information or service in the first place, and with limited individual power to alter or select the information being brokered”

(Eysenbach, 2008)

# Disintermediation / Apomediation



# Open Data & Citizen Science



**Open Data:** Open data is the idea that certain [data](#) should be freely available to everyone to use and republish as they wish, without restrictions from [copyright](#), [patents](#) or other mechanisms of control. The goals of the open data movement are similar to those of other "Open" movements such as [open source](#), [open hardware](#), [open content](#), and [open access](#). (*Wikipedia*)

**Citizen Science:** Formally, citizen science has been defined as "the systematic collection and analysis of data; development of technology; testing of natural phenomena; and the dissemination of these activities by researchers on a primarily advocational basis". Citizen science is sometimes called "public participation in scientific research". (*Wikipedia*)

# Horizon 2020 and Citizen Science



“With the aim of deepening the relationship between science and society and reinforcing public confidence in science, Horizon 2020 should favour an informed engagement of citizens and civil society on research and innovation matters by promoting science education, by making scientific knowledge more accessible, by developing responsible research and innovation agendas that meet citizens' and civil society's concerns and expectations and by facilitating their participation in Horizon 2020 activities”.

*(European Commission 2013)*

# Citizen Science in... botany

Data collected by citizen scientists can be integrated with other data, such as morphological, molecular, etc. As a result, it is possible to produce new integrated resources

OPEN ACCESS Freely available online

 PLOS ONE

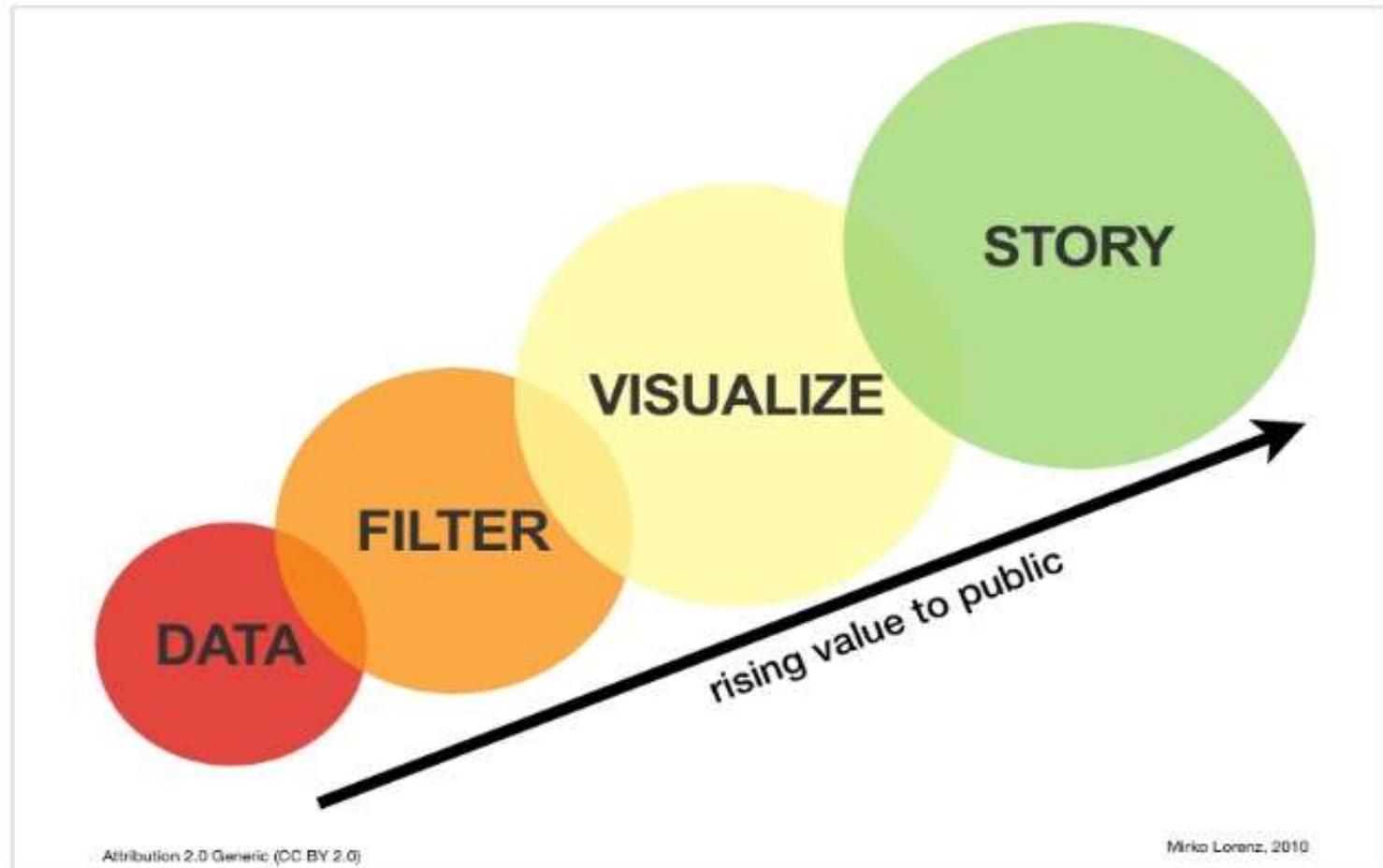
## DNA Barcoding as an Effective Tool in Improving a Digital Plant Identification System: A Case Study for the Area of Mt. Valerio, Trieste (NE Italy)

