Vaccine acceptance or refusal?: *Individual choice vs societal needs* or *My risks vs “our” risks*

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What are risks to health?

Risk can mean different things to different people. The two most common meanings will be used in this report – risk as a probability of an adverse outcome, or a factor that raises this probability.

The World Health Report 2002

Reducing Risks, Promoting Healthy Life
Risk as feelings
(fast, instinctive, emotional...)

Risk as $\sqrt[5]{\frac{21}{2}}\frac{11}{10}\frac{3}{10}$
(logic, reason, scientific...)

Risk as Politics

Adapted from Slovic et al. Risk Analysis 2004; 24 (2): 311-22
So what do we need to do? 

- Scientists (and the Media!) must not treat fear and reservation as ignorance and then try to destroy them with a blunt "rational" instrument. (Pattison – BMJ 2001;323:838-840)

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**THE VACCINE REACTION**

“When it happens to you or your child, the risks are 100%”

Published by the National Vaccine Information Center
Reasons for vaccine hesitancy and opposition

In the 19th Century
• Principles were not well understood
• Vaccination is ineffective.
• Vaccination is not safe.
• Religious and philosophical concerns.
• Resistance to compulsory vaccination.

In the 21st Century
• Principles STILL not well understood
• Perception that vaccination is not needed
• Concerns about vaccine safety
• Religious and philosophical concerns
• Resistance to compulsory vaccination

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“Vaccine hesitancy” means scientists need to be more honest about risks

BMJ 2011; 342 doi: 10.1136/bmj.d2479 (Published 15 April 2011)
Cite this as: BMJ 2011;342:d2479

- Immunology (including allergy)
- Vaccination programs
- Child health
- Infectious diseases
- Neurogastroenterology

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NRA'S ROLE IN THE REGULATION OF DRUG SAFETY

National regulatory authorities (NRAs) are responsible for ensuring that every pharmaceutical product – including vaccines – used within the country is:

- Of good quality,
- Effective,
- Safe for the purpose or purposes for which it is proposed.

But what about the **perception** of safety??
Promoters of questions and risk perceptions

- **Adverse Event (AEFI)** – local AEFI are usually stronger prompters of rumors, but a distant event reported can also spread and provoke questions.
- **New research** reported.
- **New recommendation or policy change**
- **New product** (introduction of new product or product packaging)
Perceptions are also about motives
The role of social media

OPPORTUNITY or RISK?

Figure 12: The World of Social Media
Leading social media networks by country

A warning from history: how the polio virus escaped the GPEI

Report of the Independent Monitoring Board of the Global Polio Eradication Initiative
November 2012

Result of 2003-2004 rumour-driven vaccine boycott

The 2002 - 2005 northern Nigeria epicentre: over 1200 polio cases invaded countries far and wide (either directly or indirectly).
EHFG 2011: EXPERTS ADDRESS “VACCINE CONFIDENCE GAP”

The Internet and social media are proving a serious nuisance by spreading unfounded scare-stories about vaccines, the European Health Forum Gastein was told by vaccine expert Dr Heidi Larson. The consequences could be alarming. One was the return of measles, with the WHO posting 25,000 new cases in September 2011. Public trust in vaccines is highly variable, experts said, this needed to be addressed by decision makers.

France hit by Gardasil cancer vaccine scare

ONE of France's top medical experts has appealed for calm as a scare over Australian-pioneered cervical cancer vaccine Gardasil gathers momentum.

Japan withdraws support of controversial HPV vaccine over safety concerns

TOKYO, October 16, 2013 (LifeSiteNews.com) – While jurisdictions throughout the Western world continue to promote the HPV vaccine, the Japanese government has pulled its support of the controversial drug and sent formal notifications to local health officials saying that it should not be administered until safety concerns are investigated.

The vaccines in question, Gardasil and Cervarix, are meant to combat Human Papilloma Virus (HPV),
The HPV Vaccination in Japan

Issues and Options

MAY 2014

On-line media articles about Japan’s withdrawal of the recommendation of the HPV vaccine, identified in other countries

On-line media articles about the HPV vaccine identified by Japan

Comments following an article in the US about Japan

(All articles collected between April, 2013 to June 2014)
Herd immunity or Herd mentality?

**IN BRIEF**

**Herd mentality**

STOCKBROKERS behave like sheep, say Victor Eguiluz and Martin Zimmermann of the Mediterranean Institute for Advanced Study in Mallorca.

