www.freewebs.com/edward_jenner/the_cow_pock_large_cartoon.jpg

Anti-Vaccine Movement: Strategies to address Vaccine Hesitancy

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Canadian Center for Vaccinology
Dalhousie University
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Capital Health

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

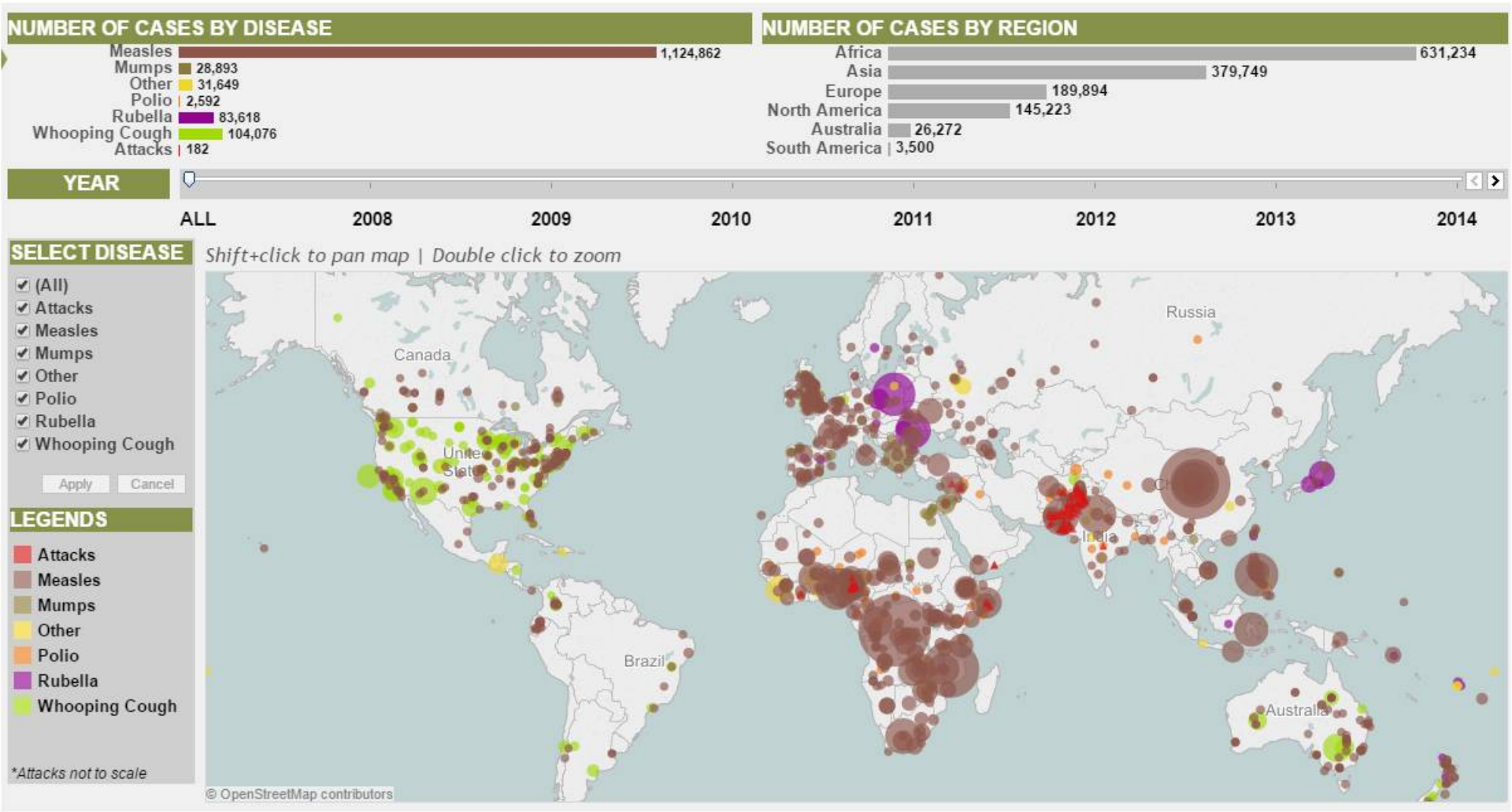
I believe vaccines are safe, effective, serious diseases can occur if not immunized

Objectives

By the end of this session, the participants will be able to outline why

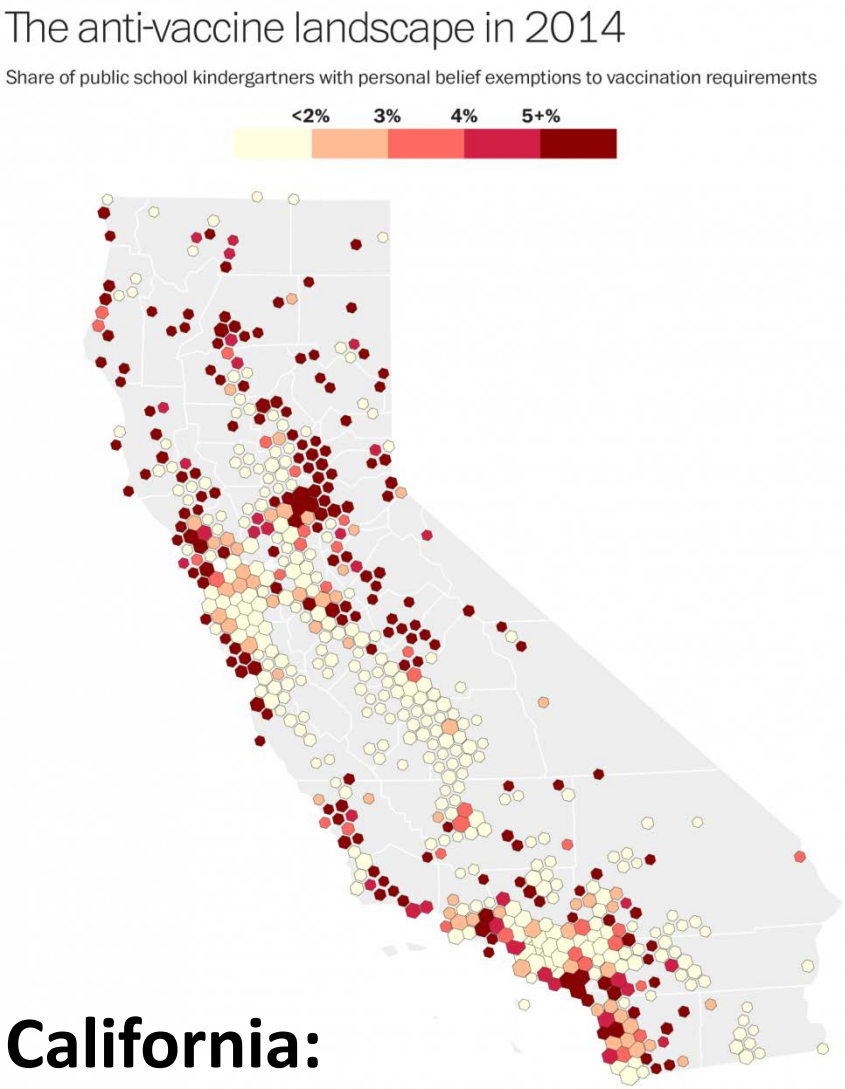
- **define vaccine hesitancy**
- **outline factors that influence parental acceptance of vaccines**
- **describe effective approaches to addressing hesitancy**

