Addressing Vaccine Hesitancy in a Changing World

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Finger Lakes Area Immunization Coalition
2019 Annual Conference

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OBJECTIVES

- Describe the epidemiology of vaccine hesitancy and identify key factors associated with the decision to accept, delay or refuse vaccines
- Identify potential communication and policy approaches to address vaccine hesitancy
- Review ethical considerations and current evidence in support of strategies to address vaccine hesitancy

2019 VACCINE SCHEDULE: CHILD

Table 1 Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger United States, 2019

These recommendations must be read with the Notes that follow. For those who fall behind or start late, provide catch-up vaccination at the earliest opportunity as indicated by the green bars in Table 1. To determine minimum intervals between doses, see the catch-up schedule (Table 2). School entry and adolescent vaccine age groups are shaded in gray.

Vaccine	Birth	1 mo	2 mos	4 mos	6 mos	9 mos	12 mos	15 mos	18 mos	19-23 mos	2-3 yrs	4-6 yrs	7-10 yrs	11-12 yrs	13-15 yrs	16 yrs	17-18 yrs
Hepatitis B (HepB)	1st dose	2nd dose			3rd dose												
Rotavirus (RV) RV1 (2-dose series); RV5 (3-dose series)			1st dose	2nd dose	See Notes												
Diphtheria, tetanus, & acellular pertussis (DTaP: <7 yrs)			1st dose	2nd dose	3rd dose			4th dose				5th dose					
Haemophilus influenzae type b (Hib)			1st dose	2nd dose	See Notes		3rd or 4th dose, See Notes										
Pneumococcal conjugate (PCV13)			1st dose	2nd dose	3rd dose		4th dose										
Inactivated poliovirus (IPV: <18 yrs)			1st dose	2nd dose	3rd dose							4th dose					
Influenza (IIV) or Influenza (LAIV)					Annual vaccination 1 or 2 doses						Annual vaccination 1 or 2 doses			Annual vaccination 1 dose only			
Measles, mumps, rubella (MMR)					See Notes		1st dose					2nd dose					
Varicella (VAR)							1st dose					2nd dose					
Hepatitis A (HepA)					See Notes		2-dose series, See Notes										
Meningococcal (MenACWY-D ≥9 mos; MenACWY-CRM ≥2 mos)			See Notes											1st dose		2nd dose	
Tetanus, diphtheria, & acellular pertussis (Tdap: ≥7 yrs)														Tdap			
Human papillomavirus (HPV)														See Notes			
Meningococcal B													See Notes				
Pneumococcal polysaccharide (PPSV23)											See Notes						

Range of recommended ages for all children

Range of recommended ages for catch-up immunization

Range of recommended ages for certain high-risk groups

Range of recommended ages for non-high-risk groups that may receive vaccine, subject to individual clinical decision-making

No recommendation

IMPACT OF VACCINES

DISEASE	PRE-VACCINE ERA ESTIMATED ANNUAL MORBIDITY*	MOST RECENT REPORTS OR ESTIMATES† OF U.S. CASES	PERCENT DECREASE
Diphtheria	21,053	0†	100%
H. influenzae (invasive, <5 years of age)	20,000	31‡	>99%
Hepatitis A	117,333	2,890§	98%
Hepatitis B (acute)	66,232	18,800§	72%
Measles	530,217	187†	>99%
Mumps	162,344	584†	>99%
Pertussis	200,752	28,639†	86%
Pneumococcal disease (invasive, <5 years of age)	16,069	1,900‡‡	88%
Polio (paralytic)	16,316	1†	>99%
Rotavirus (hospitalizations, <3 years of age)	62,500**	12,500††	80%
Rubella	47,745	9†	>99%
Congenital Rubella Syndrome	152	1†	99%
Smallpox	29,005	0†	100%
Tetanus	580	26†	96%
Varicella	4,085,120	167,490§§	96%

www.immunize.org/catg.d/p4037.pdf
Item #P4037 (12/14)

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PREVENT 42,000 EARLY DEATHS and 20 MILLION CASES OF DISEASE

SAVE $13.5 BILLION IN DIRECT COSTS

www.immunize.org/catg.d/p4037.pdf ; Haskell J, Edwards K, Pediatrics 2016

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EPIDEMIOLOGY OF VACCINE HESITANCY

- Majority of US adults believe vaccination is extremely or very important BUT…
  - Increasing proportion believe vaccines are more dangerous than diseases
- Majority of physicians report >1 vaccine refusal / month
- 13% children under-vaccinated due to parental choice
- Growing number of pediatricians always / often accept requests for delay (13 → 37%)

Glanz JM *JAMA Pediatr.* 2013;167(3):274-281; Gowda, etal. Hum Vac Imm, 2013; Kempe A *Pediatrics.* 2015

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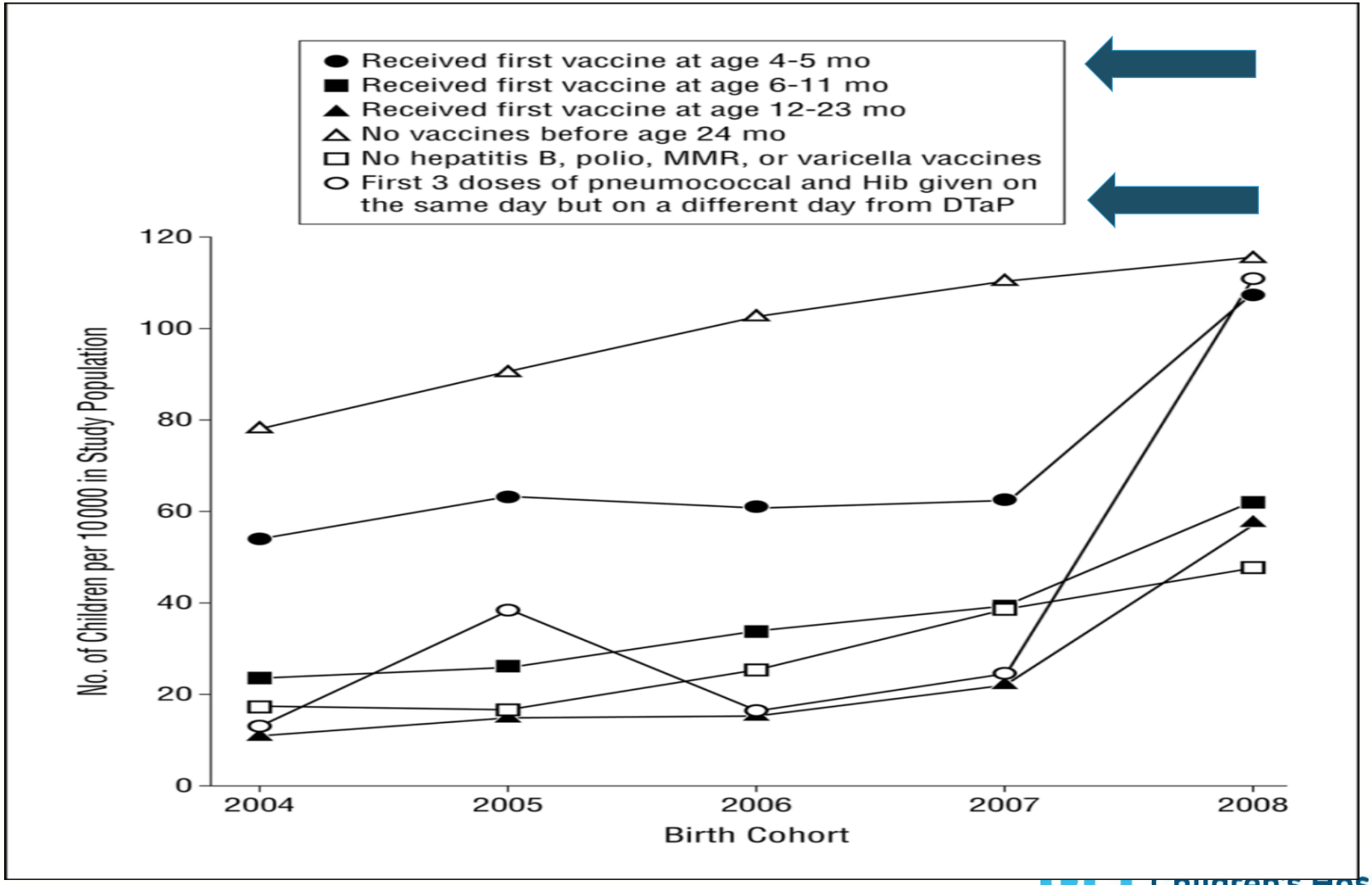
EPIDEMIOLOGY OF VACCINE HESITANCY

Patterns of Vaccine Receipt: 2004-2008 Birth Cohorts



Glanz JM *JAMA Pediatr.* 2013;167(3):274-281

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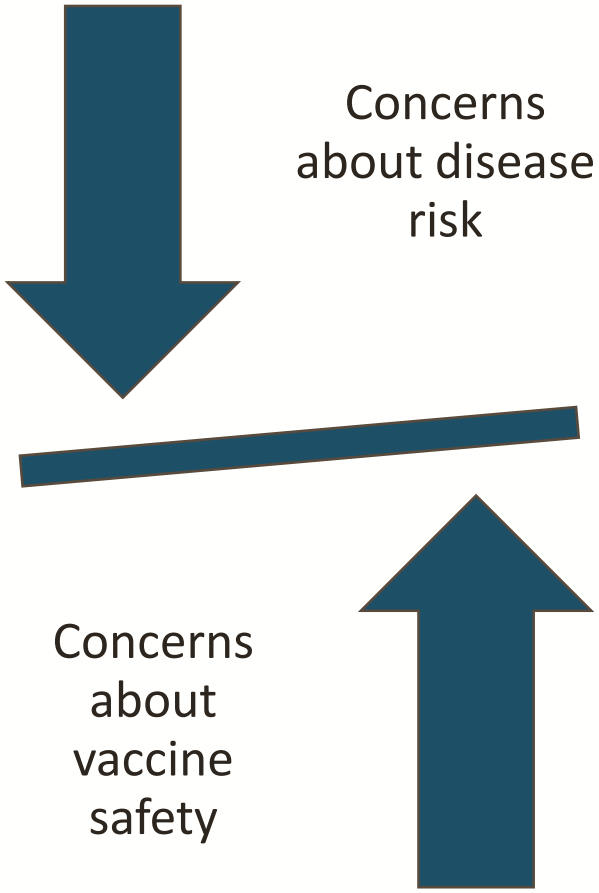
A CONSEQUENCE OF SUCCESS



- Low perceived risk of VPD's and underappreciation of transmission risks
- Underappreciation of disease severity
- Easy access to misinformation → persistent vaccine safety concerns

A CONSEQUENCE OF SUCCESS AND CHANGING TIMES

- Distrust and scientific denialism
- Rapid dissemination of information
- Naturalism
- Changes in Decision-making

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VACCINE REFUSAL AND MEASLES

- **Review of 18 published measles studies (1416 cases) through November 2015**
  - 56.8% no history of measles vaccination
  - 16.3% unknown vaccination status
  - 14.1% vaccinated
  - Of 574 unvaccinated individuals who were age-eligible for vaccine, 70.6% unvaccinated due to NON-MEDICAL exemption
  - Children with vaccine exemptions at significantly higher risk for acquiring measles compared to fully vaccinated children (35x)

*Phadke VK, etal. JAMA 2016;315(11):1149-58.

