Vaccine Hesitancy
How can health care workers improve vaccine acceptance?

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Conflicts of Interest
No financial conflicts to declare

My Biases:
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- Advisor to WHO Immunization/ Vaccines and Biologicals
- Consultant WHO EURO, SERO- Vaccinology
- 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
WHO SAGE Working Group
Definition of Vaccine Hesitancy (2014)

**Vaccine Hesitancy**
- refers to delay in acceptance or refusal of vaccines *despite availability of vaccine services*
- *is complex and context specific* varying across *time, place and vaccines*
- is influenced by factors such as *complacency, convenience and confidence.*

Problem in HIC, MIC, LIC

Vaccine Hesitancy
Determinant Categories

Perceived risks VPD low; vaccination not deemed a necessary preventive action. Other life /health responsibilities higher priority at time

Physical access-availability, affordability, willingness to pay; geographical access, ability to understand (language, health literacy); appeal of immunization services

Trust in vaccines, in delivery system, in the policy-makers who decide which vaccines are needed and when.

SAGE Working Group on Vaccine Hesitancy Final Report
www.who.int/immunization/sage/meetings/2014/october/SAGE_working_group_revised_report_vaccine_hesitancy.pdf?ua=1

Antivaxers May influence
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

Probability Change Mind about Immunization

hesitant individual moderate to high

vaccine refuser low

vaccine denier very low or zero

**Anti-Vaccine Tactics:**

Kata A, Vaccine 2012; 30: 3778-89
Diethelm P, McKee MEuro J Public Health 2009;19:2-4

<table>
<thead>
<tr>
<th>Skewing science &amp; Misrepresentation</th>
<th>Deny or reject science that fails to support antivac; False logic; jump to conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selectivity</td>
<td>Referring to isolated papers that challenge scientific consensus.</td>
</tr>
<tr>
<td>Impossible expectations</td>
<td>Expecting 100% certain results or health treatments with no possible side-effects</td>
</tr>
<tr>
<td>Shifting hypothesis</td>
<td>Ongoing proposal new theories for vaccine harm; ever moving target</td>
</tr>
</tbody>
</table>
## Anti-Vaccine Tactics:

<table>
<thead>
<tr>
<th>Tactics</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conspiracies</td>
<td>Arguing that scientific consensus is the result of engaging in a complex and secretive conspiracy</td>
</tr>
<tr>
<td>Fake Experts</td>
<td>Using fake experts as authorities combined with denigration of established experts.</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>
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</table>

Kata A, Vaccine 2012; 30: 3778-89
Diethelm P, McKee MEuro J Public Health 2009;19:2-4
Assimilation Bias

Public
HCP
Imm Program
Policy Makers

Risk Perception – it’s Personal 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 in reality

Availability
Judge an event as frequent or likely to occur if can easily *imagine or recall* it

Omission bias
*Actions* more harmful than inactions
Reluctance to immunize

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 Larson H et al Lancet Infect Dis 2013;13(7):606-13.

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, 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
- 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
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></td>
<td>63</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>57</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>32</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>19</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>69</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>25</td>
</tr>
</tbody>
</table>

49% of Americans agree ≥ 1 conspiracy theory; 18% agree ≥ 3 > Conspiracy beliefs > avoid traditional health care e.g. flu vac

Systematic Review of Strategies to Address Vaccine Hesitancy

Systematic review of strategies peer-reviewed and gray literature (2007-2013) & Review of Reviews

Identified:

- no strategies to specifically overcome hesitancy in all populations
- strategies that improved vaccine uptake
- multicomponent more effective than single


Dube E, Gagnon D, MacDonald NE; SAGE Working Group on Vaccine Hesitancy. Strategies intended to address vaccine hesitancy: Review of published reviews Vaccine. 2015;33:4191-203
10 Approaches to Enhance Vaccine Acceptance/Address Hesitancy

At Immunization Program Level

1. Diagnose if there is a problem- TIP
2. Employ strategies known to increase vaccine uptake.
3. Communication plan to fit, exploit heuristics, support resiliency
4. Work on “Gateway” beliefs
5. Help shape beliefs early

At individual Level

6. HCP – key role; don’t underestimate parental value of vaccines
7. Don’t dismiss from your practice
8. Tell don’t ask strategy; exploit heuristics
9. Mitigate pain at immunization
10. Clarity language; -frame message; emphasize safety, community immunity
Approaches to Enhance Vaccine Acceptance/Address Hesitancy

Immunization Program
Vaccine Hesitancy: WHO EUR: The Guide to Tailoring Immunization Program- “TIP”

At Immunization Program Level:

Don’t assume you know cause of low uptake…….