Vaccine Preventable Diseases



http://www.huffingtonpost.com/2014/10/27/anti-vaccine-disease-outbreaks_n_6056862.html

Disneyland Measles Outbreak



California:
% personal belief exemptions

USA

- By Jan 2015 > 95 cases in 14 states
- 2014 – record 644 cases measles despite eliminated measles in 2000

Canada

- >130 cases measles- Lanaudière region QC
  - started via Disneyland contact

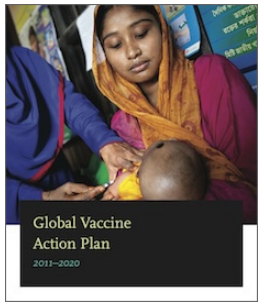
Maximum and Current Reported Morbidity Vaccine-Preventable Diseases, Canada

Disease	Pre-vaccine Peak Annual Cases	2007-11	% change
Diphtheria	9,010	4	- 100
Measles	61,370	752	-98.8
Mumps	43,671	1,110	-97.5
Pertussis	19,878	1,961	-90.2
Polio	5,384	0	-100
Rubella	37,917	10	-99.9
CRS	29	1	-96.6
Tetanus	25	6	-91.6
Invasive Hib	671	18	-97.4
TOTAL	477,955	3862	99.2%

Adapted from: http://www.phac-aspc.gc.ca/publicat/cig-gci/p01-02-eng.php#tab1

Immunization So Important….

Global Vaccine Action Plan 2011-2020: Passed by World Health Assembly 2012:



"Immunization is, and should be recognized as, a core component of the **human right to health** and an individual, community and governmental responsibility." *http://www.who.int/immunization/global_vaccine_action_plan/GVAP_doc_2011_2020/en/*

The vision: for the Decade of Vaccines (2011–2020) is of a world in which all individuals and communities enjoy lives free from vaccine-preventable diseases.

The immunization programme that saved millions of lives. *Bull World Health Organ 2014;92:314–315 (GAVI)*

Vaccine Concerns & Reluctance to Immunize

www.freewebs.com/edward_jenner/the_cow_pock_large_cartoon.jpg

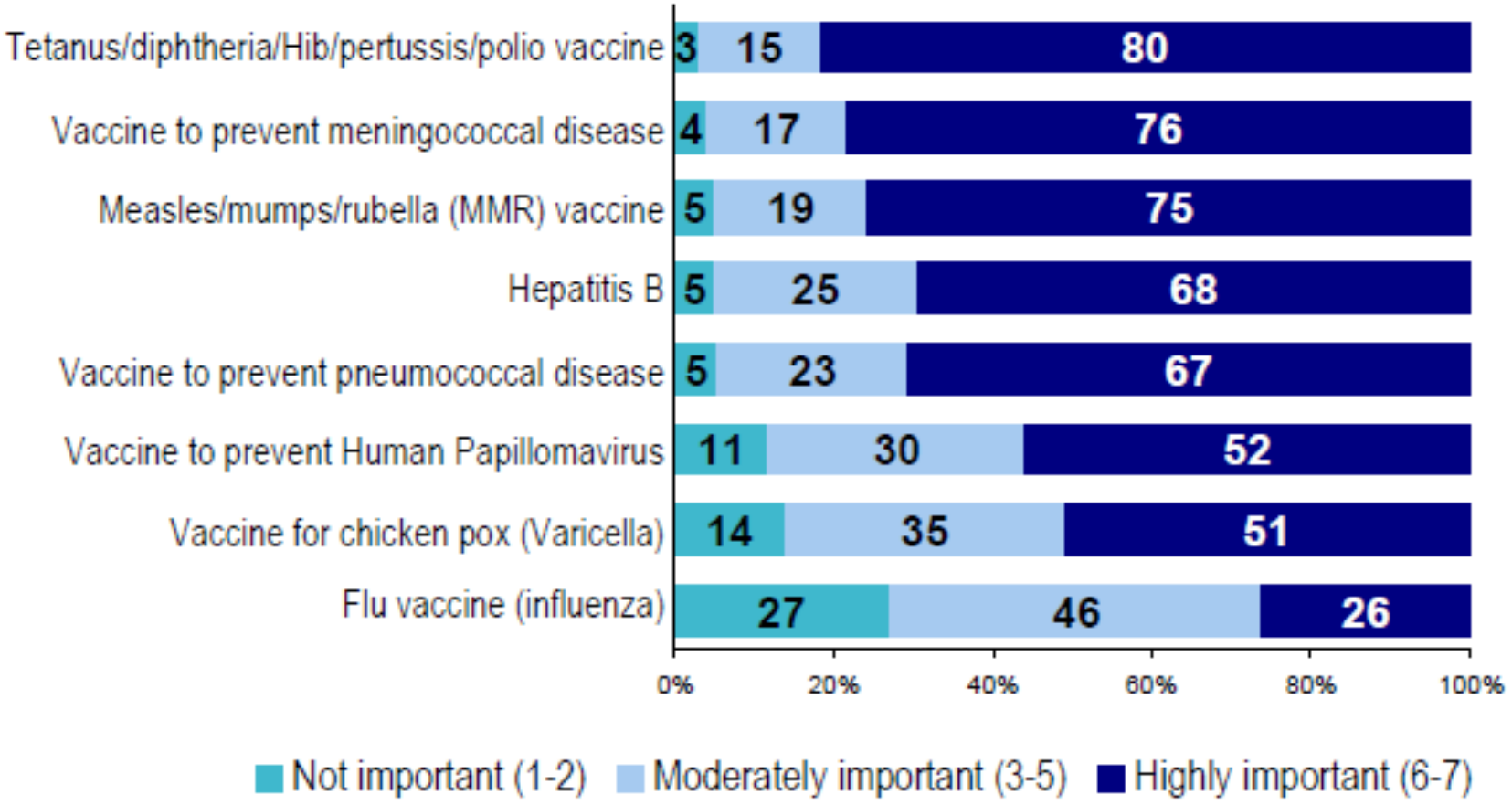
- Pertussis – SIDS
- Hep B – demyelinating dis
- MMR- autism
- Thimerosal- ASD
- Alum- inclusion myositis
- HPV-lower sexual debut; more sexually active
- Multiple vaccines as cause of – cancer, diabetes, multiple sclerosis
- Multiples vaccines overwhelm immune system
- Natural infection is better than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

Not New

Poland GA, Jacobson RM. The clinician's guide to the anti-vaccination galaxy. Hum Immun 2012;73:859-66.
Tafuri et al Addressing the anti-vaccine movement and role of HCWs. Vaccine 2014 - http://dx.doi.org/10.1016/j.vaccine.2013.11.006

Relative Importance of Different Vaccines

"How important do you think the following vaccines are in preventing disease in children?"