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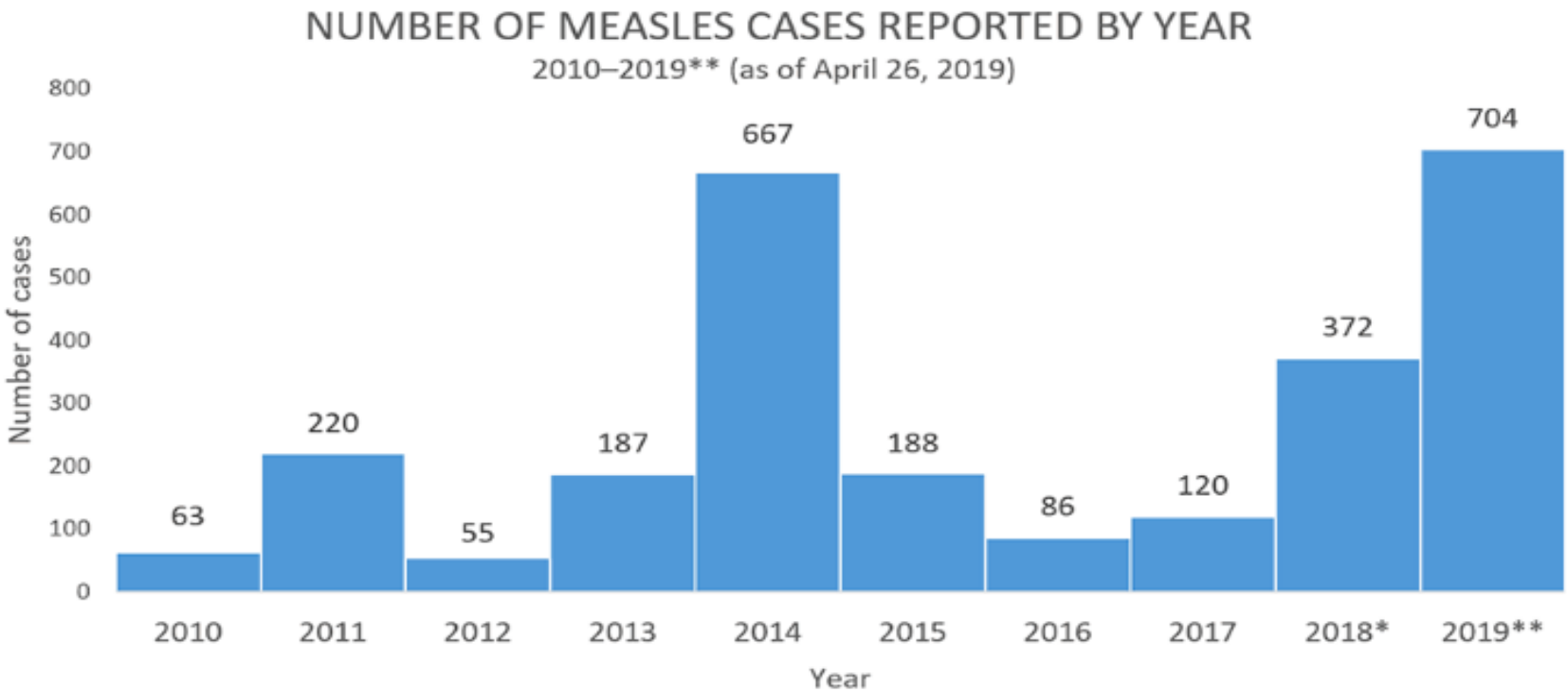
MEASLES IN THE U.S.: 2019

The states that have reported cases to CDC are Arizona, California, Colorado, Connecticut, Florida, Georgia, Illinois, Indiana, Iowa, Kentucky, Maryland, Massachusetts, Michigan, Missouri, Nevada, New Hampshire, New Jersey, New York, Oregon, Texas, Tennessee, and Washington.



*Cases as of December 29, 2018. Case count is preliminary and subject to change.

Cases as of April 26, 2019. Case count is preliminary and subject to change. **Data are updated every Monday.

https://www.cdc.gov/measles/cases-outbreaks.html

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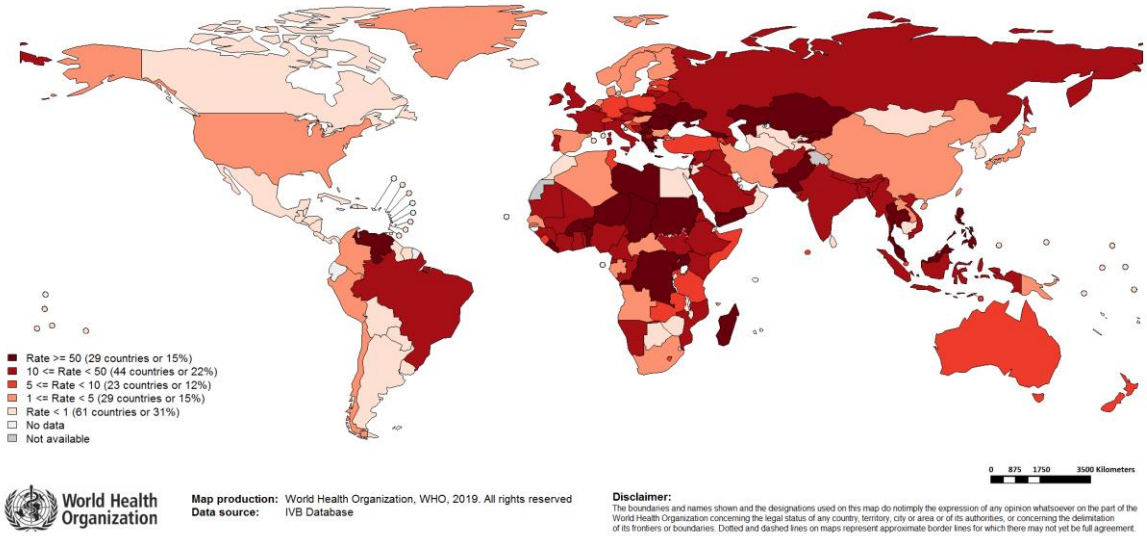
MEASLES INCIDENCE RATE PER MILLION: (12M PERIOD)

Top 10**		
Country	Cases	Rate
Ukraine	63948	1439.02
India	63364	47.85
Madagascar	59407	2386.35
Pakistan	30747	159.14
Philippines	19401	187.78
Yemen	11746	425.82
Brazil	10262	49.42
Nigeria	5847	31.44
Venezuela (Bolivarian Republic of)	5668	179.55
Thailand	5579	81.02

Other countries with high incidence rates***		
Country	Cases	Rate
Georgia	3176	809.09
Liberia	3194	692.27
Albania	1476	504.38
Serbia	4176	473.46
Israel	3377	412.24
Montenegro	201	319.75
Kyrgyzstan	1509	253.37



Measles cases from countries with known discrepancies between case-based and aggregate surveillance, as reported by country			
Country	Year	Cases	Data Source
DR Congo	2018	67072	SITUATION EPIDEMIOLOGIQUE DE LA ROUGEOLE EN RDC, Week of 05/03/2019
	2019	17646	
Somalia	2018	9135	Somali EPI/POL Weekly Update Week 09
	2019	720	

Notes: Based on data received 2019-03 and covering the period between 2018-02 and 2019-01 - Incidence: Number of cases / population* * 100,000 - * World population prospects, 2017 revision - ** Countries with the highest number of cases for the period - *** Countries with the highest incidence rates (excluding those already listed in the table above)

WHY IS MEASLES RE-EMERGING: A CONFLUENCE OF FACTORS

- Globalization
  - Measles endemic in many countries → majority of US cases imported
- High transmissibility of measles virus
  - Almost all unvaccinated, susceptible individuals exposed to measles will be infected
- Increasing rates of vaccine refusal
  - Majority of affected individuals in current outbreaks unvaccinated, often due to parental choice

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DEFINING VACCINE HESITANCY

- WHO Strategic Advisory Group of Experts on Immunization and the National Vaccine Advisory Committee established vaccine hesitancy working groups

- Define Vaccine Hesitancy
- Model Determinants of Vaccine Hesitancy
- Identify Strategies to Measure and Address Hesitancy

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SAGE WORKING GROUP

- Vaccine hesitancy is a behavior influenced by a number of factors including issues of **confidence, complacency**, and **convenience**.

- Vaccine-hesitant individuals are a **heterogeneous group** who hold varying degrees of indecision about specific vaccines or vaccination in general.

- Vaccine hesitant individuals **may accept** all vaccines but **remain concerned** about vaccines*;* some **may refuse or delay some** vaccines, but accept others; some individuals **may refuse all** vaccines.

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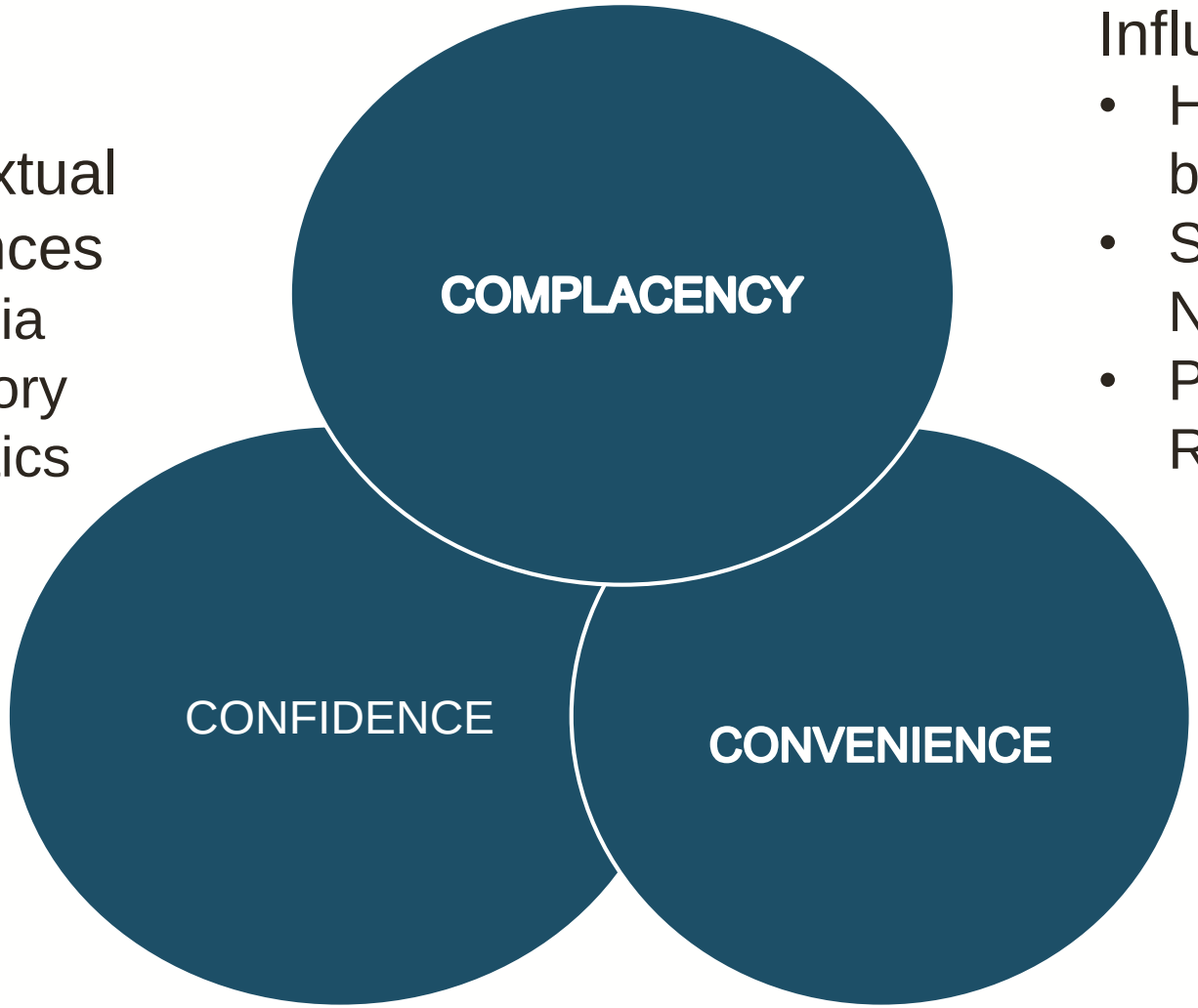
SAGE MODEL

