Vaccine Risk Communication: An Overview

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Conflicts of Interest

No financial conflicts to declare

My Biases:

- Consultant to Canadian Peadiatric Society Imm/ID Cmt
- Consultant to WHO Immunization/ Vaccines and Biologicals
- SAGE Working Group on Vaccine Hesitancy
- Canadian Centre for Vaccinology: Health Policy and Translation Group

I believe vaccines are safe, effective, serious diseases can occur if not immunized
Premise

An informed individual is not necessarily a behaviorally responsive one...

Many factors influence immunization decisions; it’s complex

“the cultural, emotional, political, and social context within which decisions are made may introduce substantial irrationality”


Anti-vaccine Movement one factor only

To ↑ uptake vaccines, we need to
- understand these factors
- develop savvy strategies to convince an individual/parent to want and accept immunization.

WHO Euro 2010
Vaccine Hesitancy

Vaccine hesitancy
• refers to delay in acceptance or refusal of vaccines despite availability of vaccine services.
• Complex; context specific varying across time, place, and vaccines.
• includes factors: 3 Cs

Problem HIC, MIC, LIC problem

WHO SAGE Working Group on Vaccine Hesitancy, 2014

Vaccine Concerns & Reluctance to Immunize

- Pertussis – SIDS
- Hep B – demyelinating dis
- MMR- autism
- Thimerosal- ASD
- Alum- inclusion myositis
- HPV-lowers sexual debut; more sexually active
- Multiple vaccines as cause of – cancer, diabetes, multiple sclerosis
- Multiples vaccines overwhelm immune system
- Natural infection is better than immunization

## Anti Vaccine Tactics

<table>
<thead>
<tr>
<th>Skewing science</th>
<th>Deny or reject science that fails to support antivac</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shifting hypothesis</td>
<td>Ongoing proposal new theories for vaccine harm; ever moving target</td>
</tr>
<tr>
<td>Censorship</td>
<td>Suppress dissenting opinion; shut down critics</td>
</tr>
<tr>
<td>Attacking the opposition</td>
<td>Attack critics via personal insults and by filing legal claims</td>
</tr>
</tbody>
</table>

*Kata A. Anti-vaccine activists, Web2.0 and the post modern paradigm.... Vaccine 2012;30:3778-89*
Kata A. Anti-vaccine activists, Web2.0 and the post modern paradigm....Vaccine 2012;30: 3778-89
Public Perspective of Risk: **Personal** not Sci/Evidence Based

“What does it mean for me and my family- what should I do about it?”

Even when believe vaccines imp for protection-may still be issues

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Benin et al Qualitative analysis of mothers' decision-making about vaccines for infants: the importance of trust Pediatrics 2006;117:1532-41
Risk Perception Problem: Impact of Heuristics

“Hard wired” to deal with life threatening situations with reflexive reactions

Heuristics: cognitive shortcuts - simplify complex decisions & judgments ... “automatic intuition”

MacDonald NE et al. Risk perception, risk management and safety assessment: What can governments do to increase public confidence in their vaccine system? Biologicals 2012;40(5):384-8
Cognitive Shortcuts - Heuristics -

Anchoring
Estimate by starting from a value know (anchor)
Judge probability future event by what occurred in past
Hear about serious AEFI - estimate AEFI as "more common" than reality

Omission bias
Actions more harmful than inactions
Reluctance to immunize

Availability
Judge an event as frequent or likely to occur if can easily imagine or recall it
Not recall serious vac preventable dis eg. measles
Have seen autism

Stories are powerful; anti vaccine movement knows this
Access to Vaccine Information

**Vaccine Confidence Project:** study media ++ vax > 10,000 in 144 countries in 1 year


2010 >80 % households in US, Can, UK internet access: > 80% seek health info...

esp like **user-generated content (Web 2.0),** such as **online news groups and blogs** (PEW Research Group 2010, Kata A. Vaccine 2012 )