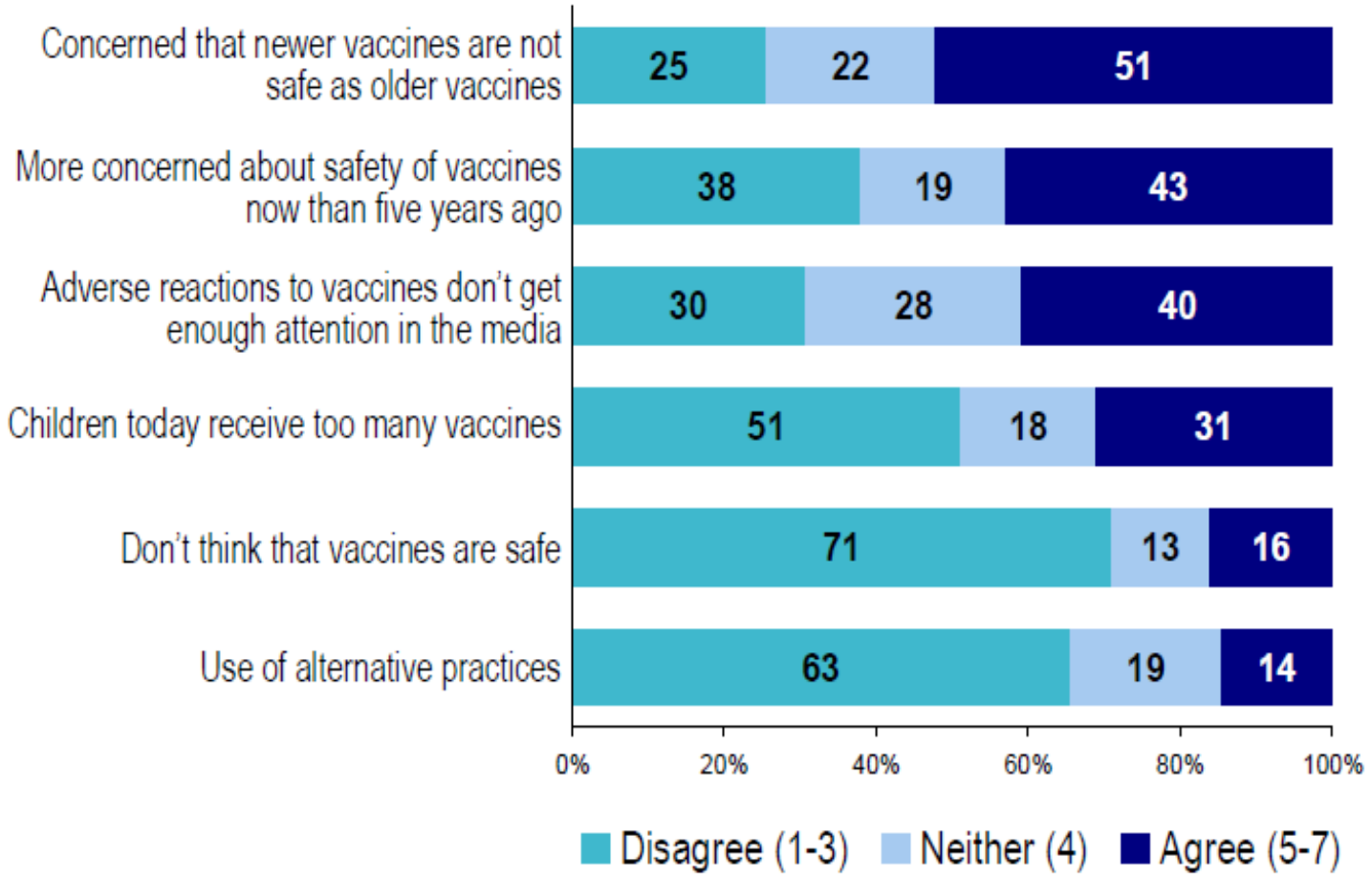
EKOS Research Associates Inc.

n=1745

Vaccine Safety Survey, 2011

Concerns about Vaccine Safety

"To what extent do you agree with the following statements?"



EKOS Research Associates Inc.

n=1247-1285

Vaccine Safety Survey, 2011

Angus Reid Poll February 2015

1500 Canadians thoughts on vaccinations

Good and not so good news

- 88%: vaccinations prevent diseases in individuals
- 86%: vaccines are effective for the community as a whole.*

  http://www.ted.com/talks/romina_libster_the_power_of_herd_immunity?utm_source=newsletter_daily&utm_campaign=daily&utm_medium=email&utm_content=button__2015-02-25
- 83%: would vaccinate their own children.
- 74% agreed people who oppose childhood vaccinations are "irresponsible.”
- 63% said vaccinations should be mandatory.

Angus Reid Poll February 2015

1500 Canadians thoughts on vaccinations

BAD News

- 39% said "the science on vaccinations isn't quite clear."
- Approx 30% believed "serious" side-effects may accompany vaccinations.

Anti Vaccine Tactics

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

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

National Vaccine Information Center

safeMinds

Sensible Action For Ending Mercury-Induced Neurological Disorders

loveforlife.com.au

Australian Vaccination Network Inc.

Because every issue has two sides

Consumer Warning: NSW Fair Trading has directed Australian Vaccination Network to change its name because it regards the name to be misleading. The Australian Vaccination Network is challenging this Direction and the challenge is currently before the NSW Administrative Decisions Tribunal

GENERATION RESCUE
autism is reversible

VaccineInfo.net

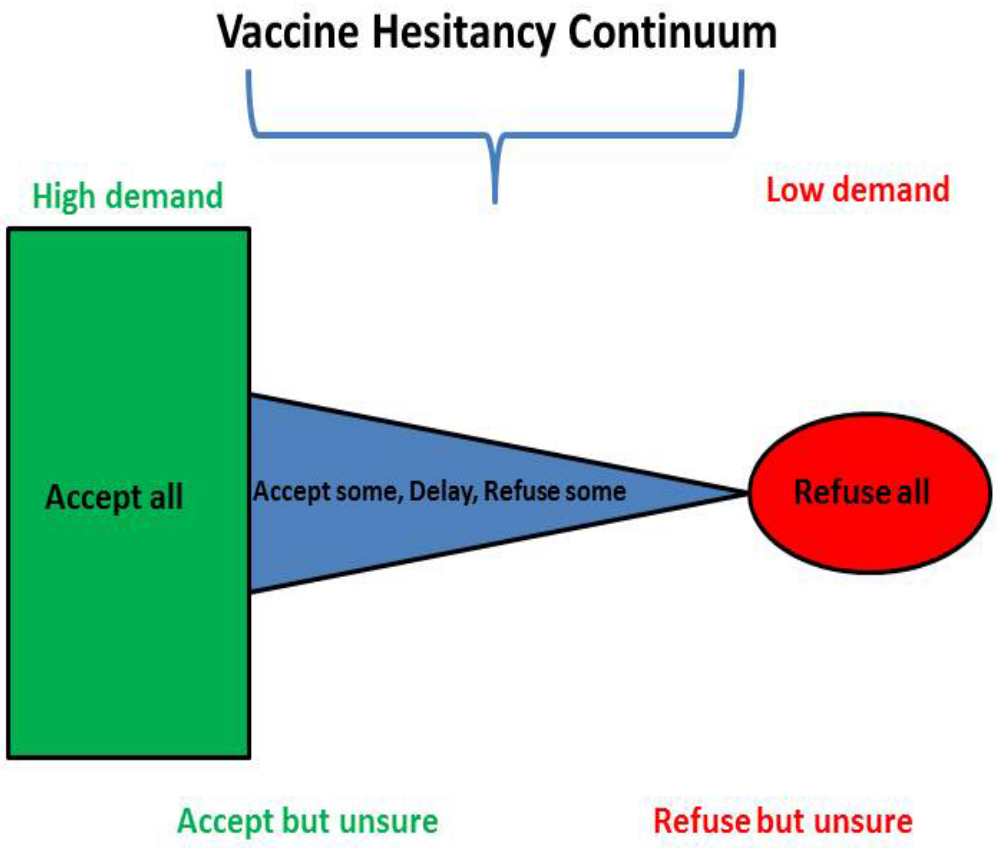
Kata A. Anti-vaccine activists, Web2.0 and the post modern paradigm….Vaccine 2012;30: 3778-89

