

Vaccine Exemptions: Should we be concerned?

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Vaccination history

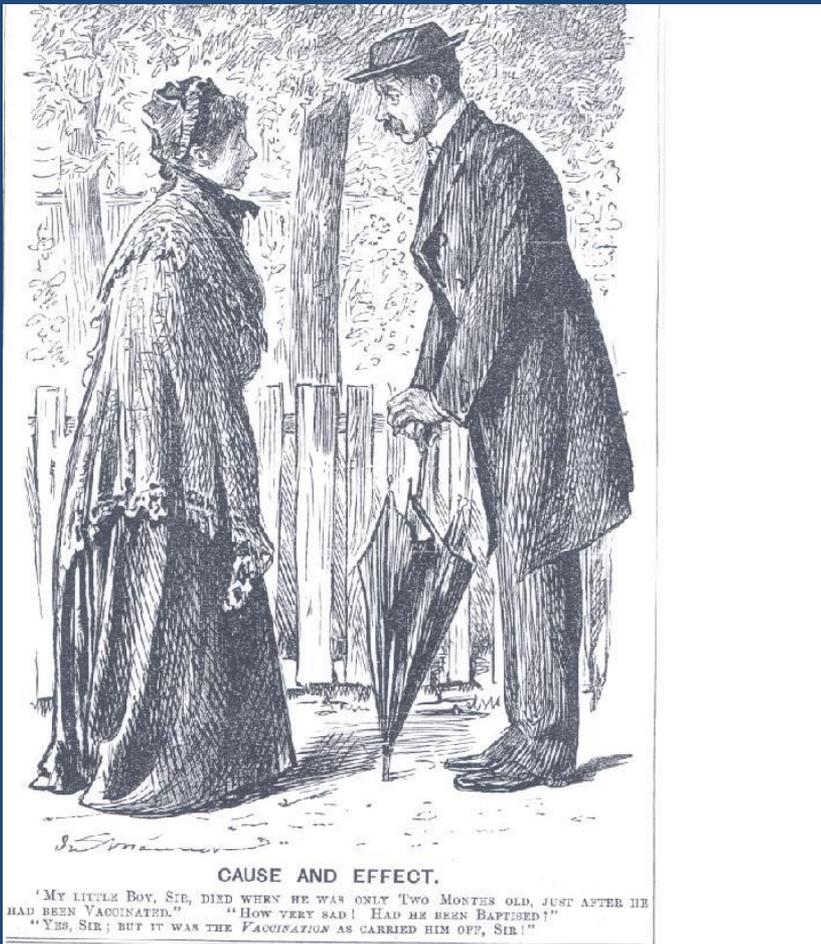
- Variolation was the first variety of immunization; used against smallpox
- Widespread use began in early 1700s
- Scrapings taken from infected person
- Recipient had an incision made and the material was essentially rubbed into the wound
- An anti-vaccination movement was also born

Benjamin Franklin

“In 1736 I lost one of my sons, a fine boy of four years old, by the small-pox, taken in the common way. I long regretted bitterly, and still regret that I had not given it to him by inoculation. This I mention for the sake of parents who omit that operation, on the supposition that they should never forgive themselves if a child died under it; my example showing that the regret may be the same either way, and that, therefore, the safer should be chosen.”

September 19th, 1891

Punch Magazine



- “My little boy, sir, died when he was only two months old, just after he had been vaccinated”.
- “How very sad! Had he been baptized?”.
- “Yes sir, but it was the *vaccination* as carried him off, sir!”.

Parallels to today

- The assignment of causality to a temporal relationship
 - We like to find patterns
- As humans, we may be more likely to be guided by emotion than by cold, hard facts

Anti-vaccination strategy from 1800's

The Medical Times and Gazette (J. & A. Churchill; London, England, Volume 1, 1876, page 41)

- Leafleting

- The birth of a child was announced in the newspaper, and the father shortly thereafter received some mail (post-card persecution)

- “Anti-vaccinators had “been discouraged by the result of their legitimate endeavors to oppose the (mandatory vaccination) law, and are now having recourse to circulars, **which depend for their influence on vague threats and unwholesome insinuations**“.

Anti-vaccination strategy of today

- Same thing, only this:



THURSDAY, FEBRUARY 5, 2005

THE LANCET

The Lancet, Volume 351, Issue 9103, Pages 637 - 641.
doi:10.1016/S0140-6736(97)11096-0

This article was retracted

RETRACTED

RETRACTED: Ileal-lympho pervasive developmental

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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.

DISCUSSION OF LINKS



What are vaccine exemptions?

- Parents opt out of vaccinations for enrollment into school or daycare
- All 50 states provide for at least one type of exemption (special cases: WV, MS)
- Three main categories
 - Medical
 - Religious
 - Personal beliefs

How do you get an exemption?

- Protocols are set by the state
- Ease of obtaining exemptions varies widely
 - Ranges from parental signature on a pre-printed form to going to the health department in person, signing and notarizing form, and obtaining approval from the health department.