**Web2.0** “everyone and anyone is an expert”

*now big audience for “fringe” views*

**Google™** provides **personalized** search results based on user’s **previous browsing habits**

Critics concerned-infringe users' privacy

**Immunization problem** – if find anti vaccine sites in searches and use them – will appear on first pages next searches...
Influence Vaccine Critical Websites: Vaccine Risk Perception

Websites
Accessing *vaccine critical* websites for 5 to 10 minutes
- ↑ perception of risk of vaccination
- ↓ perception of risk of omitting vaccination and changes intention to vaccinate.  
  *Betsch C et al J Health Psychology 2010 15:446-455*

Blogs
Accessing *vaccine critical* blog on HPV: “stories”
- ↑ perception of risk of vaccination
- ↓ changes intention to vaccinate
HPV vaccine supportive blog +ve; less effect: “facts”

**HPV on YouTube:**
2008 review majority +ve
2011 review 1/2 now -ve, 1/3 +ve, rest neutral
Social Networks Analysis: Vaccine Decisions

Social networks: -people: **HCW**, family, friends
-sources info –media, internet..

**Window or Mirror**

- opportunity to explore diverse viewpoints about immunization/
specific vaccines

**or**

- simply reflect and reinforce what that parent already believes

Opel DJ, Marcue E. Pediatrics 2013;131;e1619-20
Leask et al. Vaccine. 2006; 24(49–50):7238–7245
Medical Conspiracy Theories and Health Behaviors in the United States

Table 1. Americans Agreeing With Various Medical Conspiracy Theories, 2013

<table>
<thead>
<tr>
<th>Medical Conspiracy Narrative</th>
<th>Respondents, %&lt;sup&gt;b&lt;/sup&gt; (N = 1351)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Food and Drug Administration is deliberately preventing the public from getting natural cures for cancer and other diseases because of pressure from drug companies.</td>
<td>Heard Before</td>
</tr>
<tr>
<td>Health officials know that cell phones cause cancer but are doing nothing to stop it because large corporations won’t let them.</td>
<td>63</td>
</tr>
<tr>
<td>The CIA deliberately infected large numbers of African Americans with HIV under the guise of a hepatitis inoculation program.</td>
<td>57</td>
</tr>
<tr>
<td>The global dissemination of genetically modified foods by Monsanto Inc is part of a secret program, called Agenda 21, launched by the Rockefeller and Ford foundations to shrink the world’s population.</td>
<td>32</td>
</tr>
<tr>
<td>Doctors and the government still want to vaccinate children even though they know these vaccines cause autism and other psychological disorders.</td>
<td>19</td>
</tr>
<tr>
<td>Public water fluoridation is really just a secret way for chemical companies to dump the dangerous byproducts of phosphate mines into the environment.</td>
<td>69</td>
</tr>
</tbody>
</table>

Abbreviations: CIA, Central Intelligence Agency; HIV, human immunodeficiency virus.

<sup>a</sup> Percentages may not total 100% because of rounding.

49% of Americans agree ≥ 1 conspiracy theory; 18% agree ≥ 3

Fact conflicts with belief = rejected

Fact consistent with belief = accepted

Fact "reshaped" = accepted, changing belief

Do NOT Disturb

Public
HCP
Imm Program
Policy Makers

Strategies to Address Hesitant and Vaccine Refusers

Vaccine hesitant ≠ vaccine refuser

Focus on hesitant – most probability change
Much current background best practice comes from marketing, political and social science studies
Need more research for evidence based strategies
Little research on vaccine hesitancy done in LMIC

Trust = Competence + Caring

<table>
<thead>
<tr>
<th>CARING</th>
<th>COMPETENCE</th>
</tr>
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<tbody>
<tr>
<td>High</td>
<td>Trust</td>
</tr>
<tr>
<td>Low</td>
<td>Distrust</td>
</tr>
<tr>
<td></td>
<td>Respect</td>
</tr>
</tbody>
</table>

Benin et al Pediatrics 2006;117:1532-41
MacDonald NE, Finlay JC. Paediatr Child Health 2013;18(5):265-7
Role MDs & Nurses: Credible

“For all vaccines, the attitude of the physician ......is very influential in the decision to vaccinate a child.....”