WHO SAGE Working Group Vaccine Hesitancy (2014)

Vaccine Hesitancy

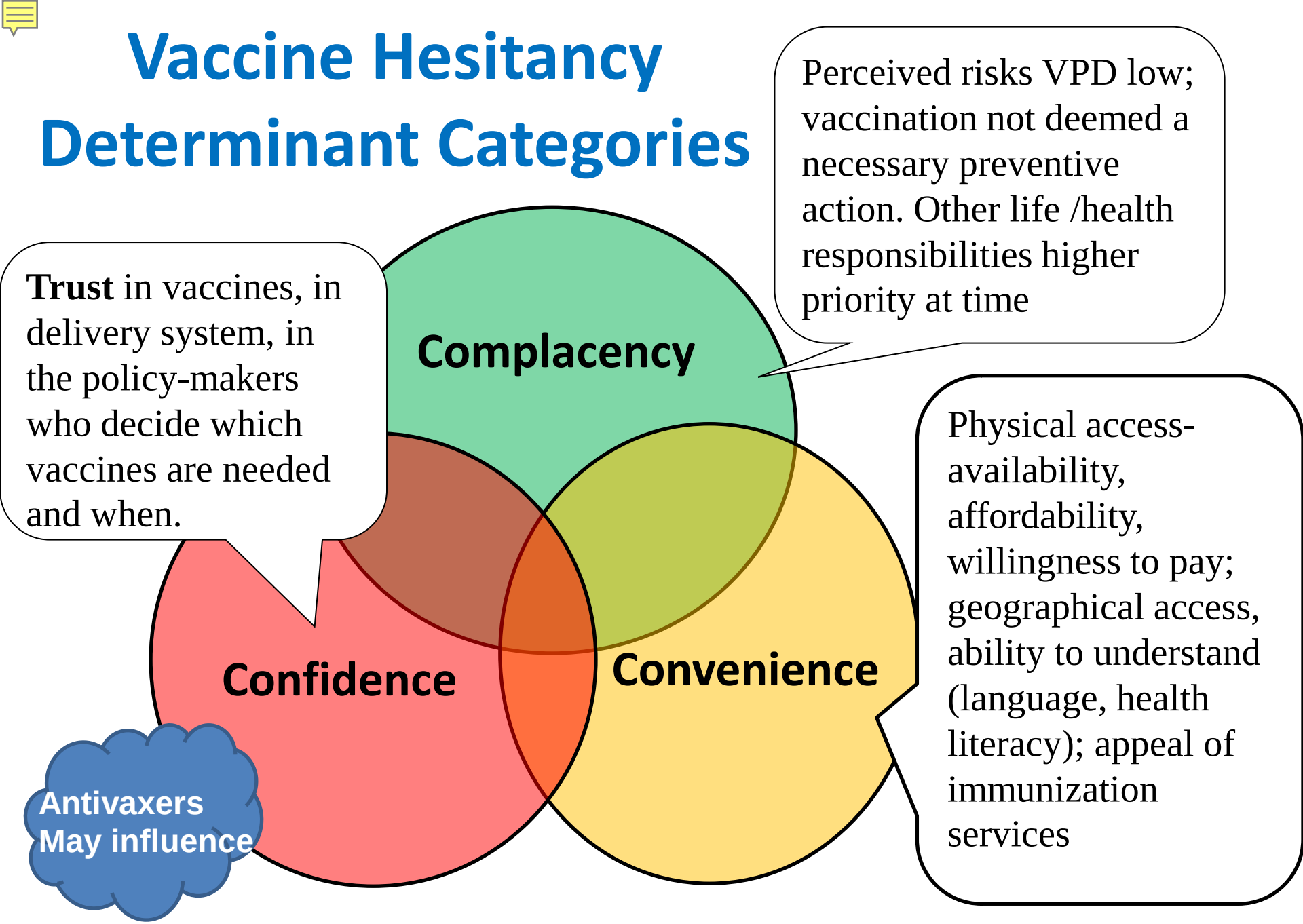
- refers to delay in acceptance or refusal of vaccines *despite availability of vaccine services*
- *is **complex** and **context specific** varying across **time, place** and **vaccines***
- is influenced by factors such as **complacency, convenience and confidence.**

Problem in HIC, MIC ,LIC

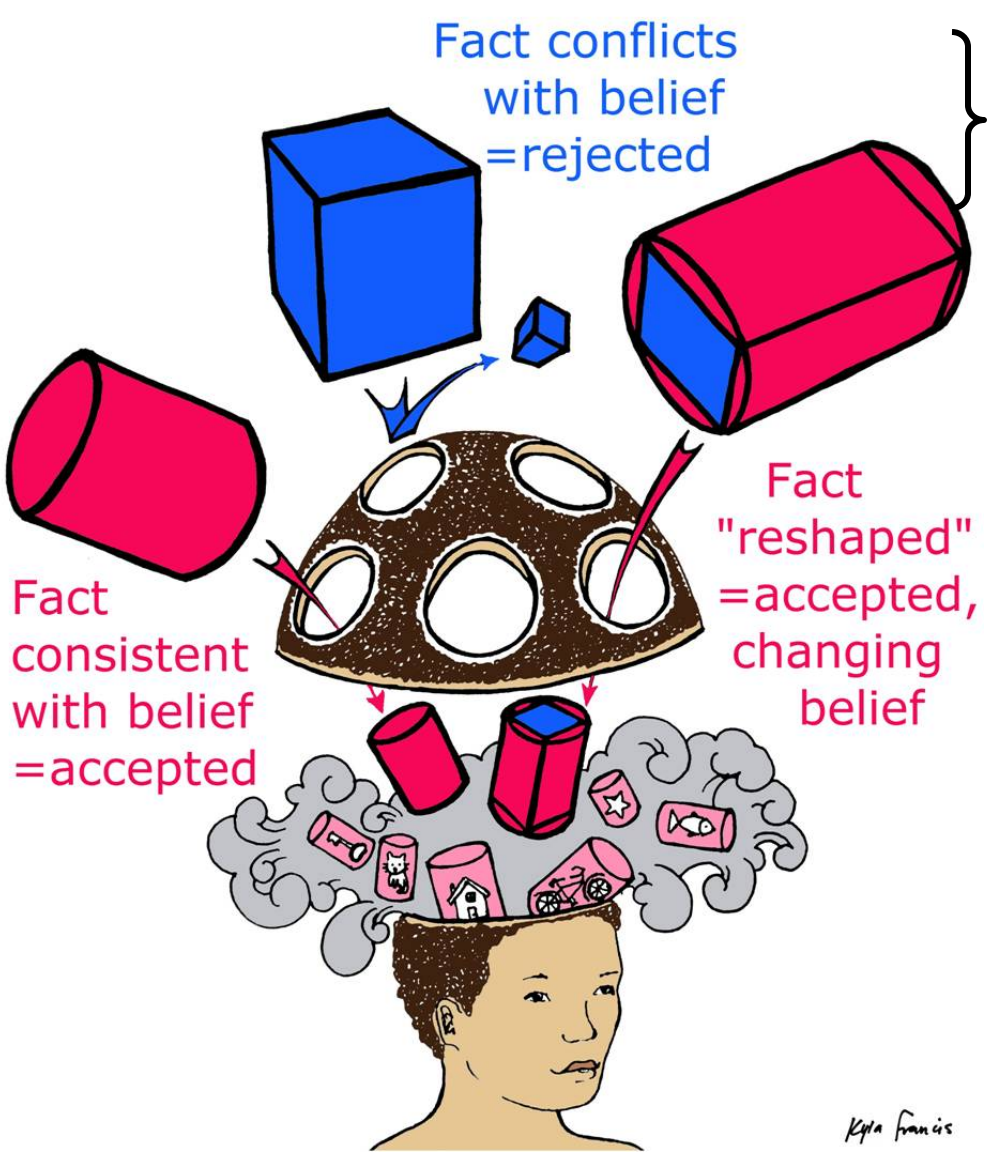


http://www.who.int/immunization/sage/meetings/2014/october/SAGE_working_group_revised_report_vaccine_hesitancy.pdf?ua=1