Contextual Influences
- Media
- History
- Politics



Individual / Group Influences
- Health beliefs
- Social Norms
- Perceived Risk

Vaccine Specific Issues
- Cost
- Schedule
- Delivery

Adapted from MacDonald NE, SAGE Working Group on Vaccine Hesitancy; Vaccine 33 (2015).

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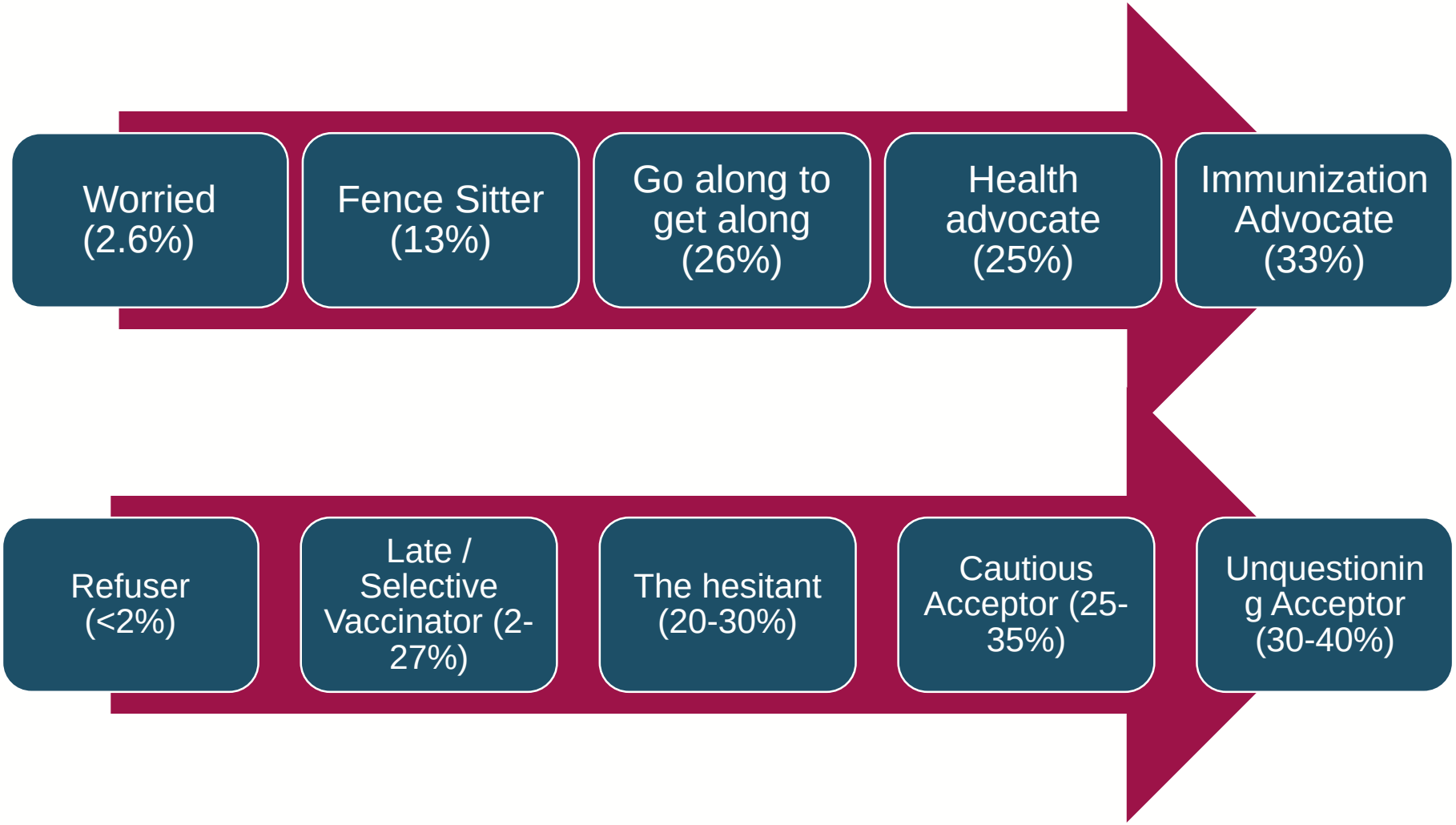
THE SPECTRUM OF VACCINE ACCEPTANCE



Gust DA, et al. Am J Health Behavior, 2005,29;
Leask J, etal. BMC Pediatrics. 2012, 12.

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ADDRESSING HESITANCY

COMMUNICATION AND POLICY

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ADDRESSING HESITANCY…THERE IS A LOT TO LEARN

- SAGE vaccine hesitancy working group: few studies measuring impact on vaccine uptake or knowledge
- Multicomponent strategies (mass media, nonfinancial incentives, reminders) and dialogue-based communication most effective
- 2015 systematic review of reviews: no strong evidence to support any specific intervention to address hesitancy
- National Vaccine Program Office focus group with vaccine hesitant mothers: many different sources shape beliefs → no single approach worked well for everyone

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PROVIDER RECOMMENDATION MATTERS

Provider beliefs associated with beliefs of parents of vaccinated and unvaccinated children

- Be proactive
- Find a common ground
- Use numbers to communicate risk and provide perspective
- Use personal stories
- Know the vaccine- acknowledge known side effects but also emphasize evidence supporting safety and benefit
- Know about additional resources
- Make recommendation strong and consistent

Healy CM, etal Pediatrics 2011;127 Suppl 1:S127-33; Offit PA, Coffin SE. Vaccine 2003;22:1616; Tumbull AE. Health Commun 2011;26:775-6.; Macdonald NE, etal.. Biologicals 2011.; Daley MF, etal. Sci Am 2011;305:82, 4.

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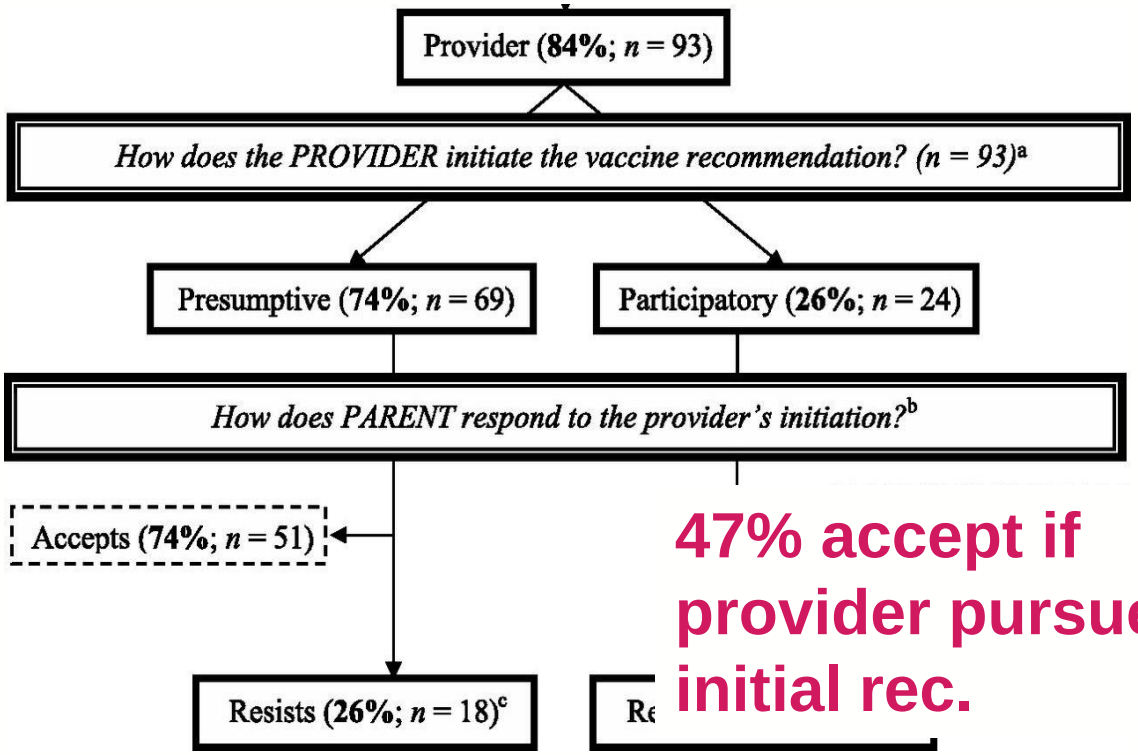
A STRONG RECOMMENDATION CAN DRIVE ACCEPTANCE



47% accept if provider pursues initial rec.