**Ilaria Bruni<sup>1</sup>, Fabrizio De Mattia<sup>1</sup>, Stefano Martellos<sup>2</sup>, Andrea Galimberti<sup>1</sup>, Paolo Savadori<sup>1</sup>, Maurizio Casiraghi<sup>1</sup>, Pier Luigi Nimis<sup>2</sup>, Massimo Labra<sup>1\*</sup>**

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# Make the data "intelligent"

DATA-DRIVEN JOURNALISM = PROCESS



# Impact of visual information on Human Brain

*Publishing visualizations on websites, making them freely available for others to use, sharing them with you, and hoping you share them with others.*

*45% more web users will click on a link if it features an infographic*



*30% of those will forward it even if the information is pointless*



*40 % of people respond better to visual information than text*



*90% of information that comes to the brain is visual*

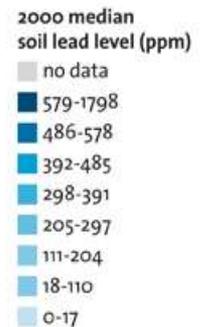


# Comparing data on the map



Sources: Howard Mielke, US Census

Mother Jones



Sources: Howard Mielke, US Census

Mother Jones

# Searchable maps

**Emitter**<sup>BETA</sup>

Tracking pollution in your neighbourhood

 Tweet 238

[ABOUT](#) [METHODOLOGY](#) [DEVELOPER](#)

 NEARBY  CITY  RIDING

Ottawa

Search



51 Results found while Searching

SEARCH:

# Health Intelligence in Lombardy



ASL Milano 1

*Benvenuti nel sito dedicato allo studio dello stato di salute della popolazione della ASL Milano I.*

**S**ono possibili diversi livelli di consultazione dei dati relativi alla salute degli assistiti (ricoveri, registro tumori, patologie croniche, decessi) illustrati di seguito:

- 1** Cliccando sull'**area della ASL** nella cartina della Lombardia si accede direttamente alle mappe dinamiche
- 2** Cliccando su **richiesta dati** si possono avere a disposizione le tabelle scaricabili in foglio di calcolo per i dati richiesti
- 3** Cliccando su **mappe dinamiche** c'è la possibilità di avere in tempo reale i dati per singolo comune e il confronto con gli altri comuni
- 4** Cliccando su **mappe statiche** si possono scaricare mappe preconfezionate sulla base dell'indicatore richiesto
- 5** Cliccando su **report** si possono scaricare in formato pdf i report dello Stato di Salute della ASL
- 6** Cliccando su **atlante** si possono