Vaccine Hesitancy Determinant Categories



SAGE Working Group Vaccine Hesitancy 2014



Do NOT Disturb

Assimilation Bias

Public

HCP

Imm Program

Policy Makers

Nyhan B, Reifler J.. Polit Behav 2010; 32:303–330

Smith, Appleton, MacDonald. Adv in Exp Med Biol 2013; 764: 81-98.

Gunther AC et al CommRes 2012; 39: 439-57

Dandekara P, Goel A, Lee DT. Biased assimilation, homophily, and the dynamics of polarization. Proc Natl Acad Sci USA. 2013 ;110:5791-6.

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 *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"

Nan X, Madden K. Health Commun. 2012 27(8):829-36 .

HPV on YouTube:

2008 review majority +ve

2011 review 1/2 now -ve, 1/3 +ve, rest neutral

Briones R, Nan X, Madden K, Waks L. Health Commun 2012;27:478-85

Medical Conspiracy Theories and Health Behaviors in the United States

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

Medical Conspiracy Narrative	Respondents, %[b] (N = 1351)			
	Heard Before	Agree	Neither Agree nor Disagree	Disagree
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.	63	37	31	32
Health officials know that cell phones cause cancer but are doing nothing to stop it because large corporations won't let them.	57	20	40	40
The CIA deliberately infected large numbers of African Americans with HIV under the guise of a hepatitis inoculation program.	32	12	37	51
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.	19	12	46	42
Doctors and the government still want to vaccinate children even though they know these vaccines cause autism and other psychological disorders.	69	20	36	44
Public water fluoridation is really just a secret way for chemical companies to dump the dangerous byproducts of phosphate mines into the environment.	25	12	41	46

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

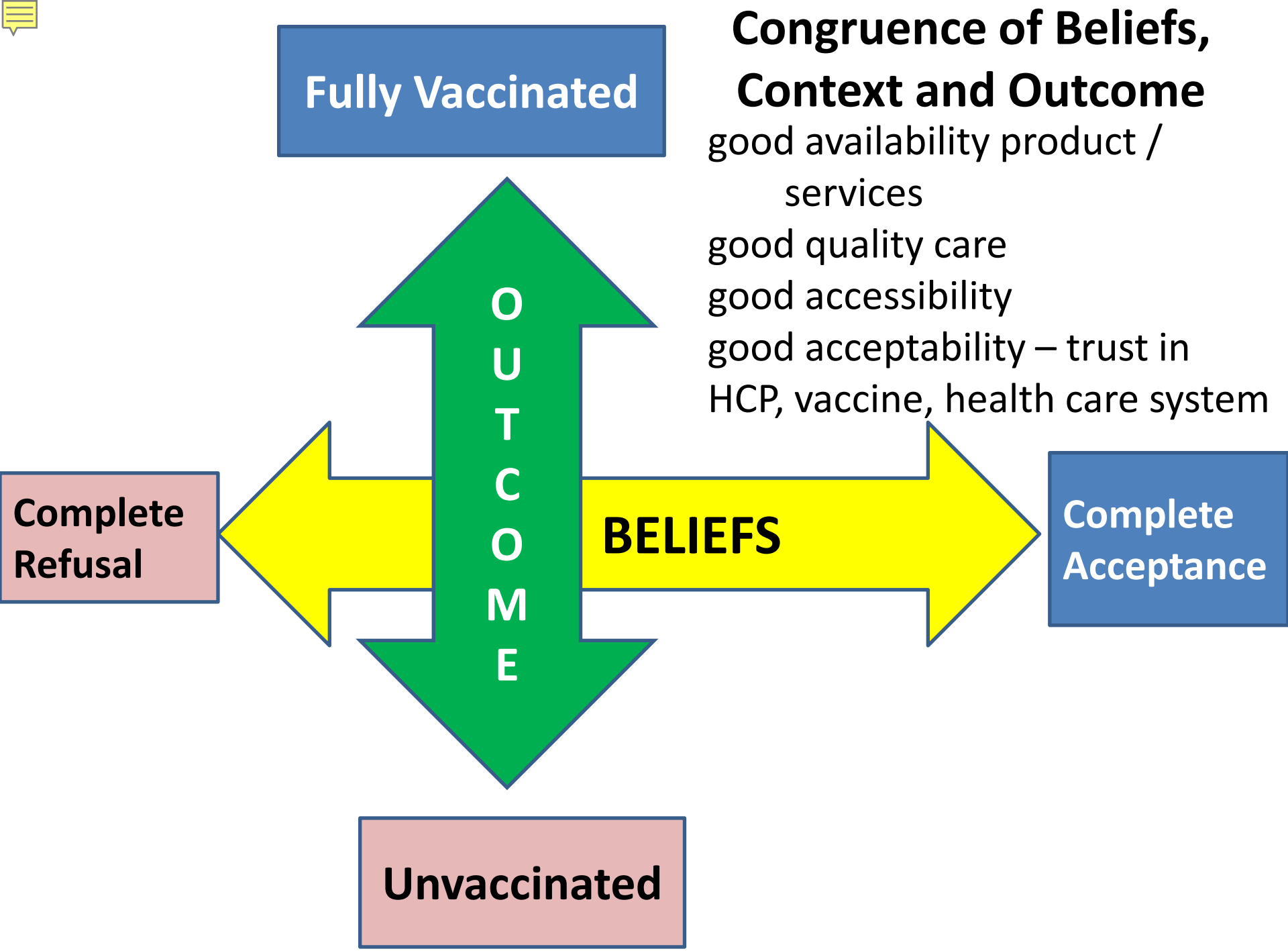
[a] Percentages may not total 100% because of rounding.