TIP framework to help

1) *identify* and *prioritize* vaccine hesitant populations and subgroups,
2) *diagnose* the demand and supply –side barriers and enablers to vaccination in these vax hesitant populations
3) *design evidence –informed responses* to vaccine hesitancy appropriate to the setting, context and hesitant population
4) **Evaluate** impact and outcomes


Butler R, MacDonald N. Diagnosing the determinants of vaccine hesitancy in specific subgroups: Guide to Tailoring Immunization Programmes (TIP). Vaccine 2015;33():4176-9
Immunization Program Interventions

Most Effective on ↑ Vaccine Uptake

KEY: Segment population, individuals:

a) directly target
   • unvaccinated or under-vaccinated populations
   • specific populations: e.g. local community, HCW;

b) aim to increase knowledge, awareness about vaccination;

c) improve convenience and access to vaccination;

d) employ reminder and follow-up;

e) engage religious or other influential leaders to promote vaccination in the community.

f) mandate vaccinations / sanctions for non-vaccination*;

Mandatory Vaccination

Some HIC- require immunization for school entry
e.g. USA, Australia (not New Zealand)
Canada – only three provinces

Outcome: US-
increased rates non medical exemptions;
not lead to high uptake rates overall i.e. may backfire
- UK –
150 years ago compulsory small pox vaccine
- huge antivax rallies –non medical exemptions
  i.e. prepare for backlash

Maybe wiser to address hesitancy by other means

Need Communication Plan: Program /Individual Level

1. Be proactive
2. Two way process - equal parts listening and telling
3. Knowledge is NOT enough to change behaviour – stories help knowledge to stick
4. Many communication tools ...... what and how use needs to be planned

Tell compelling stories
HCPs own Or
- www.immunize.org/reports/
- www.ovg.ox.ac.uk/meningococcal-disease

Protecting Our Tomorrows: Portraits of Meningococcal Disease: Anne Geddes

Anchor and recall

Goldstein S, MacDonald NE, Guirguis S and the SAGE WG on Vaccine Hesitancy. Health communication and vaccine hesitancy. Vaccine 2015;33: 4212-4
Kata A. Anti-vaccine activists, Web2.0 and the post modern paradigm....Vaccine 2012;30: 3778-89

Internet

March 2014
Lost appeal to keep it’s name- forced to change
Lost charity status for fund raising

How to respond to vaccine deniers
A guide for spokespersons of health authorities facing a public debate.......WHO EURO- out soon
Impact of Vaccine Messages: Varies

Effectiveness varies with parental vaccine attitudes

Nyhan B et al Pediatrics 2014;133; e835-42

Pro-vaccine messages:
work for those who are favorable: important for ↑ resiliency
but in unfavorable - not reduce vaccine misperceptions, nor
increase uptake-i.e. “backfire effect” reinforce negative views

Partisans see unfavorably slanted content as even more
polarized than it is Gunther AC et al Comm Res 2012;39: 439-57

Key: test messages in advance; tailor to fit

Targeted may work: Vax hesitant mothers of 2 week olds – video, info–
increased uptake Williams et al Acad Pediatr 2013: 475-80
Focus on Dangers VPD more Effective than Refuting Vaccine Myths

Horne et al PNAS 2015

3 VPD messages
a) mother’s perspective on her child contacting measles
b) Picture child with measles
c) 3 short warning about how imp to immunize against measles

VS CDC summary
studies MMR not cause autism

VS control – other non vax scientific information
Communication Plan

- Be proactive;
- Communication is a two-way process;
- Knowledge is important but not enough to change behaviour;
- Choose knowledge to focus on carefully;
- Know your target audience;
- Many communication tools available
  - be selective, target appropriate,
  - use creatively to promote vaccine uptake;

Evaluate impact and adjust as need to

*Goldstein S, MacDonald NE, Guirguis S and the SAGE WG on Vaccine Hesitancy. Health communication and vaccine hesitancy. Vaccine 2015;33: 4212-4*
For the modern-day immunization program manager, the mantra needs to be: communicate, communicate, and then communicate some more.....but be sure fit target audience

Goldstein S, MacDonald NE, Guirguis S and the SAGE Working Group on Vaccine. Health communication and vaccine hesitancy. Vaccine 2015
“Gateway” to Beliefs

Knowledge is NOT enough

Research on climate change beliefs

Belief in a scientific fact increases when consensus is highlighted

Van der Linden, S et al. How to communicate the scientific consensus on climate change: plain facts, pie charts or metaphors?. *Climatic Change* 2014 126; 255-262.

