Vaccine Hesitancy: Definition and Dimensions

Noni MacDonald MD, FRCPC
Dalhousie University,
Canadian Centre for Vaccinology
Halifax, Canada
IAIM Joint Regional Meeting
Feb 2, 2017
Conflicts of Interest

No relationship with commercial interests
i.e. no conflicts of interest

• Noni MacDonald:
  professor, Dalhousie University, Halifax Canada,
  consultant and adviser to WHO EURO and WHO HQ

• Biases

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

Hesitancy: as old as vaccination itself

Since Jenner first scraped cow-pox blisters & inoculated people, see examples resistance to vaccination

Vaccine refusal:
associated with outbreaks many diseases in many different countries, including:
• Pertussis in the UK, US and Japan
• Measles in USA, Canada, France etc
• Polio in Nigeria
• Tetanus in Philippines and Kenya

Definition of Vaccine Hesitancy

**Vaccine Hesitancy**

- refers to delay in acceptance or refusal of vaccines *despite availability of vaccine services*

- **complex and context specific** varying across *time, place and vaccines*

Problem in HIC, MIC, LIC

---

**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

MacDonald NE and SAGE Working Group on Vaccine Safety. Vaccine 2015; 33(34):4161-4
Hesitancy – a Global Problem: 2014 JRF

Most common reasons cited*
1) risk/benefit of vaccines (epidemiological and scientific evidence)
2) knowledge/awareness issues around vaccines
3) Religion/culture/gender/socio-economic issues

* Only 29% based on surveys.

- Marti et al article revision submitted
**Vaccine Hesitancy Determinant Categories**

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

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

**Confidence**

**Convenience**

**Complacency**

*Antivaxers May influence*

*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
Risk perceptions are intuitive, automatic and often unconscious.

Emotions play a role in how people make decisions.

Emotions play a role in how people interpret numerical information.

Kahan D. Sci 2103; 342: 53-4
Vaccine Hesitancy

influenced by many social, cultural, demographic and socio-psychological factors

- We are strongly influenced by what we think others around us are doing or expecting us to do
- We see causation in coincidences
- We see what we believe, rather than believing what we see
- We prefer anecdote and stories to data and evidence
- We are becoming increasingly hypervigilant to risk for our children

Dube E, MacDonald NE. Lancet ID 2016; 16(5):518-9
Addressing Dimensions of 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

Complex not simple problem


12 Approaches to Enhance Vaccine Acceptance/Address Hesitancy

At Immunization Program Level
1. Detect and address hesitancy
2. Ensure HCW best immunization practices
3. Utilize evidence based strategies known to ↑ uptake
4. Effective Communication plan
5. Educating children, youth, adults on the importance immunization for health
6. Work collaboratively

At individual Level
7. HCP – key role in imm
8. Don’t dismiss from practice
9. Use effective parental discussion techniques
10. Use clear language
11. Reinforce role community immunity
12. Address pain at immunization

Dube E, MacDonald NE. Lancet ID 2016;
1. Everyone is *not* Same: Detect and Address Vaccine Hesitant Subgroups

Reasons for hesitancy vary;
- not uniform over population;
- may change over time;
- vary by vaccine;
- may be clustered.

At program level: **key to identify subgroups low immunization**- hard if no immunization registry

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

*Butler R, MacDonald N.* Vaccine 2015;33:4176-9

Geographical distribution of measles cases in Belgium Jan – March 2011 n=151

outbreak started in anthroposophical schools in Ghent (Flanders) in February.

2. HCW Impact Vaccine Acceptance: Ensure HCW use Best Immunization Practices

HCW’s own immunization status: -reflects onto their patients’ status

HCW vaccine beliefs: - influences whether families will come forward and accept immunization

For optimal outcome patients need to hear from all HCW:
- consistent, accurate information: vaccine preventable disease risks, vaccine safety & benefits
- given in a respectful, positive manner

HCP immunization education key
Ensure HCW immunization up to date

Shibli et al Vaccine online Dec 30, 2016
3. Multiple dimensions to hesitancy: Use Effective Strategies to ↑ Vaccine Uptake

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

b) aim to increase knowledge, awareness about vaccination*;

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

d) improve convenience and access to vaccination;

e) employ reminder and follow-up;

f) mandate vaccinations / sanctions for non-vaccination, $$ incentives;

Jarrett C, et al. Vaccine 2015; 33:4180-90; Dube E et; Vaccine. 2015 14;33:4191-203; Das et al
Journal of Adolescent Health 2016; 59:S40eS48
Religion and Vaccines

Review of major religions of world –
-most religious doctrines support
- caring for others,
- preserving life
- having a duty to the community (family, neighbours, each other) *i.e support vaccination*