## STATO DI SALUTE DELLA POPOLAZIONE

chi siamo

richiesta dati

mappe dinamiche

mappe statiche

report

atlante



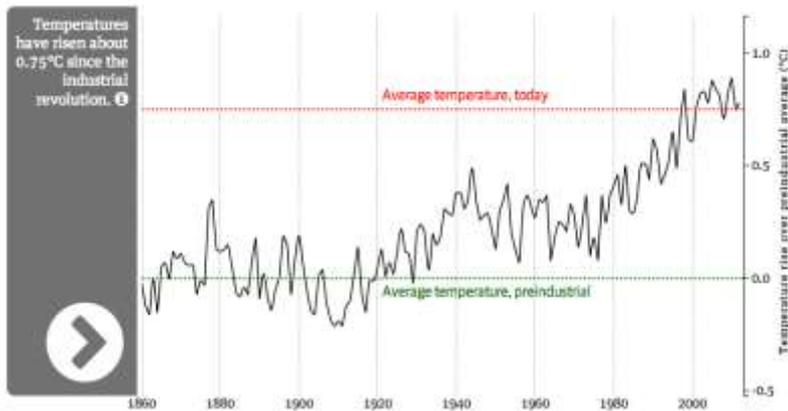
# Personalizing data

## Climate change: how hot will it get in my lifetime? - interactive

The UN is to publish the most exhaustive examination of climate change science to date, predicting dangerous temperature rises. How hot will it get in your lifetime? Find out with our interactive guide, which shows projections based on the report.

Share 13031  
Tweet 6,571  
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Duncan Clark  
theguardian.com, Friday 27 September 2013 09:01 BST



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# An useful source

**Regions for Health Network**

**World Health Organization**  
REGIONAL OFFICE FOR Europe

Public administrations at all levels must often manage complex situations related to environmental determinants of health, often surrounded by controversy. Many factors contribute to a rapid escalation of those situations: increased sensitivity in the face of uncertain risks, uneven distribution of risks and benefits, and decreasing trust in authorities and entities involved in making decisions influencing public health. There is a need, in such circumstances, to assess the extent of possible health and environment impacts and to manage information, evidence and communication on possible risks, while understanding and taking into consideration the opinions, interests and values of the relevant stakeholders.

A workshop, jointly organized by the WHO European Office for Investment for Health and Development in Venice and the WHO European Centre for Environment and Health in Bonn, was held in Trento, Italy with the aim of sharing experiences in the management and communication of environmental risks.

This report builds on the presentations and discussions from the workshop and presents a series of key messages useful to regional and local authorities, as well as to risk managers in general.

World Health Organization  
Regional Office for Europe  
UN City, Marmorvej 51, DK-2100 Copenhagen Ø, Denmark  
Tel.: +45 45 33 70 00 Fax: +45 45 33 70 01  
Email: [contact@euro.who.int](mailto:contact@euro.who.int)  
Website: [www.euro.who.int](http://www.euro.who.int)

**Health and environment:  
communicating  
the risks**

9 789289 000512

# Risk comparison



- “Compare risks can seriously damage your credibility” (Covello, 1988)
- In any case, never compare non-homogeneous risks.

P. Sandman, 2011

# Risk comparison

Table B.7  
Average Risk of Death from Various  
Human-Caused and Natural Accidents

Type of Event	Probability of 100 or More Fatalities	Probability of 1,000 or More Fatalities
<b>Human-caused</b>		
Airplane Crash	1 in 2,000 yrs.	1 in 2 yrs.
Fire	1 in 200 yrs.	1 in 7 yrs.
Explosion	1 in 120 yrs.	1 in 16 yrs.
Toxic Gas	1 in 1,000 yrs.	1 in 100 yrs.
<b>Natural</b>		
Tornado	very small	1 in 5 yrs.
Hurricane	1 in 25 yrs.	1 in 5 yrs.
Earthquake	1 in 50 yrs.	1 in 20 yrs.
Meteorite Impact	1 in 1 million yrs.	1 in 100,000 yrs.