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

> Conspiracy beliefs > avoid traditional health care e.g. flu vac

Oliver JE, Wood T. JAMA Intern Med.2014; 174(5):817-8

Congruence of Beliefs, Context and Outcome



good availability product / services
good quality care
good accessibility
good acceptability – trust in HCP, vaccine, health care system

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***

http://www.who.int/immunization/sage/meetings/2014/october/SAGE_working_group_revised_report_vaccine_hesitancy.pdf

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. Effective communication
   e.g. exploit heuristics
4. Reinforce resiliency; impact messages varies
5. Help shape beliefs; work with partners

At individual Level

6. HCP are credible; don't dismiss from your practice
7. Don't underestimate parental value of vaccines
8. *Tell don't ask* strategy
9. Mitigate pain at immunization
10. Clarity language;
    -frame message;
    -emphasize safety;
    -community immunity

and evaluate the outcome

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.

http://www.euro.who.int/__data/assets/pdf_file/0003/187347/The-Guide-to-Tailoring-Immunization-Programmes-TIP.pdf

http://www.who.int/immunization/sage/meetings/2014/october/SAGE_working_group_revised_report_vaccine_hesitancy.pdf?ua=1 Section 5C

Immunization Program Interventions Most Effective on ↑ Vaccine Uptake

KEY: Segment population, individuals:

Diagnose problem and tailor action to fit

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;

SAGE Vax Hes WG 2014

Communications: Effective Tool to Help Address Hesitancy

Effective health communication: Targeted

1. **Be proactive-** not just reactive
   -develop a communication plan
2. **Two way process**: listening and telling
3. **Knowledge** not enough
   -important but insufficient to change behaviour.
   -many models e.g. exploit Cognitive Shortcuts
4. **Tools**: target group- select tools to fit:
   - mass electronic media, digital media,
   - print media, social mobilisation,
   - mobile technology,
   - service oriented communication

Goldstein , MacDonald, Guirguis et al. Health Communication and Vaccine Hesitancy. Vaccine in press

E.g. Exploit Cognitive -Program /Individual Level

Tell compelling stories

HCPs own Or

- *www.immunize.org/reports/*

Parent telling story very powerful

- *www.ovg.ox.ac.uk/meningococcal-disease*

Charlotte Nott's story and video

Anne Geddes

Protecting Our Tomorrows: Portraits of Meningococcal Disease: Anne Geddes

http://www.comomeningitis.org/news-and-events/protecting-our-tomorrow-portraits-of-meningococcal-disease/

http://protectingourtomorrows.tumblr.com

anchor and recall *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*

Internet

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

Impact of Vaccine Messages

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

TABLE 3 Effects of Interventions on MMR Intention

	All	Vaccine Attitudes		
		Least Favorable	Somewhat Favorable	Most Favorable
Autism correction	0.52* (0.32–0.84)	0.36* (0.20–0.64)	1.12 (0.36–3.52)	2.98 (0.48–18.36)
Disease risks	0.98 (0.54–1.77)	0.96 (0.50–1.86)	1.23 (0.29–5.30)	0.82 (0.12–5.45)
Disease narrative	1.09 (0.62–1.94)	0.87 (0.45–1.68)	2.26 (0.60–8.45)	7.29 (0.64–82.77)
Disease images	1.29 (0.73–2.26)	1.20 (0.64–2.26)	2.00 (0.71–5.67)	0.86 (0.09–8.48)
Somewhat favorable toward vaccines (baseline: least favorable)	7.61* (4.74–12.22)			
Most favorable toward vaccines (baseline: least favorable)	16.19* (7.16–36.59)			
N	1751	678	529	544

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*

Shape Young People'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

- Bullying
- Exercise initiatives
- Environmental activism
- Earth Sciences literacy (US) Earth Science Literacy Initiative, *Earth Science Literacy Principles. The Big Ideas and Supporting Concepts of Earth Science*. Online: http://www.earthscienceliteracy.org/es_literacy_6may10_.pdf, 2010.

http://www.who.int/immunization/sage/meetings/2014/october/SAGE_working_group_revised_report_vaccine_hesitancy.pdf?ua=1 *Section 6A.3*

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

At Individual Patent Level: Role MD/HCW

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

Swennen B et al. Vaccine 2002;20 S5-S7. Ansari M et al.. JRSH 2007;127:276-9.
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 & Immunotherapeutics2013; 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

Gust, D.A., et al., Parents with doubts about vaccines: which vaccines and reasons why. Pediatrics, 2008. 122(4): p. 718-25

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 key

Do not Dismiss Children from your Practice over Vaccine Hesitancy or Refusal

Dismiss not prompt parent to immunize and not in best interest of child

Complex legal , ethical and public health issues

Frustrating BUT

Refusers- small minority

- Canada <1-3%

Worth time and effort

– child's best interest

Consider referral to "expert in vaccines" – may refuse….. " *What will it take to get you to a yes*? "

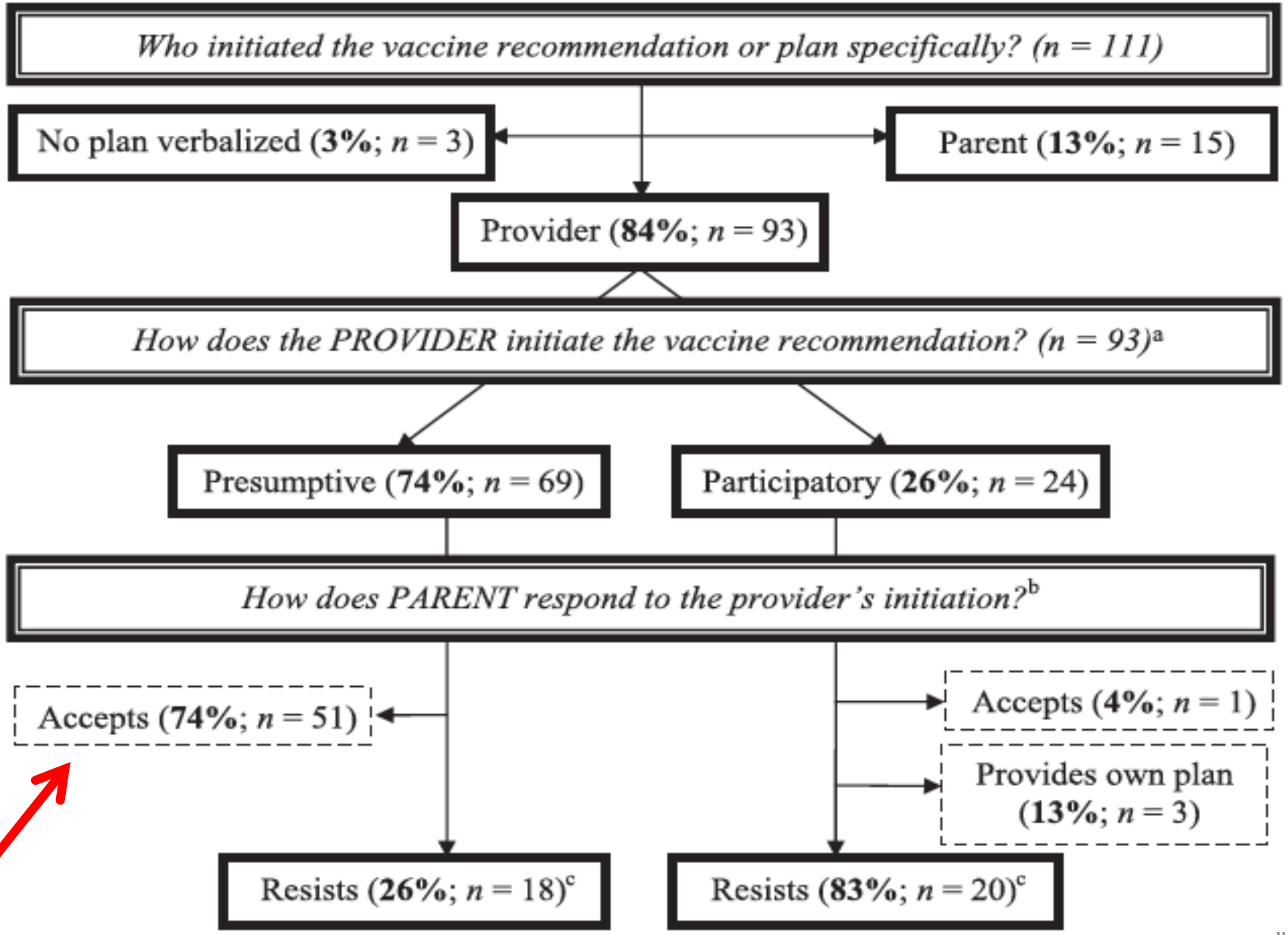
Halperin B, Melnychuk R, Downie J, Macdonald N. Paediatr Child Health 2007;12(10):843-5.