- exception Christian Scientists

Polio scare Israel 2014: multi pronged approach- including work with IMA, IPA, rabbis, imams etc

Grabenstein JD. Vaccine 2013;31:2011-23

WHO EURO Collaborative Project with Sweden: “Hard-To-Serve” pop
https://www.fhi.no/globalassets/migrering/dokumenter/pdf/tailoring-immunization-programmes-an-example-from-sweden-.pdf
Bystrom et al Vaccine 2014;32: 6752-7

Ease of Access Matters

HPV 3 dose Coverage among Girls in high income countries

- Australia 71.2%
- United Kingdom 60.4%
- United States 33.4%

Flu Vaccine: Pharmacies, Schools

- Australia 71.2%
- New Brunswick and Labrador 20.3%
- Prince Edward Island 42.3%
- Nova Scotia 30.4%
- New Brunswick 42.3%
- Quebec 30.4%
- Ontario 34.3%
- Manitoba 20.3%
- Saskatchewan 30.4%
- Alberta 42.3%
- British Columbia 34.3%

• UK 2014/15 Flu vax uptake in schools in UK > than pharmacy/GPs
• US: Flu vac uptake in schools > MD office - Rochester 54.1% vs 47.4%, P < .001

http://www.statcan.gc.ca/pub/82-624-x/2015001/article/14218-eng.htm
http://deainfo.nci.nih.gov/advisory/pcp/annualReports/HPV/Part4.htm#sthash.GEesnLWt.IWYKoqM2.dpbs
Reminders Make a Difference

**Systematic review:** effect on 0-5 years imm; adolescents
- postal and telephone reminders help

Work in HIC, MIC, LIC

*SMS infant vax reminder LMIC(Guatemala City ) Domek et al Vaccine 2016; 34: 2437-2443*
*Das JK et al Journal of Adolescent Health 2016; 59:S40eS48*

**Text Messages** in general practice for flu vax

**Seniors**

2 min video on pneumococcal vaccines email link sent to seniors prior to clinic visit -\(\uparrow\) uptake -
- 6 mo study: 116- 75% opened message, 64% viewed all if viewed 3 X \(\uparrow\) uptake

*Cameron KA et al 2016 J Gen Int Med 2016; 31 Suppl 2  S174*
Mandatory Vaccination and $ Incentives

Mandatory Immunization for school entry
Outcome: complex area

US- ↑rates non medical exemptions;
not always lead to high uptake -may **backfire**

UK- 150 years ago compulsory small pox vaccine: **backlash**

Canada Ont/ NB – not > imm uptake rates than other provinces
no mandatory

**Incentives:**

HCW: UK -GP imm incentives ↑ uptake; US RCT Peds-no ↑

Patient incentives: sys review – not enough evidence but where
done like: Australia

*Moss et al Pediatrics 2016;138(6): e20161414 ; Wigham et al Peds 2014; 134:e1117–e1128*
4. Effective Communication

- Knowledge ≠ Action
- Knowledge is important but not = change behaviour
- Be proactive NOT just reactive
- Communication is a two-way process: listening is key
- Choose knowledge to focus on carefully
- Target audience- tailor plan to fit
- Many communication tools available*

Evaluate impact and adjust as need to

*Odone et al Hum Vaccin Immunother 2015;11(1):72-82 (review effectiveness new media )

Goldstein S et al Vaccine 2015;33: 4212-4
Shelby A, Ernst K. Hum Vac and Immuno 2013; 9:1795-1801
Impact of Vaccine Messages: Varies

Pro-vaccine messages:
work for those +ve about vaccines: important for ↑ resiliency
if –ve about vaccines - not reduce vaccine misperceptions, nor increase uptake-i.e. “backfire effect” reinforce negative views.

<table>
<thead>
<tr>
<th>TABLE 3 Effects of Interventions on MMR Intention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Partisans see unfavorably slanted content as even more polarized than it is

Key: test messages in advance; tailor to fit

Amount and Type of Information Matters

CDC HPV vax information; compared impact of
a) stand info alone
b) a + VAERS summary
c) a +VAERS full detailed reports serious AEFI ( no CA)

_Schearer et al Vaccine 2016 ; 34: 2424-9_
Targeted Messages Can Work

Freemantle, Western Aust
- low rates imm, esp amongst alternative lifestyle group

“ I Immunize” campaign
- multi pronged
- explicitly appealed to/ derived from: local values around social justice, parenting and alternative lifestyles

- did polarize views:
- BUT amongst alternative lifestyle group: now 77% +ve

Inoculating Against Misinformation: Extrapolating from Climate Change

Research on climate change beliefs

Belief in a scientific fact increases as scientific consensus is highlighted

“Gateway Belief Model”

What if false information presented? e.g. false meme - goes viral

Can confer attitudinal resistance: preemptively highlight false claims, refute potential counterarguments.