- Parents in participatory approach group significantly more likely to resist vaccine recommendation compared to presumptive approach group **(83% vs 26%)**

Opel DJ, etal. Pediatrics 2013

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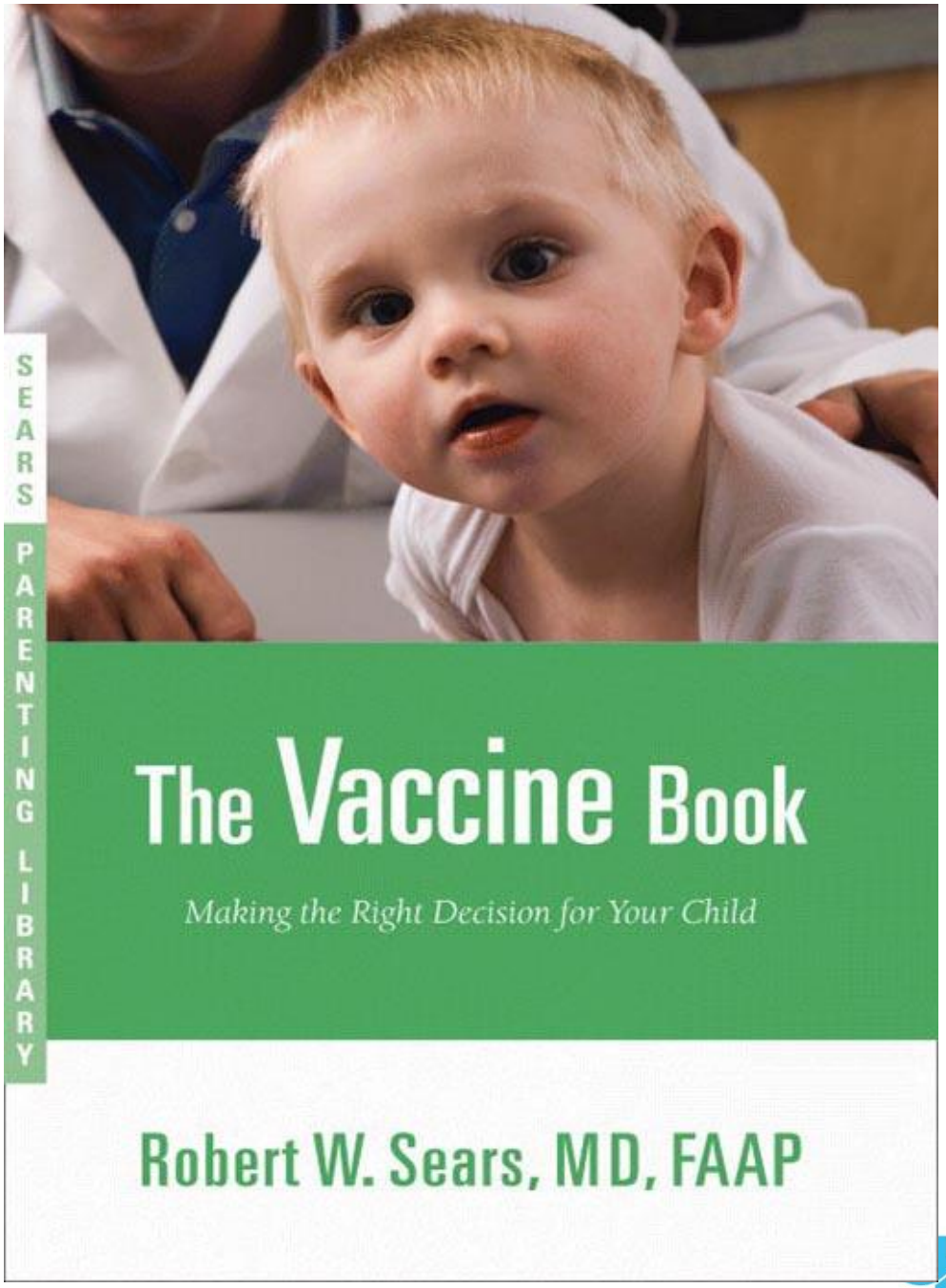
- Parent of a 12 month old is coming to your practice for the first time. The child is due for all of her 1 year vaccines. When you start your recommendation, the parent stops you and says: ‘we are definitely not doing all of these vaccines today- it is too much for my child’s immune system and too many injections.’



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ADDRESSING COMMON CONCERNS AND MISPERCEPTIONS

- Vaccine safety concerns about long term side effects or specific outcomes like autism
- Low perceived risk of child contracting a vaccine preventable disease
- Concern that vaccination will affect immune system
- Concerns about vaccine additives
- Parents' desire to be involved in child's medical care
- Freedom of choice

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THE SCHEDULE HAS CHANGED…

Year	Vaccines	# shots by 2 years of age	# shots at one time
1900	Smallpox	1	1
1980	DTwP, Polio (OPV) MMR	5	2
2011	DTaP, Polio (IPV) MMR, Varicella Hib, Pneumococcal conj. Hepatitis A and B Influenza, Rotavirus	26	5

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AREN'T ALL THESE VACCINES TOO MUCH FOR AN INFANT'S IMMUNE SYSTEM?

Fewer immunologic components in vaccines today - much smaller antigen load than what infants confront each day

- 1900: 200 antigens →
- 1980: ~3,000 antigens →
- **2012: ~150 antigens**

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THAT STILL SEEMS LIKE A LOT - CAN INFANTS HANDLE 150 ANTIGENS?

- From birth, infants are challenged by bacteria in the environment (colonizing bacteria on intestines, skin, and throat; bacteria inhaled on dust).
- Vigorous sIgA responses within the first week of life keeps colonizing bacteria from invading.
- Study showing that two shots are not more likely to induce cortisol (as a marker for stress) than one shot.

WHAT ABOUT VACCINE ADDITIVES?

Preservatives	• Phenol, thimerosal • Prevent contamination, important for multidose vials
Stabilizers	• Sugars, amino acids, proteins • Prevent antigens from degrading, especially during temperature changes
Inactivating agents	• Ex. Formaldehyde • Inactivate a virus, bacteria or toxoid during production • Removed after production
Adjuvants	• Aluminum salts most widely used • Enhance immune response for vaccines that use only a few antigens (not needed for attenuated or whole cell inactivated vaccines)

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ARE THESE INGREDIENTS SAFE?

- Adjuvants, preservative and inactivating agents necessary for vaccine safety and effectiveness
- Use of additives strictly regulated by FDA → type and amount must be listed on label
- Aluminum and mercury in environment and formaldehyde is a necessary part of human metabolic pathways
- No evidence that exposure causes toxicity or illness

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HOW CAN YOU BE SURE ALL OF THESE VACCINES ARE SAFE FOR MY CHILD?

- Safety is a key part of vaccine development: benefits need to clearly outweigh risks
- Need to know potential side effects
  - Minor: injection site pain
  - Major: Thrombocytopenia from measles vaccine
- Put risk in perspective, compared to every day activities (driving, biking, jungle gym)
- Know each vaccines profile, or give parents information at a visit prior so they can be informed

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VACCINE MANUFACTURING

Exploratory

- Basic research to find antigens
- Academic / gov't scientists
- 2-4 years

Pre-Clinical

- Animal testing to evaluate safety and immunogenicity of candidate vaccine
- Private industry
- 1-2 years

Clinical Studies

- Phase I: safety and immunogenicity, 20-80 subjects
- Phase II: randomized trials, safety and immunogenicity, schedule and dosing, 200+ subjects
- Phase III: large trials (thousands of subjects), safety and efficacy

Application for licensure

Majority of vaccine candidates never progress beyond pre-clinical stage

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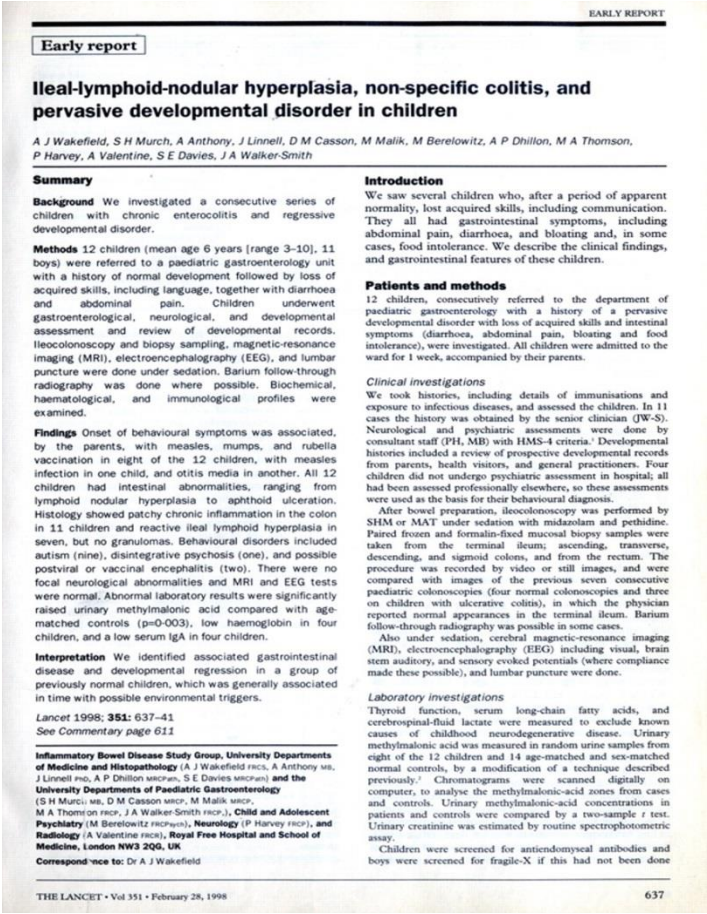
VACCINE SAFETY INFRASTRUCTURE

- Vaccine Adverse Events Reporting System
  - Passive – reported events only, does NOT establish causation
  - ~30,000 reported events / year → ~90% mild (10 million vaccine doses for children / year)
- Vaccine Safety Datalink
  - Active surveillance for specific outcomes
  - 9 managed care associations, 9 million children and adults
- Clinical Immunization Safety Assessment Network (CISA)
  - 7 academic centers
  - Identifies who is at risk for serious adverse events
- Post-licensure Rapid Immunization Safety Monitoring (PRISM)
  - Links EHRs with immunization registries

WHAT ABOUT AUTISM?



Early report

Ileal-lymphoid-nodular hyperplasia, non-specific colitis, and pervasive developmental disorder in children

A J Wakefield, S H Murch, A Anthony, J Linnell, D M Casson, M Malik, M Berelowitz, A P Dhillon, M A Thomson, P Harvey, A Valentine, S E Davies, J A Walker-Smith

Summary

Background We investigated a consecutive series of children with chronic enterocolitis and regressive developmental disorder.

Methods 12 children (mean age 6 years [range 3–10], 11 boys) were referred to a paediatric gastroenterology unit with a history of normal development followed by loss of acquired skills, including language, together with diarrhoea and abdominal pain. Children underwent gastroenterological, neurological, and developmental assessment and review of developmental records. Ileocolonoscopy and biopsy sampling, magnetic-resonance imaging (MRI), electroencephalography (EEG), and lumbar puncture were done under sedation. Barium follow-through radiography was done where possible. Biochemical, haematological, and immunological profiles were examined.

Findings Onset of behavioural symptoms was associated, by the parents, with measles, mumps, and rubella vaccination in eight of the 12 children, with measles infection in one child, and otitis media in another. All 12 children had intestinal abnormalities, ranging from lymphoid nodular hyperplasia to aphthoid ulceration. Histology showed patchy chronic inflammation in the colon in 11 children and reactive ileal lymphoid hyperplasia in seven, but no granulomas. Behavioural disorders included autism (nine), disintegrative psychosis (one), and possible postviral or vaccinal encephalitis (two). There were no focal neurological abnormalities and MRI and EEG tests were normal. Abnormal laboratory results were significantly raised urinary methylmalonic acid compared with age-matched controls (p=0·003), low haemoglobin in four children, and a low serum IgA in four children.

Interpretation We identified associated gastrointestinal disease and developmental regression in a group of previously normal children, which was generally associated in time with possible environmental triggers.