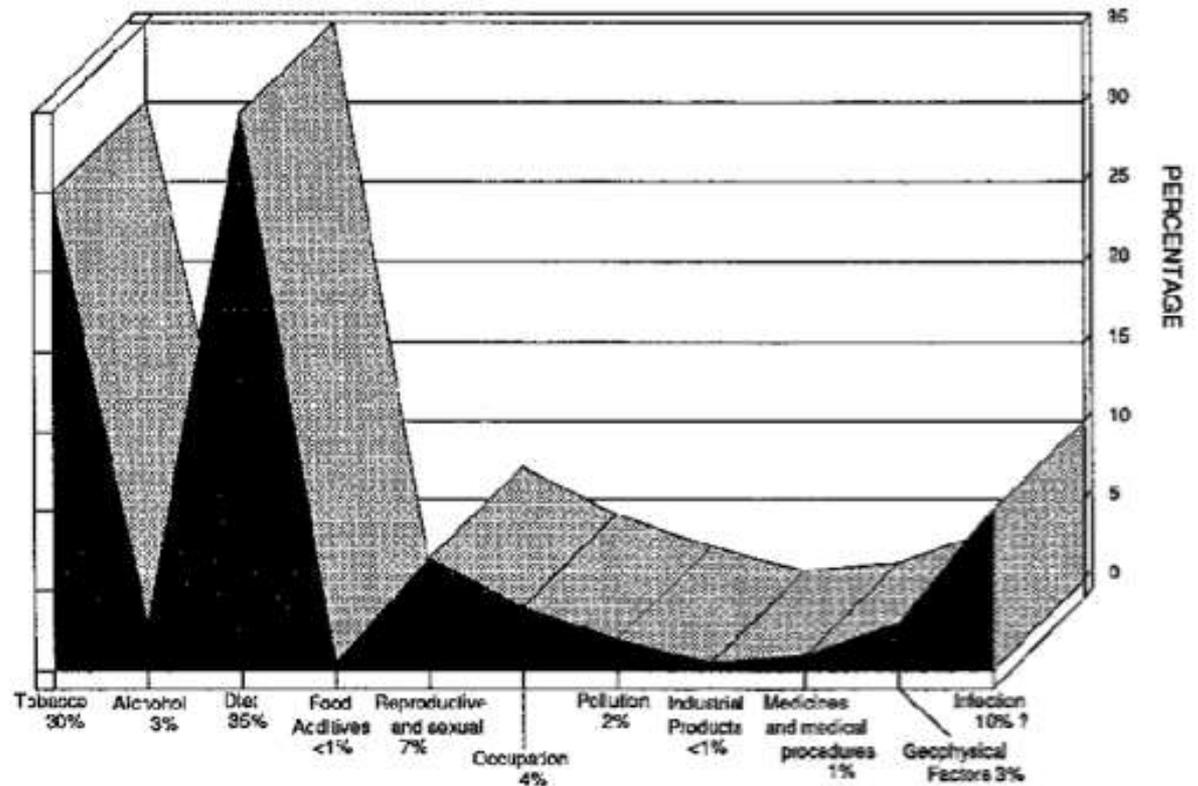
Source: Nuclear Regulatory Commission, *Reactor Safety Study*, WASH-1400 (NUREG/74/104), Washington, D.C., 1975.