Market watchers have long known that stock market returns are not random, but follow a "power law" distribution. The researchers showed that in a model in which stockbrokers behave like flocking animals—sharing information and following the same rumours—the market returns vary in line with the power law (Physical Review Letters, vol 85, p 5659).

Melting mo
do!4m, warning of a
disease in Europe that
is making its way to
Catalonia, say scientists
and villagers in Europe.

Some like it hot

The common cold
brings things to a
halting, says a
researcher at the
University of
Cambridge. The
researcher has
found that a high
humidity can
increase the
spread of the
cold by up to
50%.

**London School of Hygiene & Tropical Medicine**

In an article for the journal Science, the researchers argue that high humidity can increase the spread of the cold by up to 50%.
Guangzhou pharmaceutical shares drop on vaccine doubts

Global Times | 2013-12-16 23:38:02
By Global Times

The share price of Guangzhou Baiyunshan Pharmaceutical Holdings dropped by more than 9 percent on both Shanghai and Hong Kong exchanges Monday, after its latest clinical report made experts doubt the effectiveness of the Hepatitis B vaccine that the company has been working on.

According to the report, published Friday, the occurrences of adverse events in experiment and placebo groups were both over 12 percent, meaning that no serious adverse event occurred.
Determinants of vaccine hesitancy

Understanding vaccine hesitancy around vaccines and vaccination from a global perspective: A systematic review of published literature, 2007-2012.
Understanding vaccine hesitancy around vaccines and vaccination from a global perspective: A systematic review of published literature, 2007-2012.

Can we monitor public confidence in vaccines?
Rumor Surveillance and Avian Influenza H5N1

Gina Samaan,‡ Mahomed Patel,† Babatunde Olowokure,† Maria C. Roces,† Hitoshi Oshitani,† and the World Health Organization Outbreak Response Team†

Assessing Vaccination Sentiments with Online Social Media: Implications for Infectious Disease Dynamics and Control

Marcel Salathé‡, Shashank Khandelwal
Influences on risk perceptions are highly varied

- Romanian
- Polish
- Russian
- English

Influences include:
- Religious and Ethical Beliefs
- Side Effects
- Development Disabilities
- Chemicals, Toxins and Unnecessary
- Conspiracy Theory
Modes of communication differ by location

Tracking Anti-vaccination Sentiment in Eastern European Social Media Networks. UNICEF.2013

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Perceptions of risk can have serious impacts

- In the Philippines, risk perceptions that tetanus vaccines caused sterilization led to a 45% drop in coverage between 1994 and 1995.

- In 1998, Andrew Wakefield’s publication linking MMR vaccine to bowel disease and autism caused public confidence to plummet. MMR coverage rates in England dropped from nearly 93% in 1997 to 79.9% in 2003-04 due to risk perceptions.

- In Japan, adverse events following HPV vaccination, amplified by negative media and a highly vocal victim support group led the government to withdraw their HPV recommendation (despite no evidence of vaccine-link) and HPV vaccine uptake plummeted from over 70% to under 10% between 2013-2014.
Although perceptions may seem to not have an immediate impact, they can have longer term impacts.
NAIROBI. MAY 2013  (25 years post-MMR Wakefield scare—risk perceptions travel)

A case of junk science, conflict and hype

Despite accumulating evidence that vaccines are safe, vaccination uptake is falling, driving a resurgence in old scourges of society.
This year, the U.S. is experiencing a higher than usual number of measles cases... it's so different than what we were seeing in back in 1989 to 1991. Seventy-nine percent of the U.S. residents cases that were unvaccinated had philosophical objections to the vaccine. .. ...outbreak in Texas, 20-actually 21 cases, more since we've made the report in the MMWR... Seventeen of those cases in Texas were unvaccinated. As these outbreaks are showing, clusters of people with like-minded beliefs leading them to forego vaccines can be susceptible to outbreaks when measles outbreaks are imported from elsewhere.
The nature of vaccine concerns also vary globally, by vaccine and over time.