Lancet 1998; **351:** 637–41

See Commentary page 611

Inflammatory Bowel Disease Study Group, University Departments of Medicine and Histopathology (A J Wakefield FRCS, A Anthony MB, J Linnell PhD, A P Dhillon MRCPath, S E Davies MRCPath) **and the University Departments of Paediatric Gastroenterology** (S H Murch MB, D M Casson MRCP, M Malik MRCP, M A Thomson FRCP, J A Walker-Smith FRCP), **Child and Adolescent Psychiatry** (M Berelowitz FRCPsych), **Neurology** (P Harvey FRCP), **and Radiology** (A Valentine FRCR), **Royal Free Hospital and School of Medicine, London NW3 2QG, UK**

Correspondence to: Dr A J Wakefield

Introduction

We saw several children who, after a period of apparent normality, lost acquired skills, including communication. They all had gastrointestinal symptoms, including abdominal pain, diarrhoea, and bloating and, in some cases, food intolerance. We describe the clinical findings, and gastrointestinal features of these children.

Patients and methods

12 children, consecutively referred to the department of paediatric gastroenterology with a history of a pervasive developmental disorder with loss of acquired skills and intestinal symptoms (diarrhoea, abdominal pain, bloating and food intolerance), were investigated. All children were admitted to the ward for 1 week, accompanied by their parents.

Clinical investigations

We took histories, including details of immunisations and exposure to infectious diseases, and assessed the children. In 11 cases the history was obtained by the senior clinician (JW-S). Neurological and psychiatric assessments were done by consultant staff (PH, MB) with HMS-4 criteria.[1] Developmental histories included a review of prospective developmental records from parents, health visitors, and general practitioners. Four children did not undergo psychiatric assessment in hospital; all had been assessed professionally elsewhere, so these assessments were used as the basis for their behavioural diagnosis.

After bowel preparation, ileocolonoscopy was performed by SHM or MAT under sedation with midazolam and pethidine. Paired frozen and formalin-fixed mucosal biopsy samples were taken from the terminal ileum; ascending, transverse, descending, and sigmoid colons, and from the rectum. The procedure was recorded by video or still images, and were compared with images of the previous seven consecutive paediatric colonoscopies (four normal colonoscopies and three on children with ulcerative colitis), in which the physician reported normal appearances in the terminal ileum. Barium follow-through radiography was possible in some cases.

Also under sedation, cerebral magnetic-resonance imaging (MRI), electroencephalography (EEG) including visual, brain stem auditory, and sensory evoked potentials (where compliance made these possible), and lumbar puncture were done.

Laboratory investigations

Thyroid function, serum long-chain fatty acids, and cerebrospinal-fluid lactate were measured to exclude known causes of childhood neurodegenerative disease. Urinary methylmalonic acid was measured in random urine samples from eight of the 12 children and 14 age-matched and sex-matched normal controls, by a modification of a technique described previously.[2] Chromatograms were scanned digitally on computer, to analyse the methylmalonic-acid zones from cases and controls. Urinary methylmalonic-acid concentrations in patients and controls were compared by a two-sample *t* test. Urinary creatinine was estimated by routine spectrophotometric assay.

Children were screened for antiendomyseal antibodies and boys were screened for fragile-X if this had not been done

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VACCINES AND AUTISM

- 1998 publication in *The Lancet* by Wakefield, etal linking autism and MMR based upon case series of 12 patients
  - Vaccine causes bowel inflammation letting brain-damaging proteins circulate

- Study retracted and findings refuted by multiple studies that have shown no evidence of this link[1]

- Concern has shifted to thimerosal and mercury
- No link found in multiple studies AND even after thimerosal removed from vaccines, autism rates have increased

Dales, etal. JAMA 2001; D'Souza etal. Pediatrics 2006; Farrington, etal. Vaccine 2001; Madsen etal, NEJM 2002, Taylor, etal. BMJ 2002; Taylor, etal. Lancet 1999.

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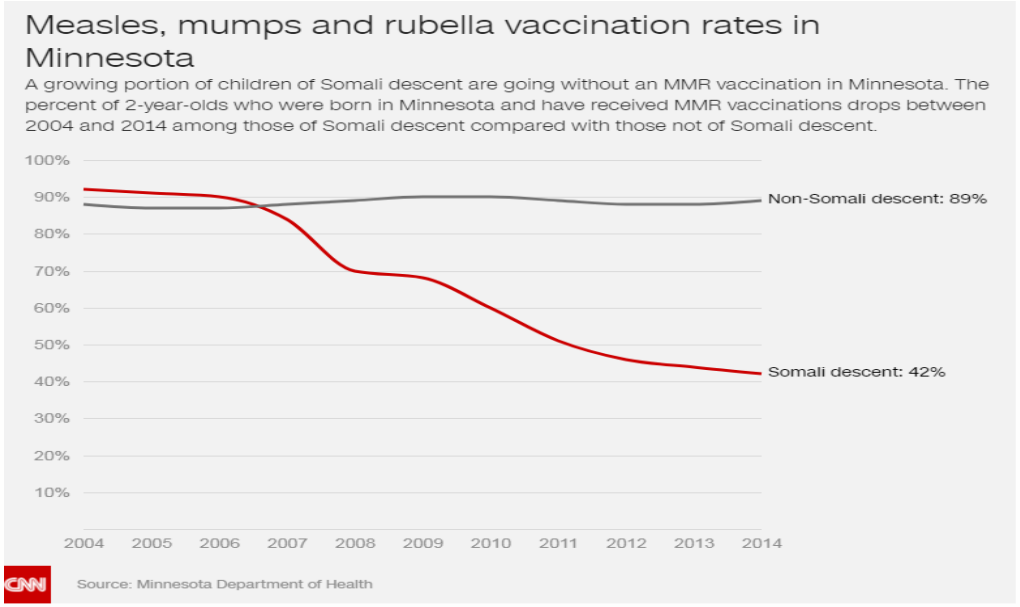
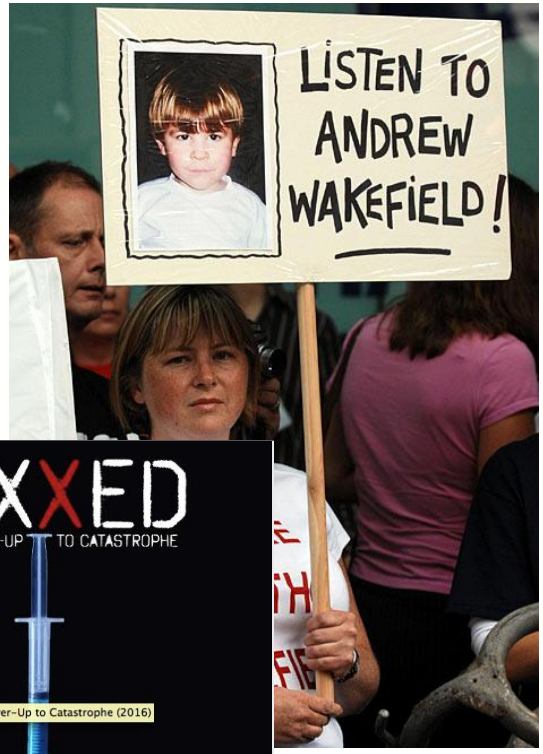
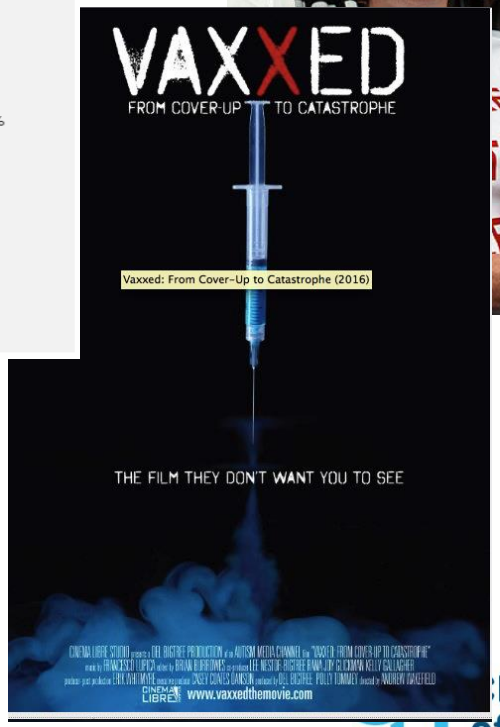
HAS EVIDENCE REMOVED CONCERN?







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IF I DON'T GET VACCINATED ARE THESE DISEASES REALLY THAT BAD? ISN'T NATURAL EXPOSURE BETTER?

- Choosing not to vaccine takes a risk
  - Some illnesses, risk is small, but not zero
  - Other illnesses, either common or highly contagious
    - Influenza, pneumococcus, meningococcus, chickenpox, measles, HPV
  - Serious sequelae: cancer, hospitalization, death

- Immune response following natural infection is generally stronger than immunization BUT natural infection has a high price
  - Certain vaccines produce a better response than natural infection

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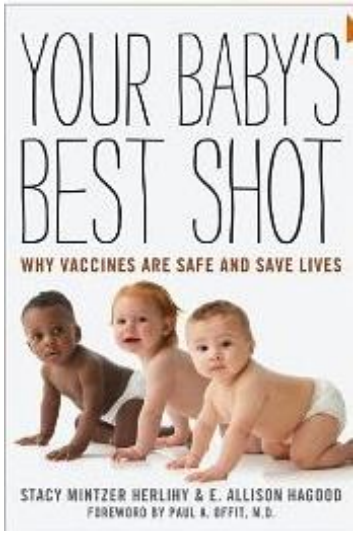
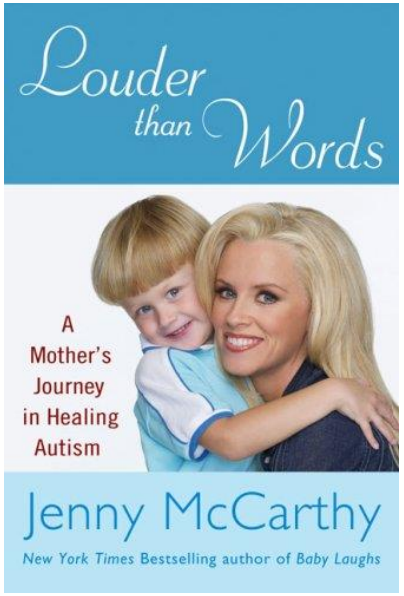
HOW DO I EFFECTIVELY COMMUNICATE ALL OF THIS INFORMATION??





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COMMUNICATION: IS PROVIDING INFORMATION EFFECTIVE?

- Different types of information about measles did not change beliefs about MMR and side effects or vaccines and autism
  - Parents who received a narrative about measles disease more likely to report belief that MMR causes significant side effects
  - Parents who saw images of a child with measles were more likely to report agreement with statement that vaccines cause autism

- Mothers who received discouraging vaccine information during pregnancy were less likely to vaccinate their infant on time compared to no information but encouraging information had no effect

Nyhan B, etal. Pediatrics 2014;

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COMMUNICATION: IT IS BOTH WHAT AND HOW

- Tailored messages: pilot study among 77 parents of young children, more parents who received messages tailored to their child or specific concerns reported positive MMR vaccine intentions compared to parents who received an untailored message
  - Name
  - Content
  - Experience
  - Image

‘Based upon your answers, it sounds like you may be worried about…’

‘You may have heard things in the news…’

‘It may seem scary to get Sue vaccinated’

Gowda, etal. Hum Vaccin Immunother. 2013; 9(2)
Hendrix, etal. PEDIATRICS, 2014; 134(3)

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TARGETED MESSAGING

Confidence	Convenience	Calculation	Complacency
Most difficult to convince	Remove barriers to access	Address concerns	Use a firm recommend-ation
Focus on trust	Reminder / Recall	Reliable information	Raise awareness about disease outbreaks

Betsch C, etal , Policy Insights from the Behav Brain Sci. 2015, 2(1).