Van der Linden, S et Global Challenges 2017, 1600008

What about vaccine misinformation?

No similar studies

WHO EURO: How to respond to vocal vaccine deniers in public

5. 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
• Denmark- CPN – developing curriculum
• Canada -Ontario has included child and youth vac edu in 2020 Imm plan

*Teachers Kit, National Immunization Poster Contest in Canada.*

*Opel D, Marcuse E. Human Vaccines & Immunotherapeutics* 2013;9:2672–2673

*Nowak G, Gellin B, MacDonald NE, Butler R et al*  *Vaccine* 2015; 33: 4204–4211
6. Work Collaboratively Partnership: Key Asset

National immunization program
Public health
Academia
HCPs
HCP societies
Manufacturers *
Civil Society Organizations
Global agencies
Private Sector
NGOs

Shared objectives:
(i) communicate proactively on immunization,
(ii) prepare for issues that may arise
(iii) Understand challenges better through existing and future research

saves time, resources, adds voice, enhances credibility health worker vaccine message

7. Key Role HCP in Vaccine 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
Witteman HO. Addressing vaccine hesitancy with values Pediatrics 2015;136 :215-7

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


Mother’s lack of uptake of flu vaccination in pregnancy predicts infant immunization

Fuchs EL. Self-reported prenatal influenza vaccination and early childhood vaccine series completion Prev Med 2016;88: 8-12
8. 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


9. Use Effective Parental Discussion Techniques

a) Presumptive: Tell don’t ask:

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

- 74% accept n=51
- 26% resisting n=18
- 4% accept n=1
- 13% provide own plan n=3
- 83% resisting n=20

Opel et al Pediatrics 2013; 132: 1037-46
9. Use Effective Parental Discussion Techniques

b) Address Concerns: Motivational Interviewing

- client centred, semi-directive, aimed at changing behaviour
- shift from TALKING TO → WORKING WITH

“What would it take to move you to a yes to accept vaccines?”

Tailor discussion to fit concerns

Leask et al. BMC Pediatrics 2012, 12:154
10. Use Effective Clear Language

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 *
7. Avoid using jargon **

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

MacDonald NE et al. Help with Vaccine Hesitant Parents; an Update. Paediatrics & Child Health in press
Data graphics HPV & vaccine: www.informationisbeautiful.net/2011/is-the-hpv-vaccine-safe-v-2-0/
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!

At pop^n pandemic H1N1: Sweden +ve frame: 60%

Australia-ve frame : 18%

NACI Canada. Canadian Immunization Guide
Focus on Gist Communication (Fuzzy Trace Theory)

Verbatim
Establishes credibility and expertise

Evidence based fact or Statistic

Explicit Link
Connects verbatim with GIST

Scripted phase

GIST
Helps comprehension and recall

Bottom line meaning

eg And the reason that’s important is...
What that means to you is...
So the thing to remember is...
Bottom line - what I tell patients is......

11. Present Concept: Community Protection/Immunity

Not use Jargon: Herd Immunity

- Reinforcing added value community immunity helpful US in 2015 – first measles death in 12 years in immunocompromised patient
- **BUT: not at expense note personal benefit**
  - not all VPD preventable with this e.g. tetanus
- Jargon: can be a problem
  - “herd Immunity”

[https://www.ted.com/talks/romina_libster_the_power_of_herd_immunity](https://www.ted.com/talks/romina_libster_the_power_of_herd_immunity)
Broniatowski DA, Hilyard KM, Dredze M. Vaccine. 2016;34(28):3225-8
12. Address Pain Mitigation

2015 Canadian Pain Guidelines (GRADE):
HELPinKids&Adults  

- Covers age range: neonates to adults
- Updated & new evidence, twice as many interventions assessed vs 2010
- **Rotavirus vaccine**-many have high sucrose content — study show benefit give just before injection vaccines
- Breast feeding during the injection
- Give most painful vax last **need help - manufacturers

WHO : Report to SAGE on Reducing pain and distress at the time of vaccination. (reviewed using AGREE)

[http://www.who.int/immunization/sage/meetings/2015/april/1_SAGE_latest_pain_guidelines_March_24_Final.pdf](http://www.who.int/immunization/sage/meetings/2015/april/1_SAGE_latest_pain_guidelines_March_24_Final.pdf)
Do Not to Neglect the Vaccine Accepting Group as Address Hesitancy

- Value their decisions
- Grow their resiliency against anti-vaccine messages & sentiments
- Potentially powerful allies for immunization if speak up
  - Imp for self and community
  - Set social norm for nudge