Parents received vaccine information from MDs: < vac concerns vs from friends/family/books

Wheeler M, Buttenheim A. Human Vaccines & Immunotherapeutics2013; 9:1782–1789

Beware: Health Care Professional’s Imm Status program uptake......

If HCP not up to date:

patients less likely up to date

Zhang J., While AE, Norman IJ. Vaccine 2010, 28:7207-14

HCP immunization education is key
Diagnose if there is a Vaccine Hesitancy Problem

**Individual**

Do not assume!

First understand *if* any vaccine concerns......

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**Population/subpopulation**

Analysis of your uptake data—may unmask a problem

Need to determine if confidence complacency convenience

WHO EURO: The Guide to Tailoring Immunization Program- TIP


MacDonald NE, Finlay JC. Paediatr Child Health 2013;18(5):265-7
Parent Opinions on Importance Vaccines; Provider Estimate Parental Opinion

<table>
<thead>
<tr>
<th>Vaccine Importance</th>
<th>Parent N=401</th>
<th>Provider N=105</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child Health</td>
<td>9.5 (0-10)</td>
<td>9.3 (4-10)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Meningitis</td>
<td>9.4 (0-10)</td>
<td>9.2 (2-10)</td>
<td>0.002</td>
</tr>
<tr>
<td>Hepatitis</td>
<td>9.5 (0-10)</td>
<td>8.7 (3-10)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Rotavirus</td>
<td>9.0 (0-10)</td>
<td>8.4 (2-10)</td>
<td>0.535</td>
</tr>
<tr>
<td>Pertussis</td>
<td>9.5 (0-10)</td>
<td>9.3 (0-10)</td>
<td>0.006</td>
</tr>
<tr>
<td>Influenza</td>
<td>9.3 (0-10)</td>
<td>7.0 (1-10)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>HPV</td>
<td>9.2 (0-10)</td>
<td>5.2 (0-10)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Individual-Decision making partnership (HCP & Parent/Patient)

• Motivational interviewing:
  engage and motivate to change if hesitant about vaccines

• First understand *if* any vaccine concerns......
  vary with parent/youth/adult
  *validate why might believe this......
  .....esp if misinformation and/or misunderstanding

• Listen, listen, listen
  Be patient but consistent in message:
  **Vaccines safe, effective,**
  **serious diseases can occur if not immunized**

Tell- Don’t Ask: US Study

Who initiated the vaccine recommendation or plan specifically? (n = 111)

- No plan verbalized (3%; n = 3)
- Parent (13%; n = 15)
- Provider (84%; n = 93)

How does the PROVIDER initiate the vaccine recommendation? (n = 93)

- Presumptive (74%; n = 69)
- Participatory (26%; n = 24)

How does PARENT respond to the provider’s initiation?

- Accepts (74%; n = 51)
- Resists (26%; n = 18)

Accepts (4%; n = 1)

Provides own plan (13%; n = 3)

Resists (83%; n = 20)

Emphasize: Safety Monitoring for Vaccines

1. Pre-licensure review and approval
2. Good manufacturing procedures
3. Lot assessment before release
4. Post marketing surveillance AEFI – reporting
5. Causality assessment review: serious AEFI
6. Process for action if vaccine performance issue
7. Vaccine recommendations based upon epidemiology, vaccine effectiveness and efficacy (NITAG)
8. International collaboration (WHO/GACVS)

Vaccine Safety Throughout the Product Life Cycle. Pediatrics 2011;127 Supplement 1
MacDonald N, Pickering L. Canadian Paediatric Society, Infectious Diseases and Immunization Committee. Paediatr Child Health 2009;14(9):605-8,
Parrella A et al. Vaccine 2013;31:2067-74
Exploit Cognitive Shortcuts—

Tell compelling stories
HCPs own  Or

- www.immunize.org/reports/ *
- www.cdc.gov/CDCTV/PersonalFluStories/index.html
- www.cdc.gov/polio/stories/india4.html
- Vaccine Preventable Diseases: The Forgotten Stories- Texas