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MOTIVATIONAL INTERVIEWING

OARS

O **O**pen Questions – what, why, how
"Tell me about…"

A **A**ffirmations – reflecting strengths
"The questions you are asking tell me you care about your child's health."

R **R**eflections – saying back what you think the parent meant
"I can tell you want to do what's best for your child, and you have concerns about vaccination. "

S **S**ummaries – a collection of what you heard
"I want to make sure I heard everything you've said to me…"

ASK, ACKNOWLEDGE, ADVISE

Part of communication toolkit but:

1. **May be difficult to teach**
2. **Studies have not shown association with decreased vaccine hesitancy**

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COMMUNICATION TRAINING: DOES IT WORK?

- Cluster randomized trial of a 5 component communication training:
  - Customized information sheets
  - HPV disease images
  - 2.5 hour communication training
  - Decision aid
  - Parent Education website

- Significantly higher odds of series initiation and completion in intervention sites (aOR 1.49, 95% CI 1.31 – 1.62 and aOR 1.56, 95% CI, 1.27-1.92)

- Fact sheets and communications most used and useful by parents and staff

Dempsey A, etal. JAMA Peds 2108; Lockhart, etal. Acad Pediatr 2018

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SHOULD PEDIATRICIANS DISMISS FAMILIES?

- "The decision to dismiss a family who continues to refuse immunization is not one that should be made lightly…Nevertheless, the individual pediatrician may consider dismissal of families who refuse vaccination as an acceptable option …"
  - American Academy of Pediatrics Countering Vaccine Hesitancy, 2016

…I cannot, in good conscience, endorse what I consider to be substandard care to my patients. I will accommodate their requests only because I feel that some vaccine is better than no vaccine…

We danced around a policy for way too long. We have had some pushback, but when confronted with dismissal, 75% of our 'vaccine skeptical' parents opt to stay in the practice.

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FAMILY DISMISSAL: INDIVIDUAL CHOICE VERSUS PUBLIC (OR CLINIC) GOOD

Protects those who cannot be vaccinated

Beneficence

Do no harm

Patient safety and standard of care

Strong message

Challenges autonomy

Undermines trust

Do no harm- may miss other health care

May not address root cause of hesitancy

Goes against obligation to care for ALL children

WHAT ABOUT THAT STORY I SAW ON YOU TUBE ABOUT THE TEENAGER WHO GOT THE FLU VACCINE? SHE'S WALKING BACKWARDS NOW.

VACCINE COMMUNICATION: WEB 2.0

- Internet is a primary source of health information for majority of people → ~42% of parents consult internet for vaccine information (CENSIS)

- Majority of U.S. users trust health info on internet but only sometimes or never evaluate information source

- You-tube immunization videos- 32% anti-vaccine AND more highly rated than pro-vaccine videos
  - Almost half disseminate inaccurate information

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GOOGLE SEARCH: 'VACCINE INFORMATION

Google

vaccine information

All | News | Images | Videos | Shopping | More | Settings | Tools

About 63,700,000 results (0.49 seconds)

Vaccine Information You Need from the Immunization Action Coalition
www.vaccineinformation.org/
This website is brought to you by the Immunization Action Coalition, a national leader in immunization education, For parents and people of all ages, it provides ...
Importance of Vaccines · Infants and Children · Influenza (flu) · Vaccine Basics

Vaccine Information Statement | Home | VIS | CDC
https://www.cdc.gov/vaccines/hcp/vis/index.html
Vaccine Information Statements (VISs) are information sheets produced by the CDC that explain both the benefits and risks of a vaccine to vaccine recipients. Federal law requires that healthcare staff provide a VIS to a patient, parent, or legal representative before each dose of certain vaccines.
Current VISs · Inactivated Influenza | VIS · Vaccine Information ... · Polio Vaccine

Vaccine Information Statement | Current VISs | CDC
https://www.cdc.gov/vaccines/hcp/vis/current-vis.html
Vaccine Information Statements (VISs) explain to vaccine recipients both the benefits and risks of a vaccine.

Vaccine Information Statements - VISs - CDC information sheets for ...
www.immunize.org/vis/
Vaccine Information Statements (VISs) are CDC information sheets for patients and parents about vaccines. IAC provides VISs in more than 40 languages.

National Vaccine Information Center - Your Health. Your Family. Your ...
https://www.nvic.org/
National Vaccine Information Center is a charitable non-profit organization dedicated to preventing vaccine injuries and deaths through public education and to ...
National Vaccine Information ... · Vaccine Law Information - NVIC · About Us · Faqs

Vaccine Information Statements - AAP.org
https://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/.../vis.aspx
Vaccine Information Statements. Vaccine Information Statements (VISs) are produced by the Centers for Disease Control and Prevention (CDC) as 1-page information sheets. They are designed to inform vaccine recipients and their parents or guardians about the benefits and risks of vaccines.

VIC Fellowship (Vaccine Information Coalition) - Home
www.vacinfo.org/
American Academy of Family Physicians (AAFP) endorsed annual childhood vaccine schedule, your

National Vaccine Information Center
Nonprofit organization

nvic.org

The National Vaccine Information Center is an American anti-vaccine organization which has been widely criticized as a leading source of vaccine misinformation and fearmongering. Wikipedia

Founded: 1982
Type of business: 501(c)3
Founders: Barbara Loe Fisher, Kathi Williams, Jeff Schwartz

Profiles
Facebook

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American Academy of Pediatr... | Generation Rescue | Every Child By Two | Gavi, The Vaccine Alliance | Association of American...

Claim this knowledge panel *Feedback*

See results about
Vaccine
A vaccine is a biological preparation that provides active acquired

PUBLIC POLICY TO INFLUENCE SOCIAL NORMS: LEVERAGE WEB 2.0

- Social marketing principles: Product, Price, Place, Promotion to change how vaccines are valued
- Leverage social media to deliver information and interact

Rosselli R, etal. J Prev Med Hyg 2016; 57: E37-E50

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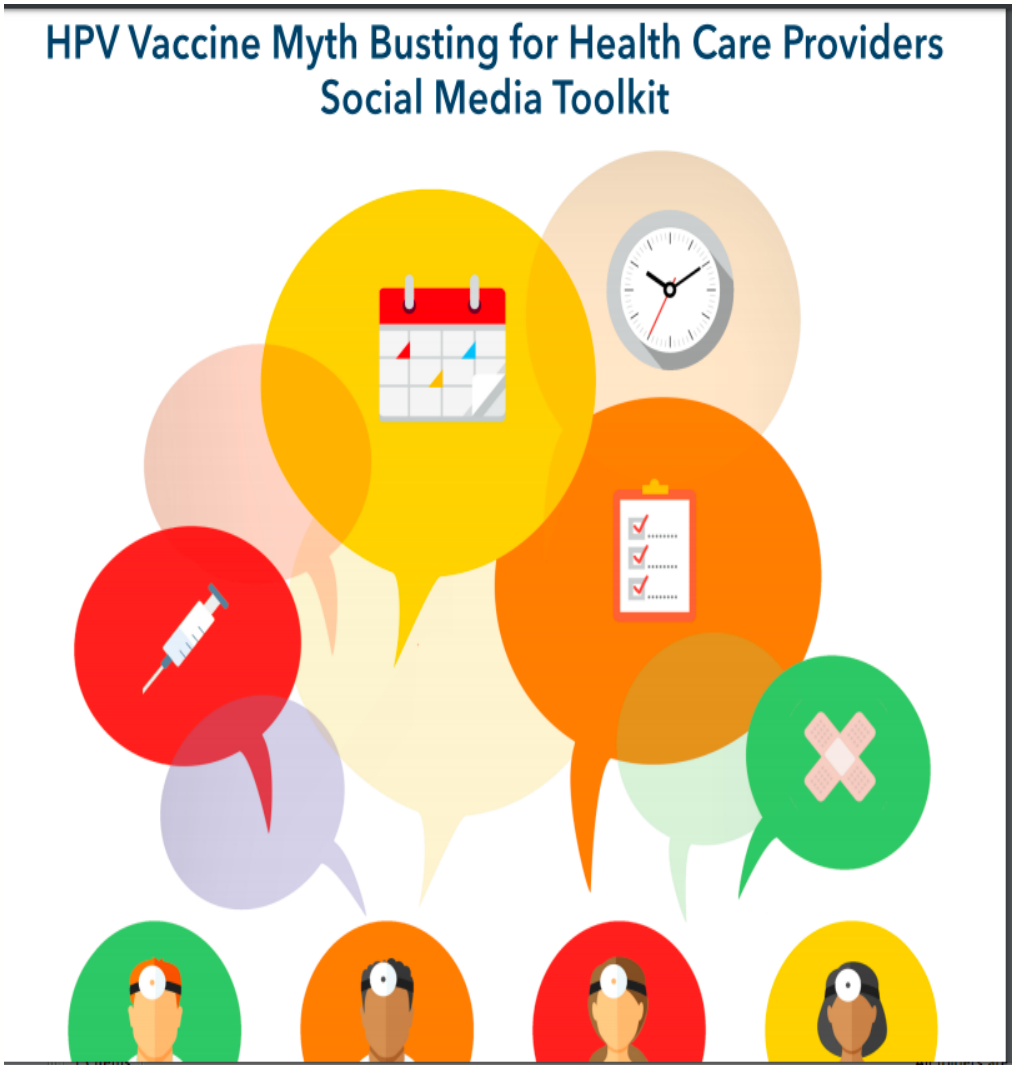
SOCIAL MEDIA AND HPV COMMUNICATION



- 74% adults use social networking sites
- One-third adults use social media for health information
- Majority of adults trust health info found on-line but do not evaluate source

Source: 2014 Pew Research Center survey

https://smhs.gwu.edu/cancercontroltap/sites/cancercontroltap/files/HPV%20Vaccine%20Social%20Media%20Toolkit%20FINAL.pdf

PUBLIC HEALTH POLICY AND VACCINE ACCEPTANCE

HERD IMMUNITY AS A PUBLIC GOOD

- Vaccine refusal is an individual choice that affects others

"Liberty consists of the freedom to do everything which injures no one else."