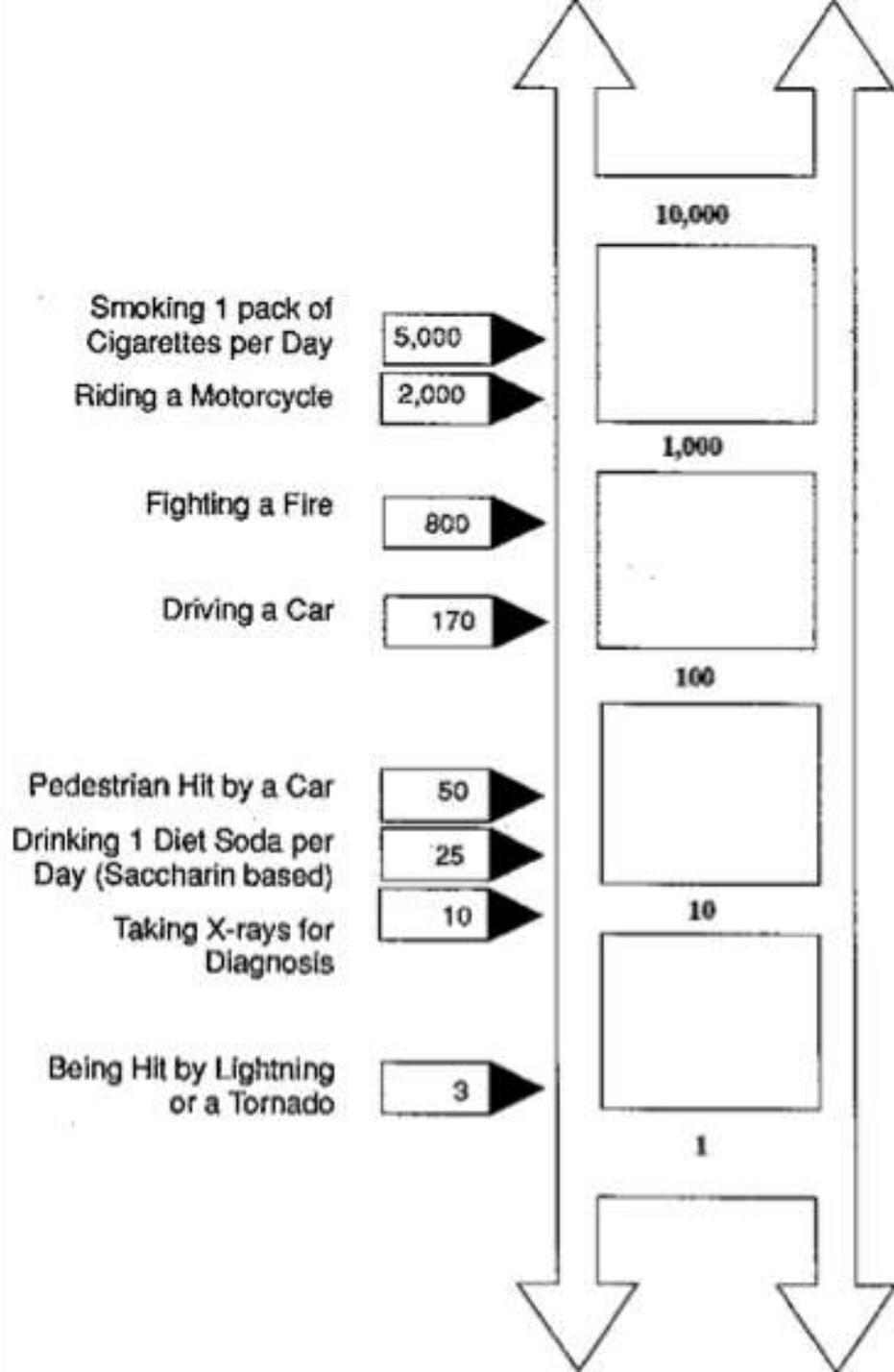
**Table B.4**  
**Estimated Loss of Life Expectancy**  
**Due to Various Causes**

<b>Cause</b>	<b>Days</b>	<b>Cause</b>	<b>Days</b>
Cigarette smoking (male)	2250	Job with radiation exposure	40
Heart disease	2100	Falls	39
Being 30% overweight	1300	Accidents to Pedestrians	37
Being a coal miner	1100	Safest job (accidents)	30
Cancer	980	Fire (burns)	27
Being 20% Overweight	900	Generation of energy	24
Cigarette smoking (female)	800	Illicit drugs (U.S. average)	18
Stroke	520	Poison (solid, liquid)	17
Living in unfavorable state	500	Suffocation	13
Cigar smoking	330	Firearms accidents	11
Dangerous job (accidents)	300	Natural radiation	8
Pipe smoking	220	Poisonous gases	7
Increasing food intake 100 calories/day	210	Medical X rays	6
Motor vehicle accidents	207	Coffee	6
Pneumonia (influenza)	141	Oral contraceptives	5
Alcohol (U.S. average)	130	Accidents to bicycles	5
Accidents in home	95	All catastrophes combined	3.5
Suicide	95	Diet drinks	2
Diabetes	95	Reactor accidents (UCS)	2*
Being murdered (homicide)	90	Reactor accidents (NRC)	0.02*
Legal drug misuse	90	PAP test	-4
Average job (accidents)	74	Smoke alarm in home	-10
Drowning	41	Air bags in car	-50
		Mobile coronary care units	-125

# Risk comparison

Figure B.4  
The Causes of Cancer:  
Quantitative Estimates of the  
Avoidable Risk of Cancer in the U.S.