Parent Opinions on Importance Vaccines; Provider Estimate Parental Opinion

Vaccine Importance	Parent N=401	Provider N=105	P value
Child Health	9.5 (0-10)	9.3 (4-10)	<0.001
Meningitis	9.4 (0-10)	9.2 (2-10)	0.002
Hepatitis	9.5 (0-10)	8.7 (3-10)	<0.001
Rotavirus	9.0 (0-10)	8.4 (2-10)	0.535
Pertussis	9.5 (0-10)	9.3 (0-10)	0.006
Influenza	9.3(0-10)	7.0 (1-10)	<0.001
HPV	9.2 (0-10)	5.2 (0-10)	<0.001

Healey CM et al. Parent and provider perspectives on immunization: Are providers overestimating parental concerns? Vaccine 2014;32: 579–584

Tell- Don't Ask: Vaccine Hesitancy Study



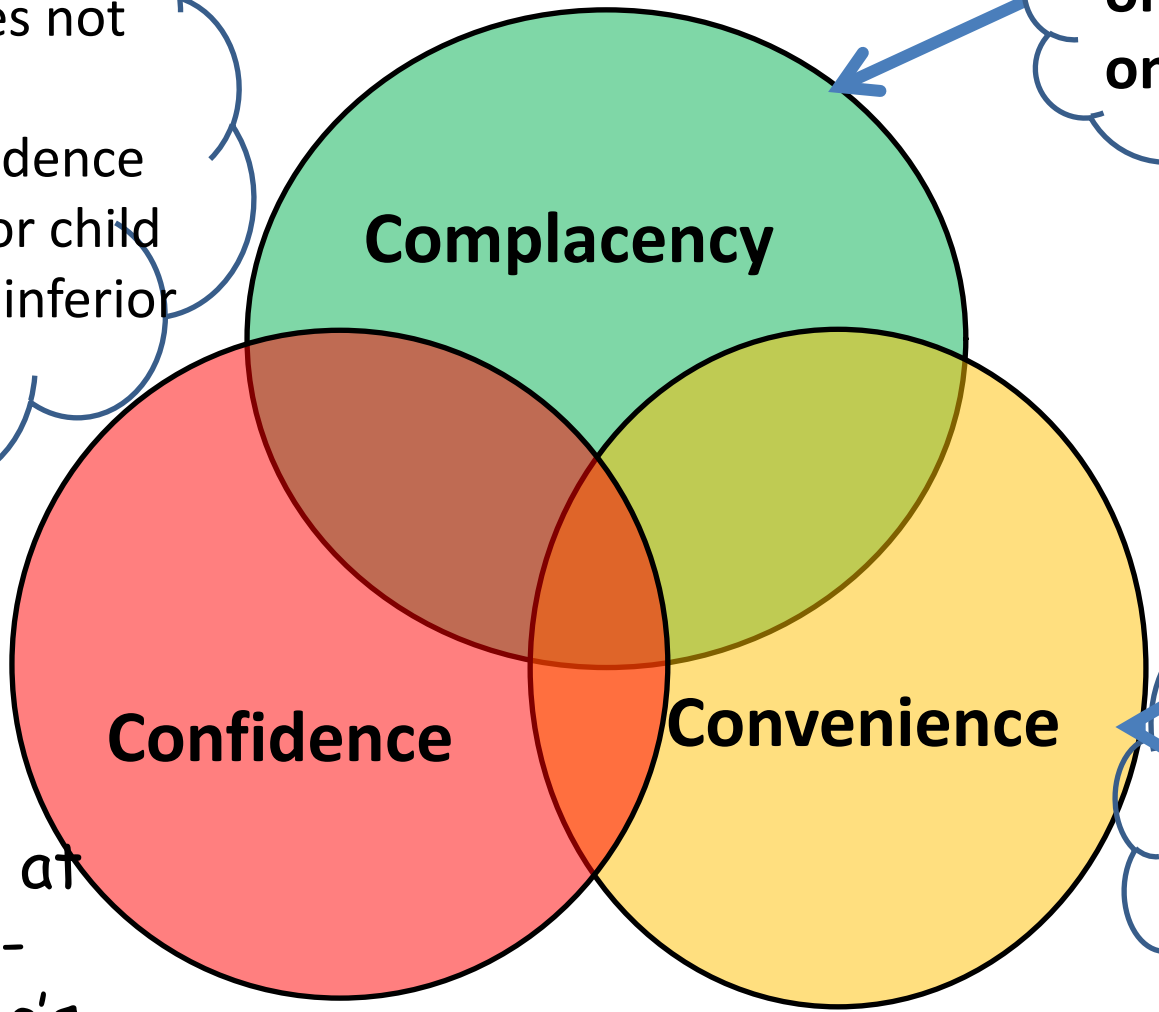
Opel et al Pediatrics 2013; 132: 1037-46.

Hesitancy – not on Schedule

Listen and check 3 C's:

Off schedules not tested
Give best evidence based care for child
Not practice inferior medicine

Importance on schedule, on time



Access, clinic times, costs

Address Pain at immunization- crosses all 3 c's

Address Pain Mitigation

Vaccine Pain

Concerns

patient, parent , HCP

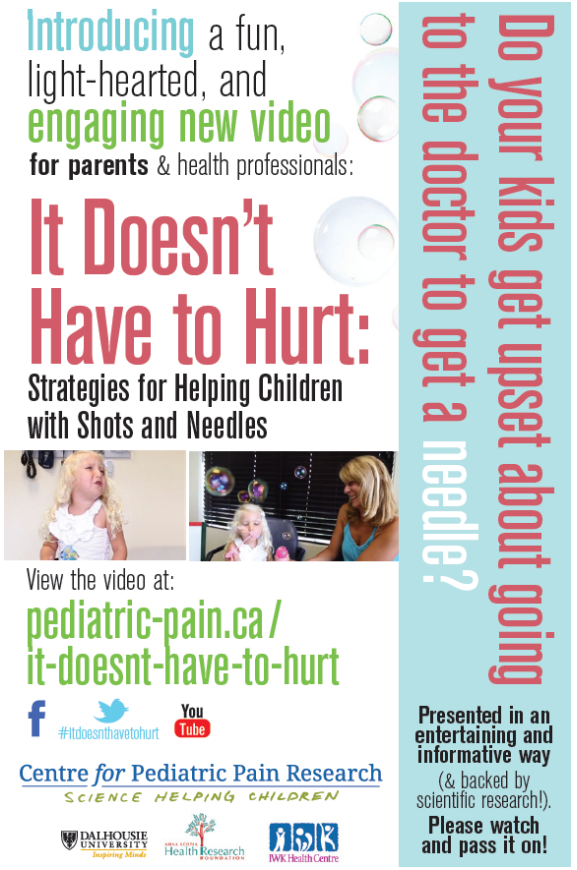
44% parents*

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

measures to mitigate imp

perception of benefit

anchor and recall



Evidence based Immunization Pain Mitigation Guidelines

Taddio et al. CMAJ 2010. 182(18):1989-95 .