Children’s Hospital  anchor and recall
Shelby A, Ernst K. Story and Science .How providers and parents can utilize storytelling combat anti-vaccine movement. Hum Vac and Immuno 2013; 9:1795-1801

HCP can provide resources if appropriate

WHO EURO: If You Choose Not to Vaccinate Your Child, Understand the Risks and Responsibilities.

www.euro.who.int/en/what-we-do/health-topics/disease-prevention/vaccines-and-immunization/immunization-resources-centre

Parent concern-HCW unsure evidence - answer later
Address Pain Mitigation

Vaccine Pain

Concerns

patient, parent, HCP

44% parents*

measures to mitigate

*Kennedy et al. Pediatrics 2011;127 suppl S92-99

perception of benefit

anchor and recall

Vaccine MicroNeedle patches

Ipp and Taddio. Paediatr Child Health 2011;16:541-543
Norman JJ, Arya JM, McClain MA, Frew PM, Meltzer MI, Prausnitz MR. Vaccine 2014; 32: 1856–1862

http://www.youtube.com/watch?v=KgBwVSYqfps
http://pediatric-pain.ca/it-doesnt-have-to-hurt
Use Clear Language

1. Standard vocabulary
2. Consistent denominator
3. Present risks/benefits fairly
4. Explain single event probability (rain, not rain) visual aides
5. Absolute numbers not relative risk or %
6. Frame your message

Tetanus Disease
10% die even with ICU care = 100 in 1000

Frame the Message: HCP, Immunization Programs

What is framing?

- Presenting information of the equivalent outcome in terms of gains (positive) or losses (negative)

Ground Beef 25% fat

Ground Beef 75% lean


Frame Vaccine Message

Anxious about negatives:

vaccine 99% safe

better /more effective

than 1 % side effects

Often focus discussions: side effects not emphasize safety!

Beware: Vaccine Message Impact

Pro-vaccine messages **not** always work as intended. Effectiveness may vary with parental vaccine attitudes e.g., study messages designed to reduce vaccine misperceptions, increase MMR uptake. *Nyhan B et al Pediatrics* 2014;133:e835-42

<table>
<thead>
<tr>
<th>TABLE 3</th>
<th>Effects of Interventions on MMR Intention</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>All</strong></td>
<td>Least Favorable</td>
</tr>
<tr>
<td></td>
<td>0.52* (0.32–0.84)</td>
</tr>
<tr>
<td>Disease risks</td>
<td>0.98 (0.54–1.77)</td>
</tr>
<tr>
<td>Disease narrative</td>
<td>1.09 (0.62–1.94)</td>
</tr>
<tr>
<td>Disease images</td>
<td>1.29 (0.73–2.26)</td>
</tr>
<tr>
<td>Somewhat favorable toward vaccines (baseline: least favorable)</td>
<td>0.36* (0.20–0.64)</td>
</tr>
<tr>
<td>Most favorable toward vaccines (baseline: least favorable)</td>
<td>0.96 (0.50–1.86)</td>
</tr>
<tr>
<td>N</td>
<td>1751</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vaccine Attitudes</th>
<th>Somewhat Favorable</th>
<th>Most Favorable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Least Favorable</td>
<td>0.96 (0.50–1.86)</td>
<td>2.98 (0.48–18.36)</td>
</tr>
<tr>
<td>Somewhat Favorable</td>
<td>0.87 (0.45–1.68)</td>
<td>1.23 (0.29–5.30)</td>
</tr>
<tr>
<td>Most Favorable</td>
<td>2.26 (0.60–8.45)</td>
<td>0.82 (0.12–5.45)</td>
</tr>
<tr>
<td>N</td>
<td>678</td>
<td>529</td>
</tr>
</tbody>
</table>

Key: test messages in advance of use; tailor to fit . . . .
Partisans see unfavorably slanted content as even more polarized than is- *Gunther AC et al Comm Res* 2012;39: 439-57

**Targeted may work:** Vax hesitant mothers of 2 week olds—video, info–increased uptake. *Williams et al Acad Pediatr* 2013: 475-80
Use Social Media