Underlining the scientific consensus on vaccine safety and efficacy maybe gateway to change or shape belief
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

Evidence can shape beliefs and behaviour of children

- Bullying
- Exercise initiatives
- Environmental activism


Approaches to Enhance Vaccine Acceptance/Address Hesitancy

Individual
MDs & Nurses: *Key- role in Acceptance*

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

Favin et al. International Health 2012; 4:229-238

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

Wheeler M, Buttenheim A. Human Vaccines & Immunotherapeutics 2013; 9:1782–1789

HCP information or assurances - main reason why parents who planned to delay or refuse a vaccine for their child changed their minds


Beware: Health Care Professional’s Imm Status program uptake. If HCP not up to date: patients less likely up to date

*HCP immunization education key*
**Vaccine Refusers and Hesitant**

**Refusers:**
- Do Not dismiss
- Build trust – caring and competence
- Not debate
- Maybe able to determine concerns with “what would it take to move you to a yes to accept vaccines?”
- **Responsibilities for refusers WHO EURO**
- Consider referral to “expert”

**Hesitant:**
- Determine basis of hesitancy – do not assume
- Do not over estimate parental concerns
- **Listen and listen**
- **Tailor response to concerns**


# Do not Underestimate How Much Parents Value Vaccines

<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>

Tailor your Discussion e.g. If Safety Concerns Focus on Robust Safety System 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 (EMA, Country 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
Tell- Don’t Ask: Vaccine Hesitancy 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)a

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

How does PARENT respond to the provider’s initiation?b

Accepts (74%; n = 51)  
Accepts (4%; n = 1)  
Provides own plan (13%; n = 3)  
Resists (26%; n = 18)c  
Resists (83%; n = 20)c

Pain and Distress with Immunization

• 35%-45% of parents are concerned with pain during childhood vaccinations
• 70% of parents would be less anxious if vaccines were given in a non-painful way
• 85% of parents say doctors/nurses should make vaccinations less painful
• 95% of parents want to learn about reducing pain in their children

Kennedy et al. Pediatrics 2011;127 suppl S92-99,
Time Locked EEG Changes with Immunization

Verriotis et al. Pain 2015;156: 222-230
Prevalence of Needle Injection Fears - HIC

24% of parents are afraid

63% of children are afraid

N=1907

Address Pain Mitigation

2015 Canadian Pain Guidelines (Taddio et al): HELPinKids&Adults

CMAJ: August 24, 2015

- Covers age range: neonates to adults
- Updated & new evidence, twice as many interventions assessed
- **Rotavirus vaccine**—many have high sucrose content – study show benefit give just before injection vaccines
- **Breast feeding during the injection**

WHO : Report to SAGE on Reducing pain and distress at the time of vaccination.
http://www.who.int/immunization/sage/meetings/2015/april/1_SAGE_latest_pain_guidelines_March_24_Final.pdf

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

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

1000 Children

Tetanus 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:

Pneumococcal conjugate vaccine

> 99.9% safe

better / more effective

than say << 0.1 % serious side effects

Often HCP focus discussions on side effects not emphasize safety!

Community Protection: Herd Immunity

Romina Libster: The power of herd immunity
TEDxRiodelaPlata · 14:41 · Filmed Nov 2014
Subtitles available in 4 languages

https://www.ted.com/talks/romina_libster_the_power_of_herd_immunity
WHO SAGE: How to Deal with Vaccine Hesitancy

Three categories
(1) need to *increase the understanding of vaccine hesitancy, its determinants* and the rapidly changing challenges it entails;
(2)*Increase structures and organizational capacity to decrease hesitancy* and *increase acceptance of vaccines* at the global, national and local levels;
(3)*share lessons learnt and effective practices* from various countries and settings as well as the development, validation and implementation of new tools to address hesitancy.

Hilary Clinton’s Tweet mid Feb 2015 vs Anti vaxers:
The science is clear:
The earth is round, the sky is blue, and #vaccineswork.
Let's protect all our kids (and adults).
#GrandmothersKnowBest

https://bookstore.cps.ca/