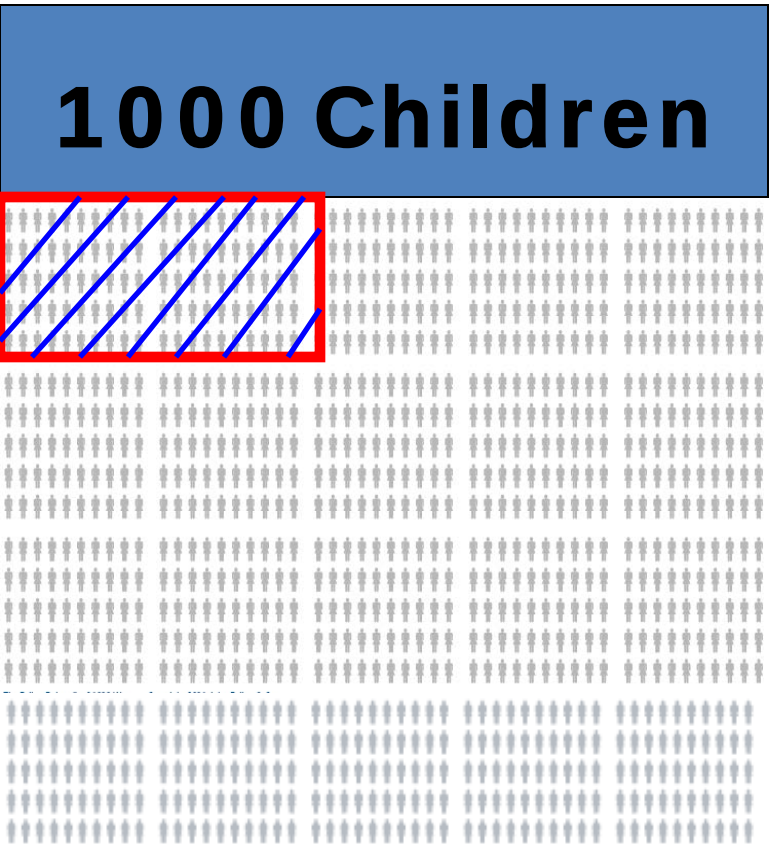
Being updated …..

WHO recommendations coming

http://www.youtube.com/watch?v=KgBwVSYqfps

http://pediatric-pain.ca/it-doesnt-have-to-hurt

Use Clear Language



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

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

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

Tversky A, Kahneman D. The framing of decisions and the psychology of choice. Science 1981;211(4481):453-8.

Levin IP, Schneider SL, Gaeth GJ. All Frames Are Not Created Equal: A Typology and Critical Analysis of Framing Effects. Organ Behav Hum Decis Process 1998;76:149–188

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!

Gerend MA, Shepherd MA, Shepherd JE Health Psychol. 2011;32:361-9.
Sandell T et al Scandinavian Journal of Public Health, 2013; 41: 860–865
NACI Canada. Canadian Immunization Guide http://www.phac-aspc.gc.ca/publicat/cig-gci/p04-meni-eng.php#a9

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 (EMA, Country NITAG)
8. International collaboration (WHO/GACVS)

Safer than Drugs

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

Community Protection: Herd Immunity

https://www.ted.com/talks/romina_libster_the_power_of_herd_immunity

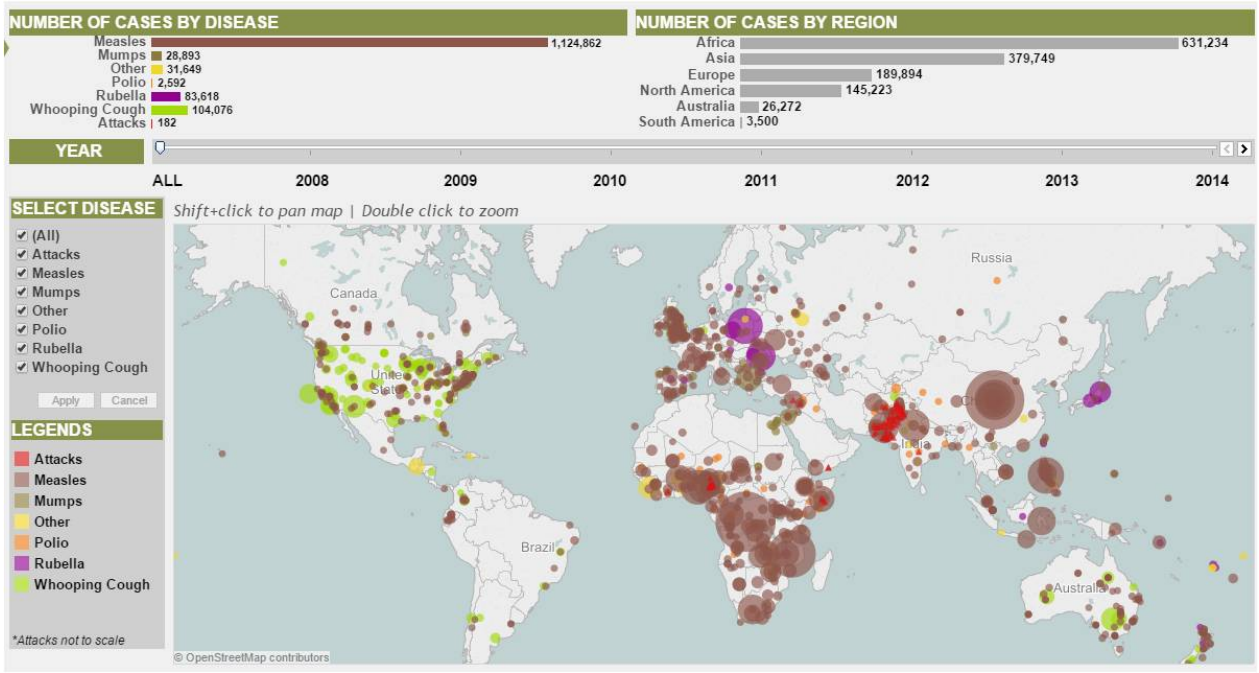
Vaccine Hesitancy

Global problem that *is* ***complex*** *and* ***context specific***
varying across ***time***, ***place*** *and* ***vaccines***

Approach to Hesitancy :

- Diagnosis-
  - understand determinants hesitant subgroup/ individual;
- Tailor strategy to fit;
- Assess outcome;
- Support resiliency of those who are pro-vaccine
- Work for next generation to be pro-vaccine

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



http://www.huffingtonpost.com/2014/10/27/anti-vaccine-disease-outbreaks_n_6056862.html

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. #GrandmothersKnowBest

Vaccine Communication Resources

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.euro.who.int/en/what-we-do/health-topics/disease-prevention/vaccines-and-immunization/immunization-resource-centre
www.bccdc.ca/NR/rdonlyres/DADA3304-7590-48AC-8D2C-65D54ADFC77E/0/CDC_IC_Tool.pdf
http://www.bccdc.ca/dis-cond/comm-manual/CDManualChap2.htm
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
http://www.who.int/immunization/sage/meetings/2014/october/SAGE_working_group_revised_report_vaccine_hesitancy.pdf