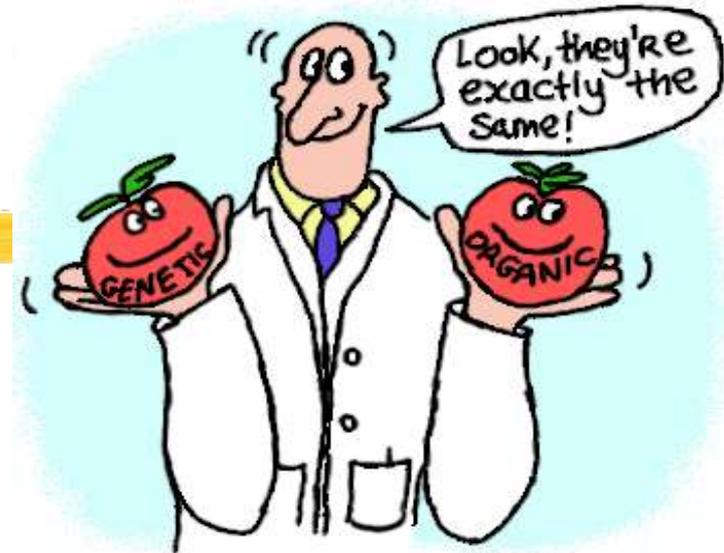




# What's wrong with risk comparison?



- The tables are often misleading, because they are neither clear nor consistent about the population used to calculate the risk.
- A careful risk comparison requires a good deal of background information
- Remember that a useful risk comparison must be accurate *and appropriate*.



# RISK, PEOPLE AND VALUES

# Risk and values

The people who desire to be informed, *want, in order of priority,*

- *how one is exposed to the risk,*
- *its consequences,*
- *whether it is controllable,*
- *other people's experience with the risk,*
- *who is responsible for the negative consequences,*
- *whether there are any advantages*

*(French, Maule, in Bennet, 2010)*

# Four different kinds of people



- **Equalitarians**, who think that nature is in fragile balance and that democratic participation is more important than expertise
- **Individualists**, who think that nature is indifferent to our decisions and that we are completely free to make our own decisions.
- **Hierarchists**, who want to establish rules and procedures for regulating risks
- **Fatalists**, who don't think that is possible to control events and useless to focus on individual decisions.

# System 1 and System 2



**System 2** = conscious analytical way of thinking, .

**System 1** = much simpler way of reasoning,  
“intuition”.

# The problem with System 1



“Communications based on reasoned arguments about relevant statistics on safety, effective risk management practices, and so on are unlikely to influence people if their understanding is derived from this kind of system 1 thinking”

(French, Maule, in Bennet, 2010).

**RISK AND  
PROBABILITY**



# Risk and probability/1



The most common biases on probabilities are:

**Availability bias:** more memorable events are perceived as being more frequent than others

**Confirmation bias:** people tend to pinpoint events that confirm their idea.

**Overconfidence:** we tend to think that our predictions/estimates are more correct than they really are.

# Risk and probability/2



1. A pandemic is arriving. If nothing were done, all 600 people at risk will die. If we chose the plan A, 400 people will die. If we follow the Plan B there is one in three chance that nobody will die, but two in three chance that 600 will still die.
2. A pandemic is arriving. If nothing were done, none of the 600 people at risk would be saved. If Plan A is chosen, 200 people will be saved. If plan B is chose, there is a one in three chance of saving all 600 600, but a two in three chance of saving nobody.

# Risk and probability/3



Is it better to communicate by words or by numbers?

The European Union (EC Directive 92/27) chose particular words for classifying the risk of medicines (side effects): from “very common” to “very rare”. But some studies showed that people don't interpret these words correctly: e.g. While “very rare” refers to a risk of 0,01%, the mean estimate given by people is 4%.

# Risk and probability/4

## ⌘ 4. Being misled by number games

“One of the rethorical devices that sources occasionally employ is emphasizing a statement’s objecivity and accuracy by using excessive precision in numbers”.

“Another number game sources often play is the relative risk reduction, inted of absolute risk reduction or number needed to treat, which give a more realistic picture of the clinical trade-off involved”.