Exploit pro-vaccine messages –
Rick Mercer (Canadian comedian) + ve rant on flu vaccine

http://www.youtube.com/watch?v=whks4DUPvXM&feature=youtu.be&a

consider tweets, emails with same message

3 text messages ↑ flu vaccine uptake in minority pop
1. risk of disease, vaccine safety
2 & 3. dates, place clinics

Stockwell et al JAMA 2012; 307:1702-08

Little data on impact social media LMIC
Do not Dismiss Children from your Practice over Vaccine Refusal

Frustrating BUT - small minority
Worth time and effort
– child’s best interest
Consider referral to “expert in vaccines” – may refuse
Dismissal not prompt parent to immunize;
not in best interest of child
Complex legal, ethical and public health issues
  e.g. may cluster, no care, no opportunity change

- WHO EURO: pamphlet - *If You Choose Not to Vaccinate Your Child, Understand the Risks and Responsibilities.*

Butterheim A et al Human Vaccines & Immunotherapeutics 2013; 9:8, 1819–1824
WHO EURO: Vaccine Safety Events: Managing the Communications Response

• Step by step practical guide for response to real or perceived AEFI


Increasing public attention to event and increasing impact on public trust dictates need for response

What, when, where, why, how and who steps
Blogs

WHO EURO – working with major health bloggers Eastern Europe esp to educate about VPD, vaccines- aim vaccine positive information in blog

Internet

Australian Vaccination Network Inc.

Blogs

WHO EURO – working with major health bloggers Eastern Europe esp to educate about VPD, vaccines- aim vaccine positive information in blog

March 2014

Lost appeal to keep it's name-forced to change
Lost charity status for fund raising

Australian Vaccination-skeptics Network Inc.

Formerly known as “Australian Vaccination Network Inc.”
Collaborate with Community

Politicians: Fed/Prov/State /Municipal

Community leaders
Business leaders
Religious leaders

Work with organizations
Peds, PH, NGOs etc
Public “power”

UNICEF: BUILDING TRUST IN IMMUNIZATION Partnering with Religious Leaders and Groups
www.unicef.org/ceecis/building_trust_immunization.pdf

“Calgary bishop’s HPV vaccine ban putting thousands of girls at risk: MDs”
National Post June 26, 2012

Grabenstein JD. Vaccine 2013;31:2011-23

saves time, resources, adds voice, enhances HW message credibility
Shape Children’s Beliefs on Vaccine Necessity, Benefits, Safety

Start early:

- **Primary**: what vaccines are, why needed, benefits, safety
- **Secondary**: weave into history, science and health
- **Engage expert teachers and students - many resources**


Opel D, Marcuse E. Human Vaccines & Immunotherapeutics 9:12, 2672–2673

Addressing Risk & Vaccine Hesitancy

1. Be well educated about vaccines, up-to-date with own imm.
2. Understand importance of vaccine beliefs; Work on trust; 
   Dx if hesitancy problem
3. Do not underestimate parental value of vaccines
4. How introduce vaccines matters: “Tell don’t ask”
5. Words matter: be fair, be truthful, frame message
6. Tell stories VPD; “nonstory“ vaccine receipt
7. Address pain with immunization
8. Don’t dismiss from your practice
9. Use social media, personal messaging, tailor messages to fit
10. Consider court challenge websites for Non truth telling
11. Work with community and other partners
12. Educate children/youth about vaccines

**Vaccines are safe, effective, serious diseases can occur if not immunized**
Websites

WHO: www.who.int/immunization/en/

List websites meet WHO quality criteria


www.unicef.org/ceecis/resources_1462.html
Vaccine Communication Resources

Websites
www.cdc.gov/vaccinesafety
www.immunizationinfo.org (Nnii)
www.immunize.org (IAC)
www.dovaccinescausethat.com
www.fda.gov/cber/safety
www.vaccinateyourbaby.org
www.voicesforvaccines.org
www.caringforkids.cps.ca/handouts/immunization_information_on_the_internet
www.vaccineinformation.org/
www.bccdc.ca/NR/rdonlyres/DADA3304-7590-48AC-8D2C-65D54ADFC77E/0/CDC_IC_Tool.pdf
Selected References