Measuring vaccine confidence: analysis of data obtained by a media surveillance system used to analyse public concerns about vaccines

Heidi J Larson, David M D Smith, Pauline Paterson, Melissa Cumming, Elisabeth Eckesberger, Clark C Freifeld, Isaac Ghani, Caitlin Jarrett, Louisa Paesche, John S Brownstein, Lawrence C Madoff

Summary

Background The intensity, spread, and effects of public opinion about vaccines are growing as new modes of communication speed up information sharing, contributing to vaccine hesitancy, refusals, and disease outbreaks. We aimed to develop a new application of existing surveillance systems to detect and characterise early signs of vaccine issues. We also aimed to develop a typology of concerns and a way to assess the priority of each concern.
Figure 4: Proportionate number of times specific vaccine types were covered positively and negatively in the media, worldwide and in five selected countries.

Vaccine types were reported positively (A) 9157 times worldwide, 45 times in France, 22 times in Finland, 171 times in China, 236 times in Nigeria, and 261 times in Pakistan. Vaccine types were reported negatively (B) 4900 times worldwide, 154 times in France, 29 times in Finland, 94 times in China, 193 times in Nigeria, and 311 times in Pakistan. Country border data are from the Global Administrative Areas database. HPV = human papillomavirus, JEE = Japanese encephalitis.
POSITIVE SENTIMENT REPORTS


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New research shows that trying to change negative perceptions can make things worse

AAP study finds pro vaccine messages backfire

Published on March 7, 2014 by Marjorie Clark

The American Academy of Pediatrics published study results on Monday that found messages about the measles, mumps and rubella vaccine do not produce the desired effect of encouraging parents to vaccinate their children.
Risk = Hazard + Outrage

“Telling people they are wrong doesn’t work, no matter who they are or what the situation is.”

Box 6.2 Important lessons for governments on developing better risk communications

- To establish credibility it is necessary to generate trust
- Trust can only be generated by openness
- Openness requires recognition of uncertainty, where it exists
- The public should be trusted to respond rationally to openness
- The importance of precautionary measures should not be played down on the grounds that the risk is unproven
- Scientific investigation of risk should be open and transparent
- The advice and reasoning of advisory committees should be made public
- The trust that the public has in scientists, experts and professionals, such as chief medical officers, is precious and should not be put at risk
- Any advice to the public from such experts and advisory committees should be, and should be seen to be, objective and independent of government and political influence.
TRUST and RESPECT can be the tipping point..

Risk Perceptions

Personal Beliefs
Society
Culture

Media
Scientific Evidence
Politics

Decision Making
Risk/benefit communication is only part of an ongoing dynamic process...

- Risk assessment
  - assessment of vaccine risks
  - assessment of disease risks
  - individual vs. society risks
  - assessment of risk perceptions
  - assessment of external risks to vaccine delivery and the immunization programme (coinciding events, political scanning, historical events that could influence trust)

- Risk mitigation
  - apply risk assessment learnings to inform vaccine delivery strategies
  - engage communities in new vaccine introduction, new policy development, new programme strategies, changes in vaccine schedules
  - clear communication and transparency on reasons for vaccination, evidence of vaccine risks as well as risks of not vaccinating

- Risk management
  - vigilance in listening for signals of emerging concerns about vaccines or vaccination programmes
  - prompt detection of and response to adverse events following immunization (AEFI)
  - prompt responsiveness to managing public concerns resulting from both coincidental and causal adverse events

Confidence Commentary: A blog from Dr Larson

Why we need “science understanding the public” more than just “public understanding of science”: The case of vaccines

There has been a lot of media coverage around a recent study published in the journal PEDIATRICS where researcher Brendan Nyhan and his colleagues at Dartmouth College (US) tested different types of vaccine messages with parents to see which were the most effective.

Take part in our survey
Click here to take part in our survey on public concerns about vaccines.

In the news

1. India: Polio vaccine must for travelers to seven affected countries (09/03/2014)
People traveling from India to seven polio-endemic countries or coming from these places are required to have polio vaccination and produce a certificate for it, according to a new directive of the (India) Union government effective from this month. The notification of the health and family welfare ministry states that Indians going to Afghanistan, Ethiopia, Kenya, Nigeria, Pakistan, Somalia and Syria would have to take the oral polio vaccine at least four weeks prior to their departure...

(external link)

2. Pakistan: Anti-polio drive in Karachi’s 24 UCs; motorcycles banned (09/03/2014)
The Sindh government has announced eight-hour ban on the use of motorcycles in 24 ‘sensitive’ union councils of the metropolis today (Sunday) for the anti-polio campaign...At least three health workers, including two women, were assassinated