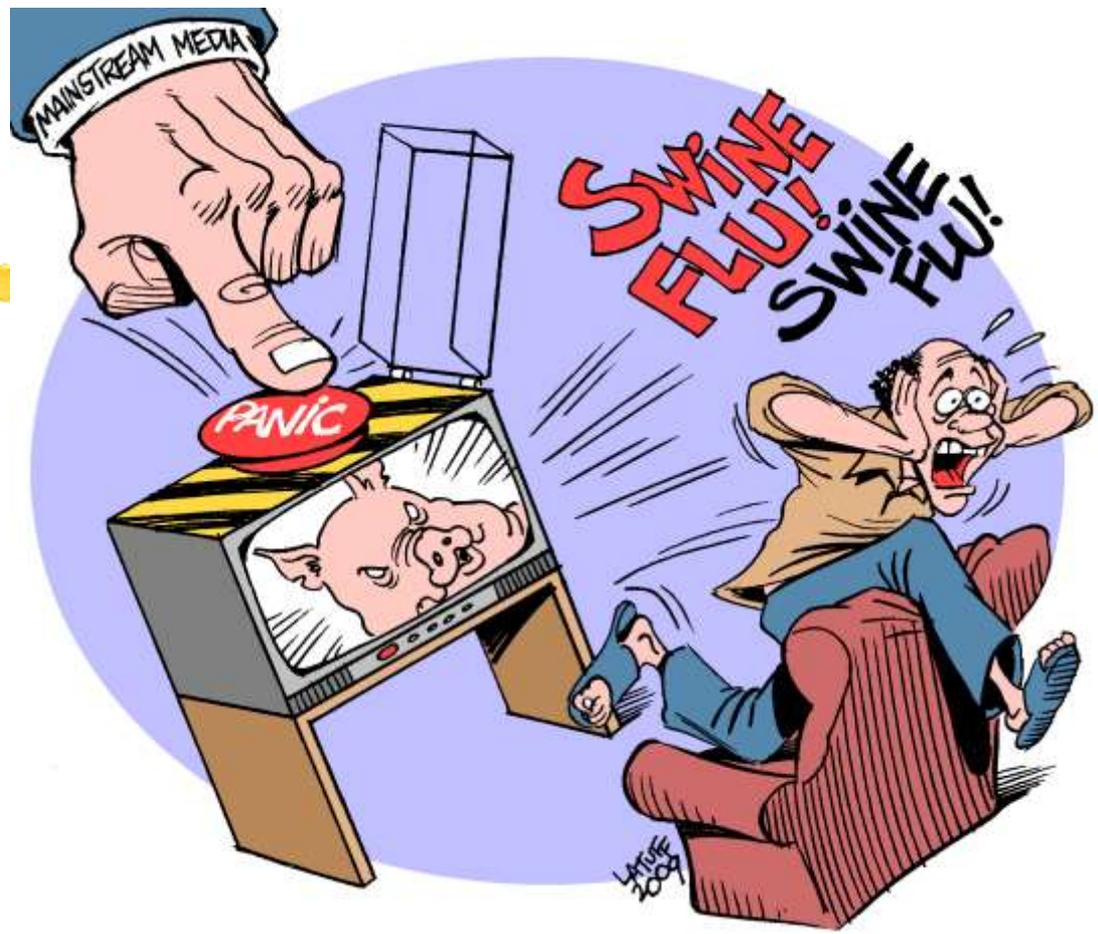
Sample of 207 TV and newspaper stories (1994-1998)

124 quantified benefits

83% use relative figures

3% use absolute figures

14% use both



# RISK AND MEDIA SYSTEM

# Risk and the Media/1



## ⌘ What matters in (traditional) media are stories... and faces, not evidence or data

We are overly susceptible to anecdotal evidence. Anecdotes make good reading and we are right to use them.. Ut we often forget to remind our readers - and ourseleves - of the folly of generalizing from a new a few interesting cases... The statistic is hard to remember. The stories are not”.

Philip Meyer, reporter

⌘ “I quickly learnt to drop the classic who, what, when, where and why. That’s not what reporters want. They want to tell good stories. So they need human faces, people, the picture, family portrait.”