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Kata A. Anti-vaccine activists, Web2.0 and the post modern paradigm....Vaccine 2012;30:3778-89

Larson H et al Measuring vaccine confidence: analysis of data obtained by a media surveillance system used to analyse public concerns about vaccines Lancet Infect Dis 2013;13(7):606-13.
Benin et al Pediatrics Qualitative analysis of mothers' decision-making about vaccines for infants: the importance of trust. 2006;117:1532-41

MacDonald NE, Finlay J. Working with vaccine hesitant parents. Paediatr Child Health 2013;18(5):265-7


Fox S, Purcell K. Social media and health. PEW Research Internet Project http://www.pewinternet.org/2010/03/24/social-media-and-health/


Betsch C et al The influence of vaccine-critical websites on perceiving vaccination risks J Health Psychology 2010 15:446-455


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Leask et al. What maintains parental support for vaccination when challenged by anti-vaccination messages? A qualitative study Vaccine. 2006; 24(49–50):7238–7245


Williams et al. A Randomized Trial to Increase Acceptance of Childhood Vaccines by Vaccine-Hesitant Parents: A Pilot Study Acad Pediatr 2013: 475-80


Paling J. BMJ 2003; Strategies to help patients understand risks 327:745-748

Alaszewski A, Horlick-Jones T. How can doctors communicate information about risk more effectively? BMJ 2003; 327:728-731


Ansari M et al. Reducing resistance against polio drops. JRSH 2007;127:276-9
Favin et al. Why children are not vaccinated: a review of the gray literature
International Health 2012; 4:229-238

Wheeler M, Buttenheim A. Parental vaccine concerns, information source, and choice of alternative immunization schedules Human Vaccines & Immunotherapeutics 2013; 9:1782–1789

Zhang J., While AE, Norman IJ. Knowledge and attitudes regarding influenza vaccination among nurses: A research review. Vaccine 2010, 28:7207-14

WHO EURO: The Guide to Tailoring Immunization Program- TIP

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www.pediatrics.org/cgi/doi/10.1542/peds.2013-2037

Institute of Medicine 2013 The Childhood Immunization Schedule and Safety: Stakeholder Concerns, Scientific Evidence, and Future Studies
http://www.nap.edu/catalog.php?record_id=13563

Vaccine Safety Throughout the Product Life Cycle. Pediatrics 2011;127 Supplement 1

MacDonald N, Pickering L. Canadian Paediatric Society, Infectious Diseases and Immunization Committee. Canada’s eight-step vaccine safety program: Vaccine literacy. Paediatr Child Health 2009;14(9):605-8

Parrella A et al. Parental perspectives of vaccine safety and experience of adverse events following immunisation. Vaccine 2013;31:2067-74

Shelby A, Ernst K. Story and Science .How providers and parents can utilize storytelling to combat anti-vaccine movement. Hum Vac and Immuno 2013; 9:1795-1801

Kennedy et al. Vaccine Attitudes, Concerns, and Information Sources Reported by Parents of Young Children: Results From the 2009 Health Styles Survey Pediatrics 2011;127 suppl S92-99


Brighton Collab. Immunization site pain: Case definition and guidelines for collection, analysis, and presentation of immunization safety data Vaccine 2012;30:4558-77


WHO EURO: Vaccine Safety Events: Managing the Communications Response


Grabenstein JD. What the World’s religions teach, applied to vaccines and immune globulins. Vaccine 2013;31:2011-23


Opel D, Marcuse E. Rethinking vaccine policy making in an era of vaccine hesitancy. Time to rebuild, not remodel? Human Vaccines & Immunotherapeutics 9:12, 2672–2673
Objectives/Outcomes

Following this presentation, the learner will be able to

• define vaccine hesitancy

• outline factors that influence parental acceptance of vaccine

• describe strategies to address vaccine hesitancy

• access resources useful in working with parents, HCP on vaccine hesitancy