-Declaration of the Rights of Man and of the Citizen

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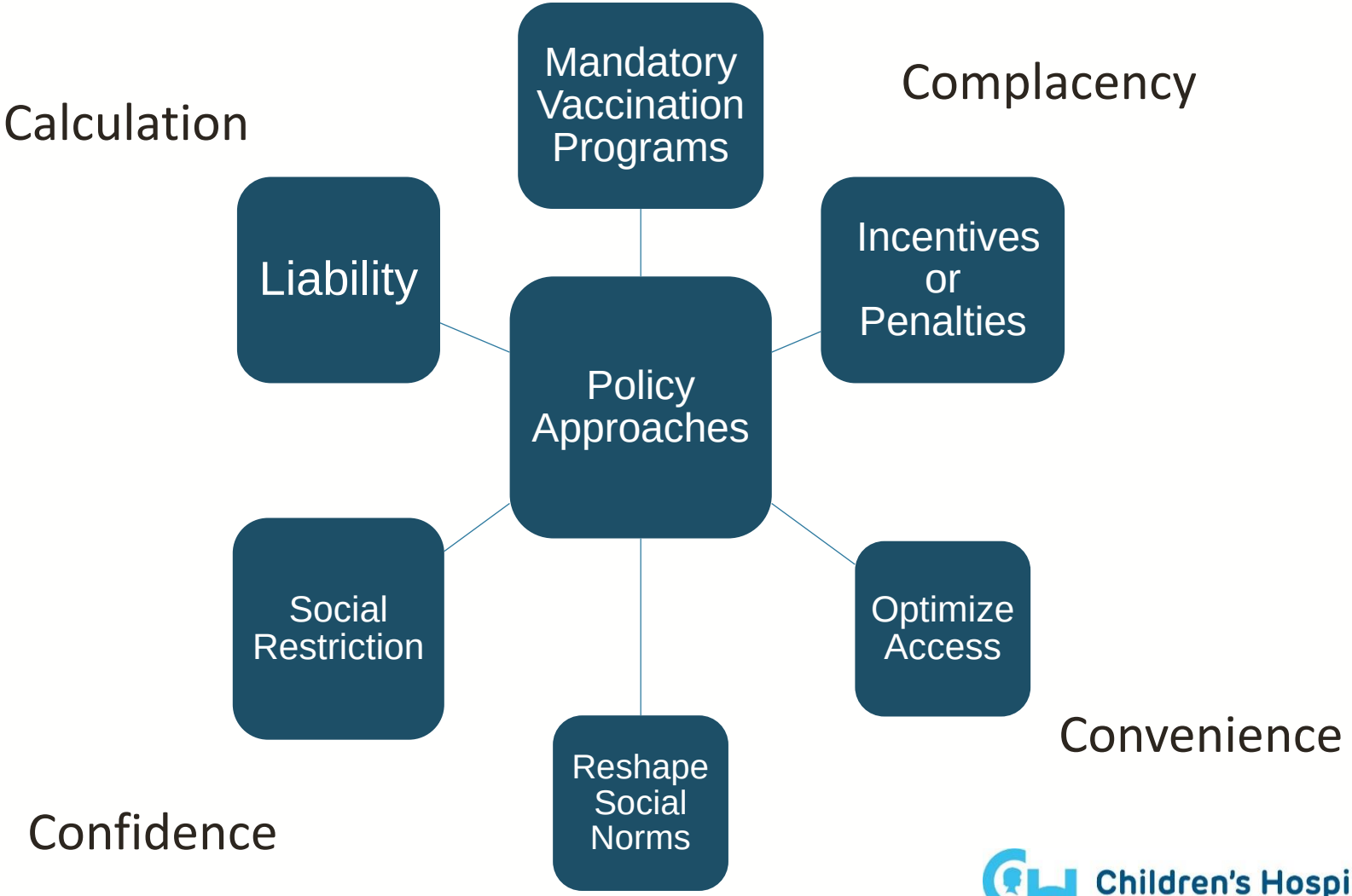
HOW CAN POLICY INFLUENCE VACCINE DECISION-MAKING



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MANDATORY VACCINATION AS STATE POLICY

- All 50 states in U.S. have school entry requirements for childhood vaccines but states may allow exemptions
- 47 states allow religious exemptions
  - In 2013, CDC identifies ~30,000 children whose parent chose not to vaccinate for religious reasons

- 17 states allow personal belief / philosophical exemptions
  - Ease of obtaining an exemption significantly differs

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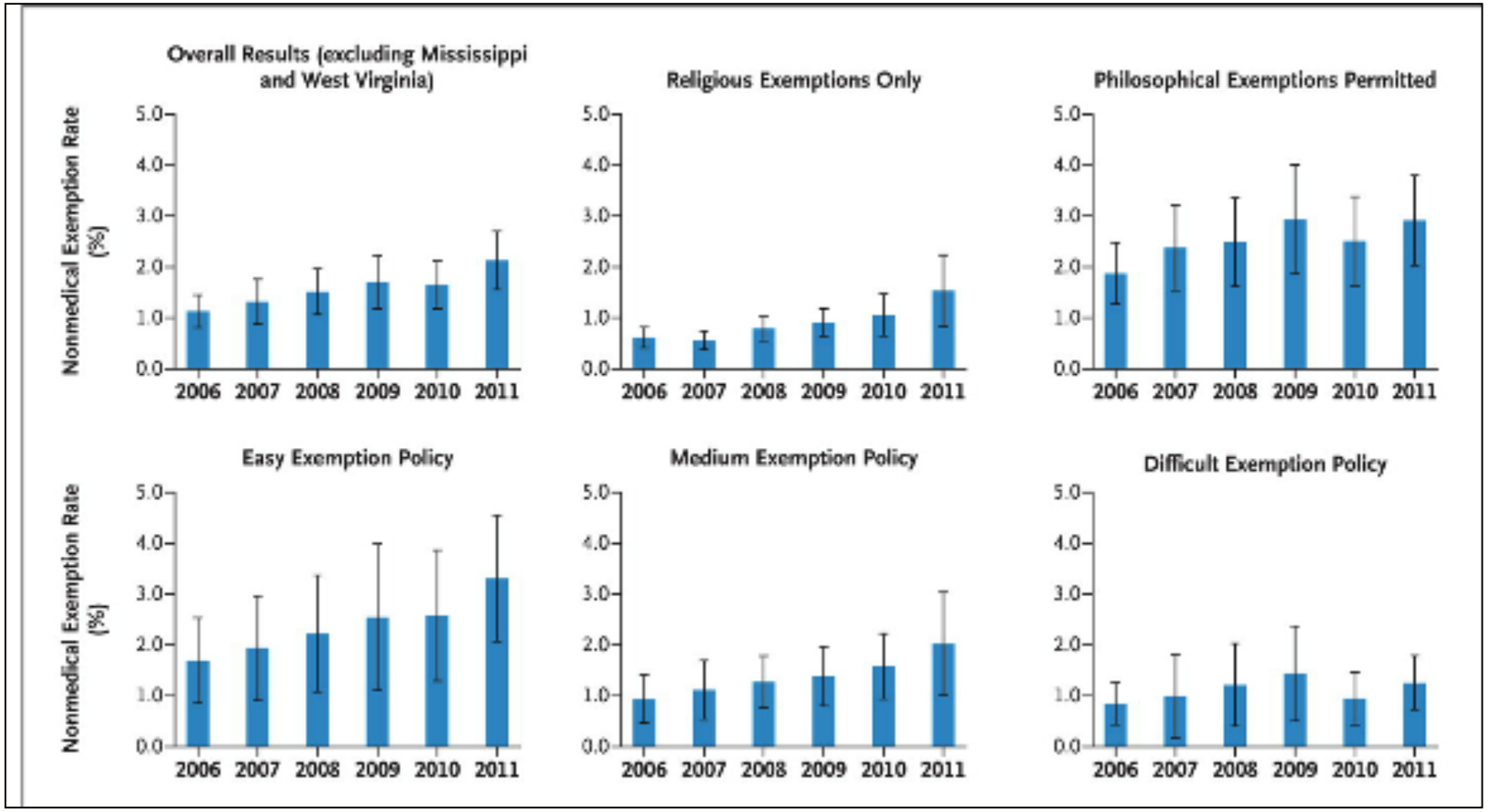
EASE OF REFUSAL CAN INFLUENCE LIKELIHOOD OF REFUSAL



Omer SB, etal. NEJM 2012; 367; Omer SB JAMAPediatrics 2014;311(6).

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HOW CAN POLICY INFLUENCE VACCINE DECISION-MAKING

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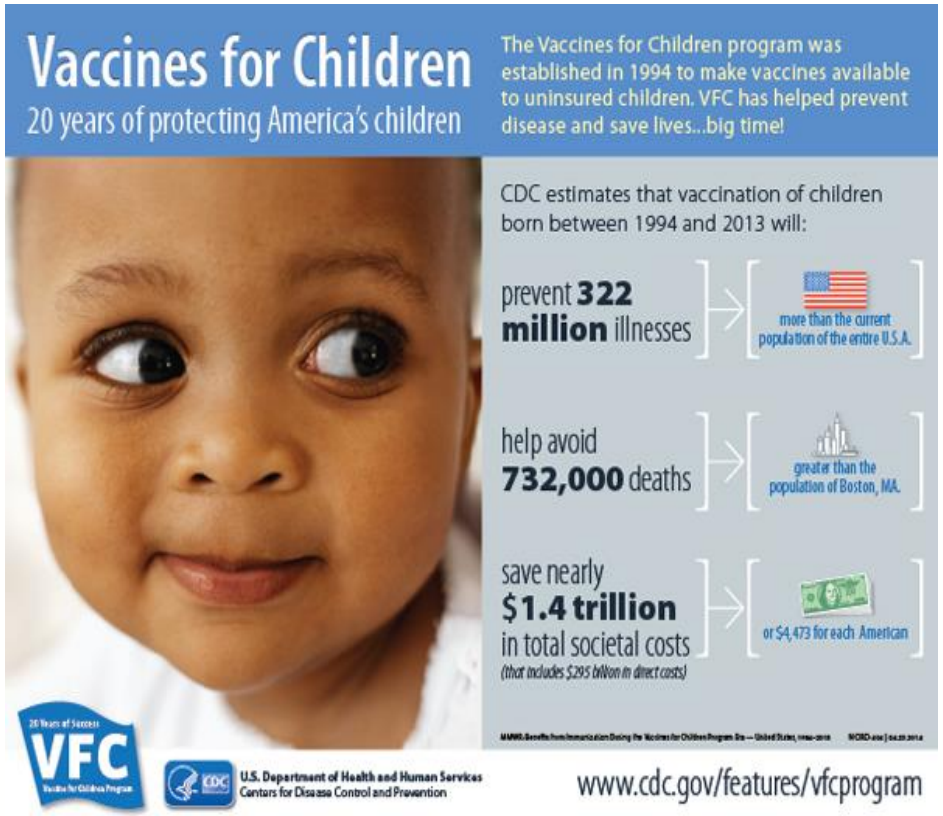
REMOVING SYSTEM AND COST BARRIERS TO IMPROVE ACCESS

2014/2015 School-Based Immunization Schedule

Activity	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
Grade 7 Hepatitis B	Dose 1	Dose 1					Dose 2	Dose 2	Dose 2
Grade 7 Menactra				Dose 1	Dose 1				
Grade 8 HPV	Dose 1	Dose 1		Dose 2	Dose 2		Dose 3	Dose 3	Dose 3