Mark Stuart, PR director, Hill and Knowlton

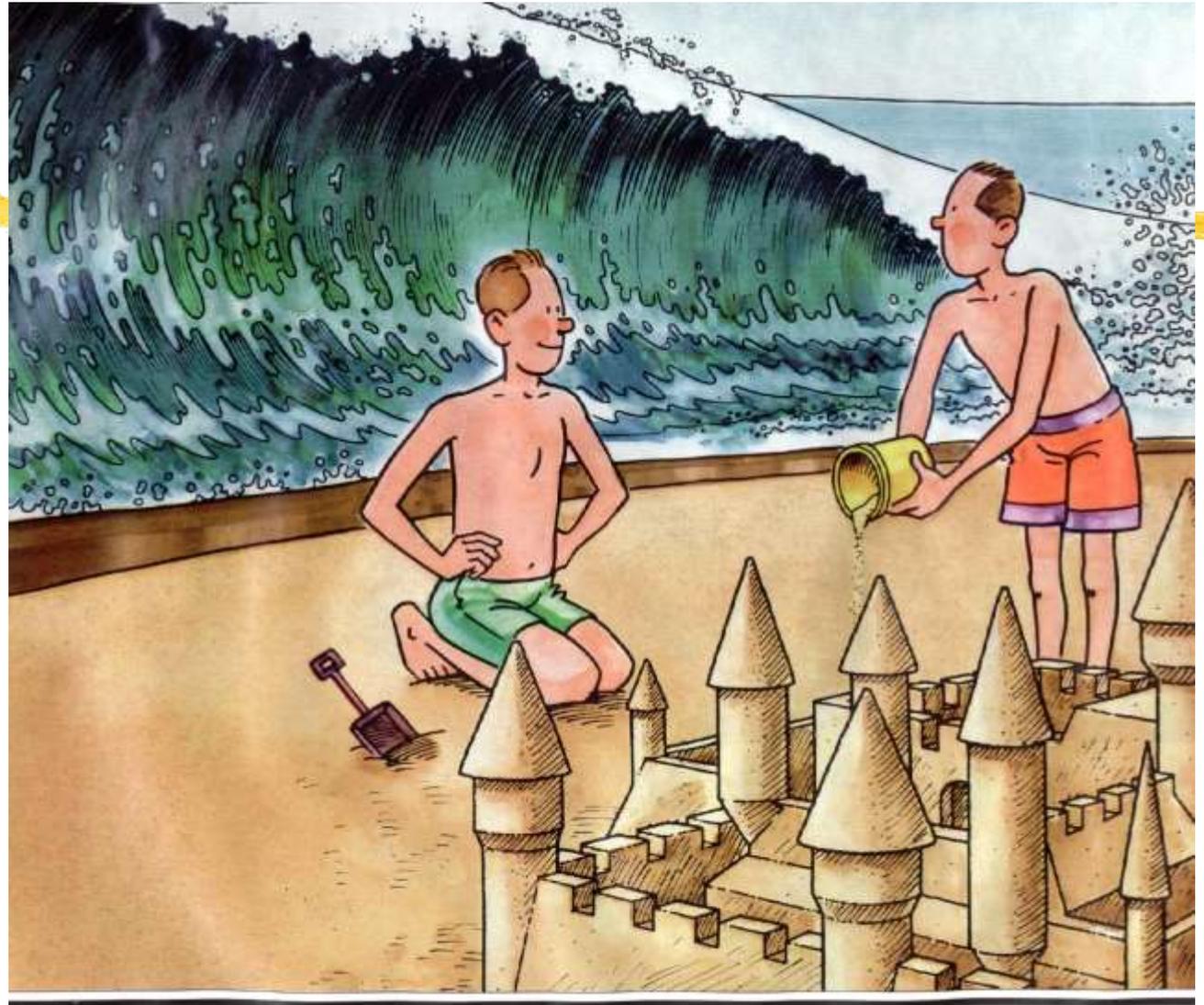
# Media and misjudging of risks



## Mistaking risk factors for diseases

“A risk factor is not an illness in itself but a signal. Many people who belong to an at-risk population will never develop the disease that they are at risk for”.

- Ex: high blood pressure  
treatment of people 35-54 age old with only mild hypertension  
> chances of avoiding stroke from 99,3% to 99,6%



Thank you!

**Anytime things appear to be going well, you have overlooked something.**