- http://www.hkpr.on.ca/portals/0/Images%20-%20Youth/immunization_sked.jpg

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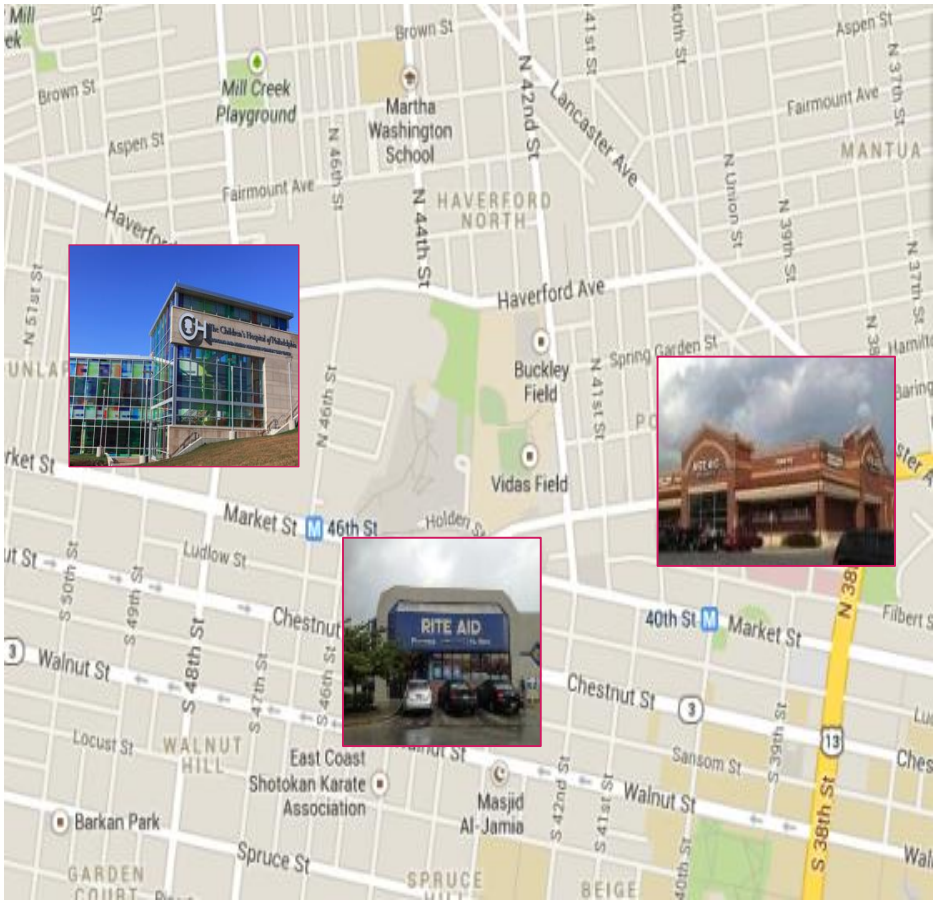
PHARMACY VOUCHERS AND TDAP VACCINATION OF INFANT CAREGIVERS



PHARMACY VOUCHERS AND TDAP VACCINATION

	Study arm				
Voucher amount: *Video:* Outcome	$5 No (n = 24)	$5 Yes (n = 24)	Full cost No (n = 23)	Full cost Yes (n = 24)	P
Redeemed Tdap vaccine voucher, n (%)	**0 (0%)**	**0 (0%)**	**0 (0%)**	**1 (4%)**	**.999†**
Redeemed gift card, n (%)	9 (38%)	10 (42%)	8 (35%)	9 (38%)	.970‡

% responding "Agree" or "Strongly Agree" ***Voucher amount:***	**$5** **(n = 15)**	**Full cost** **(n = 17)**
Pediatrician's office was good place to receive the vaccine voucher	87%	82%
[Participating] pharmacies were convenient locations for me to use the voucher	67%	88%
The voucher persuaded me to get the vaccine	67%	65%

Buttenheim A, etal. Vaccine. 2015

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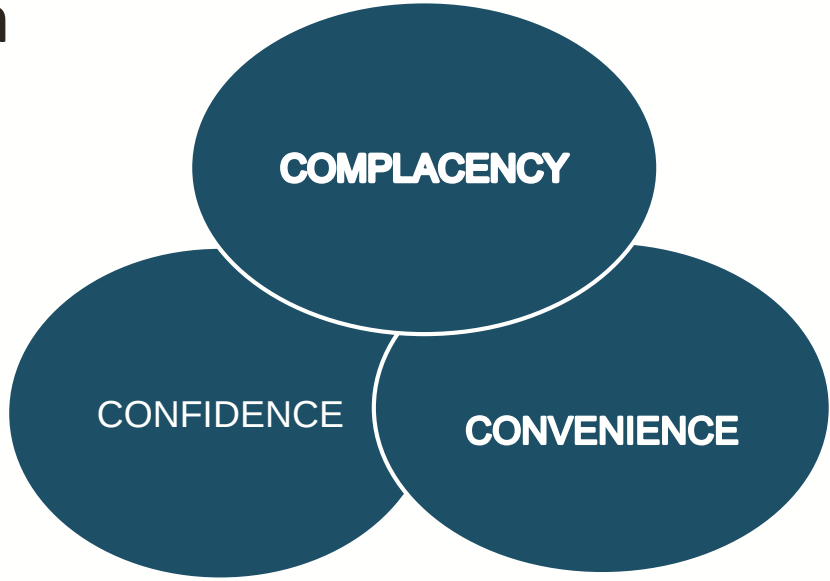
VACCINES ARE A PUBLIC HEALTH SUCCESS BUT…

- Ongoing vigilance is important
- Vaccine policy will continue to evolve with changing epidemiology
- Vaccine hesitancy is a complex challenge that will require a multifaceted approach

A strong, consistent message is crucial



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LEVERAGE RESOURCES

Need help responding to vaccine-hesitant parents?

Science-based materials are available from these respected organizations

American Academy of Pediatrics (AAP)

Healthcare providers can find numerous resources on the AAP's website to help with parents and caregivers who have questions about vaccinating their child at www2.aap.org/immunization/families/deciding.html. When parents cannot be convinced, consider using AAP's Refusal to Vaccinate form at www2.aap.org/immunization/pediatricians/pdf/RefusaltoVaccinate.pdf.

California Immunization Coalition

The California Immunization Coalition (CIC) has developed several excellent provider pieces that discuss common questions many parents may have regarding vaccines for their children. These include

- "Responding to Parents' Top 10 Concerns" www.cdph.ca.gov/programs/immunize/Documents/IMM-917.pdf
- "Talking with Parents About Vaccine Safety" www.cdph.ca.gov/programs/immunize/Documents/IMM-915.pdf
- "Alternate Vaccine Schedules: Helping Parents Separate Fact From Fear" http://eziz.org/assets/docs/IMM-988.pdf

Centers for Disease Control and Prevention (CDC)

from the popular book "Baby 411" by Dr. Ari Brown. www.immunize.org/catg.d/p2068.pdf

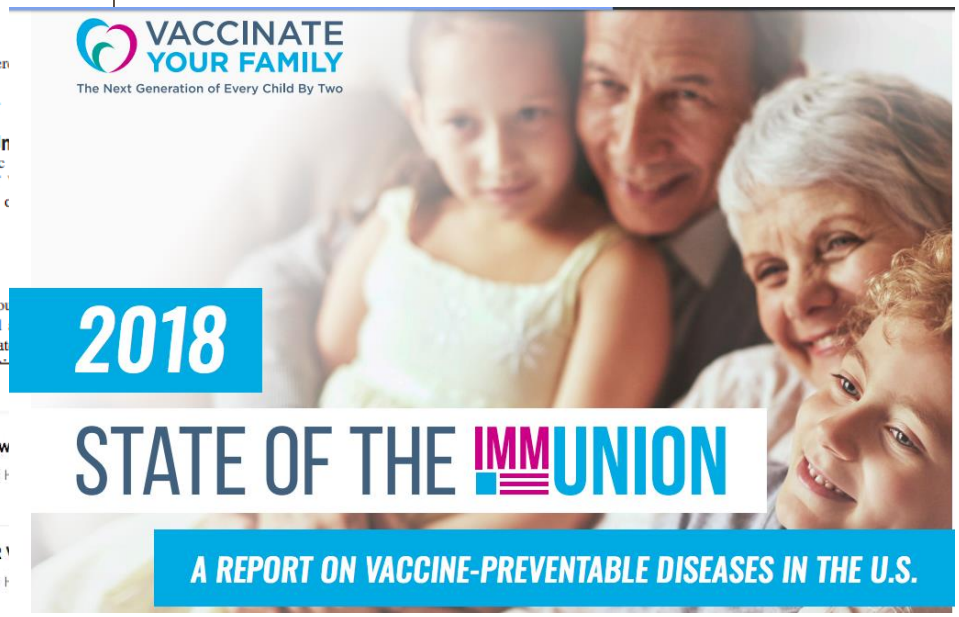
- "Decision to Not Vaccinate My Child" www.immunize.org/catg.d/p4059.pdf
- "Reliable Sources of Immunization Information: When find answers!" www.immunize.org/catg.d/p4012.pdf
- "Vaccines Work!" www.immunize.org/catg.d/p4037.pdf

Institute for Vaccine Safety, Johns Hopkins Un

The Institute for Vaccine Safety collects vaccine-specific formation. Of particular interest is its "Components of section, which contains tables specifying the contents c vaccines: www.vaccinesafety.edu/components.htm.

Vaccine Education Center (VEC) Children's Hospital of Philadelphia

VEC offers handouts in English and Spanish as well as fou booklets covering immunization of infants, teens, and well as one about vaccine safety. These educational mat



Talking About Vaccines with Dr. Paul Offit: Age Groups and Vaccines

14 videos • 12,279 views • Last updated on Jan 22, 2018

Dr. Paul Offit of the Vaccine Education Center at The Children's Hospital of Philadelphia answers many common questions about vaccines for every age group in this video series.

The Children's Hospital of Philadelphia

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3 Do Babies Get Too Many Vaccines? — The Children's Hospital of Philadelphia (2:19)

4 Are Combination Vaccines Safe? — The Children's Hospital of Philadelphia (1:51)

5 What Vaccines Might My Child Need Before Starting School? — The Children's Hospital of Philadelphia (1:31)

6 Why Are Vaccines Required Before My Child Goes to School? — The Children's Hospital of Philadelphia (2:22)

LEVERAGE RESOURCES

- Offit PA, Moser, CA. *Vaccines and Your Child: What Every Parent Should Know.* New York, NY: Columbia University Press; 2011
- Feemster KA. Vaccines: What Everyone Should Know. New York, NY: Oxford University Press; 2017
- Vaccine Education Center at The Children's Hospital of Philadelphia (http://www.chop.edu/service/vaccine-education-center/home.html)
- www.vaccineconfidence.org
- Center for Vaccine Ethics and Policy (http://centerforvaccineethicsandpolicy.wordpress.com/)
- Vaccine Safety Datalink Project (www.cdc.gov/od/science/iso/vsd)
- Centers for Disease Control and Prevention: http://www.cdc.gov/vaccines/vpd-vac/hpv/default.htm#clinical
- Immunization Action Coalition: http://www.immunize.org
- Every Child By Two: http://www.ecbt.org
- World Health Organization (WHO): http://www.who.int/vaccine_safety/en/)

THANK YOU!

“We’re Immunized!” Parents of Kids with Infectious Diseases “I’m Immunized” Campaign

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