Exemption protocols and immunization rates

Ernst and Jacobs, Human Vaccines and Immunotherapy, 2012

	Vaccine coverage (% \pm sd)				
Obtaining PBE	MMR	DTP/DTAP/DT	Poliovirus	Hepatitis B	Varicella (1 dose) ²
Easy (n=7)	92.7 \pm 3.2	92.3 \pm 3.3	93.7 \pm 2.1	95.1 \pm 2.6	97.9 \pm 1.6
Medium (n=7)	93.6 \pm 4.2	94.8 \pm 3.9	95.7 \pm 3.6	95.9 \pm 3.2	94.8 \pm 3.2
Difficult (n=4)	97.2 \pm 4.1	97.1 \pm 2.0	97.5 \pm 1.9	98.2 \pm 1.2	98.8 \pm 0.7
p-trend ³	0.06	0.03	0.05	0.09	0.76

Impact of Exemptions

Feiken et al, 2000. JAMA 284:3145-3150

Age group	Measles Annual incidence/100,000		Pertussis Annual incidence/100,000	
	Exemptors	Vaccinated	Exemptors	Vaccinated
3-5	39.8	0.6	90.8	11.0
6-10	54.0	0.9	141.8	9.4
11-14	27.9	1.7	35.0	18.6
15-18	5.6	2.5	0.0	13.5
Total	32.2	1.4	80.0	13.0

On average, exemptors were 22 times more likely to contract measles and 5.9 times more likely to contract pertussis than vaccinated children

Current Arizona Exemption Protocol

- One of the easiest U.S. protocols
- Form completed by parent at time of enrollment of child in K, 5th and 9th grade
 - Available online or at school
 - Signature of parent only
 - Can exempt all or select vaccines

Arizona and Vaccine Exemption

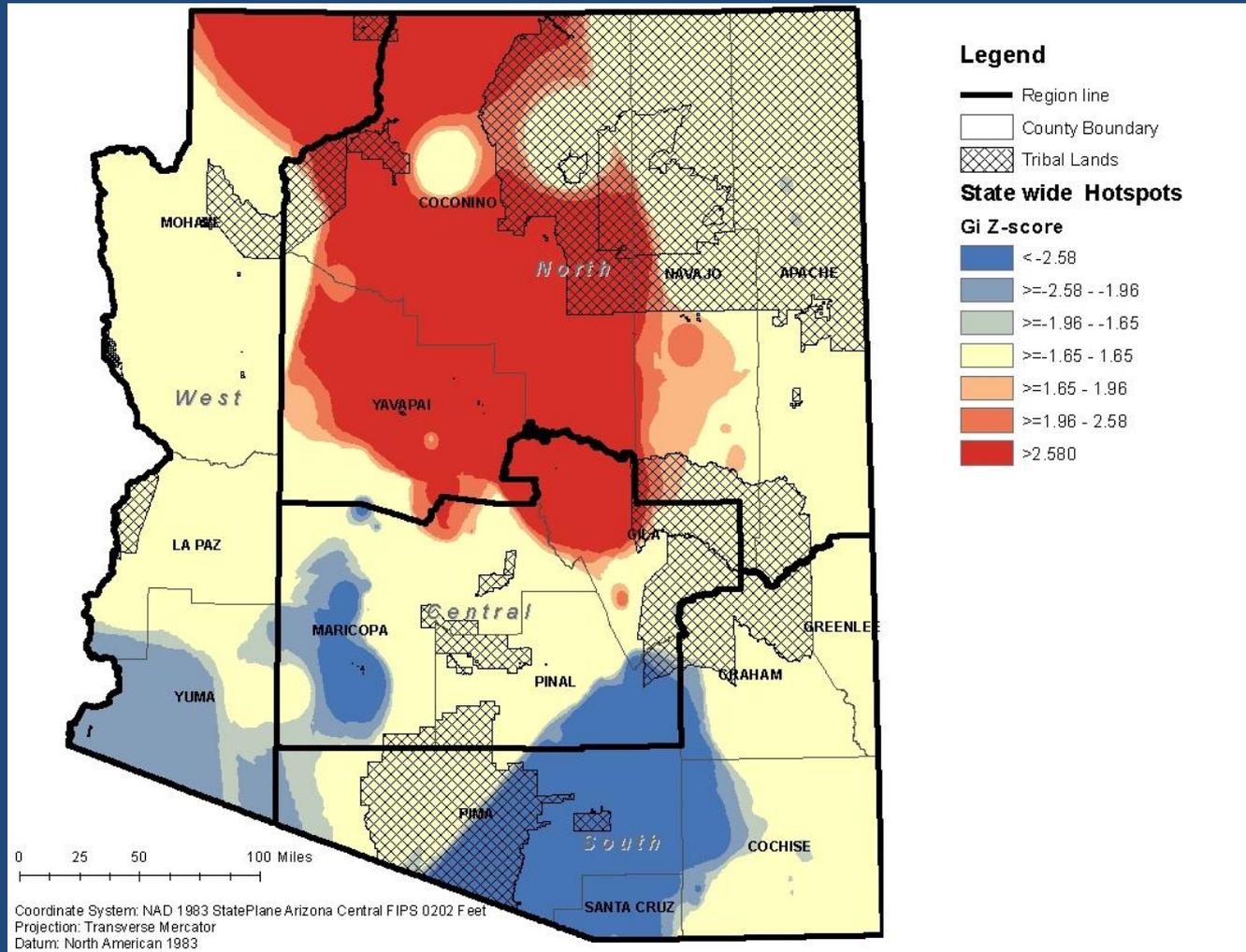
- Non-Medical exemption on the rise
 - In the 2011 year Arizona experienced a 14% increase in non-medical exemption over 2010
 - Since 2005-2006: 78% increase
 - Since 2000-2001: 129% increase

Research Goals

- Determine characteristics of schools with high exemption rates
- Identify factors associated with exempting parents
- Assess physician attitude towards exemptions in Arizona

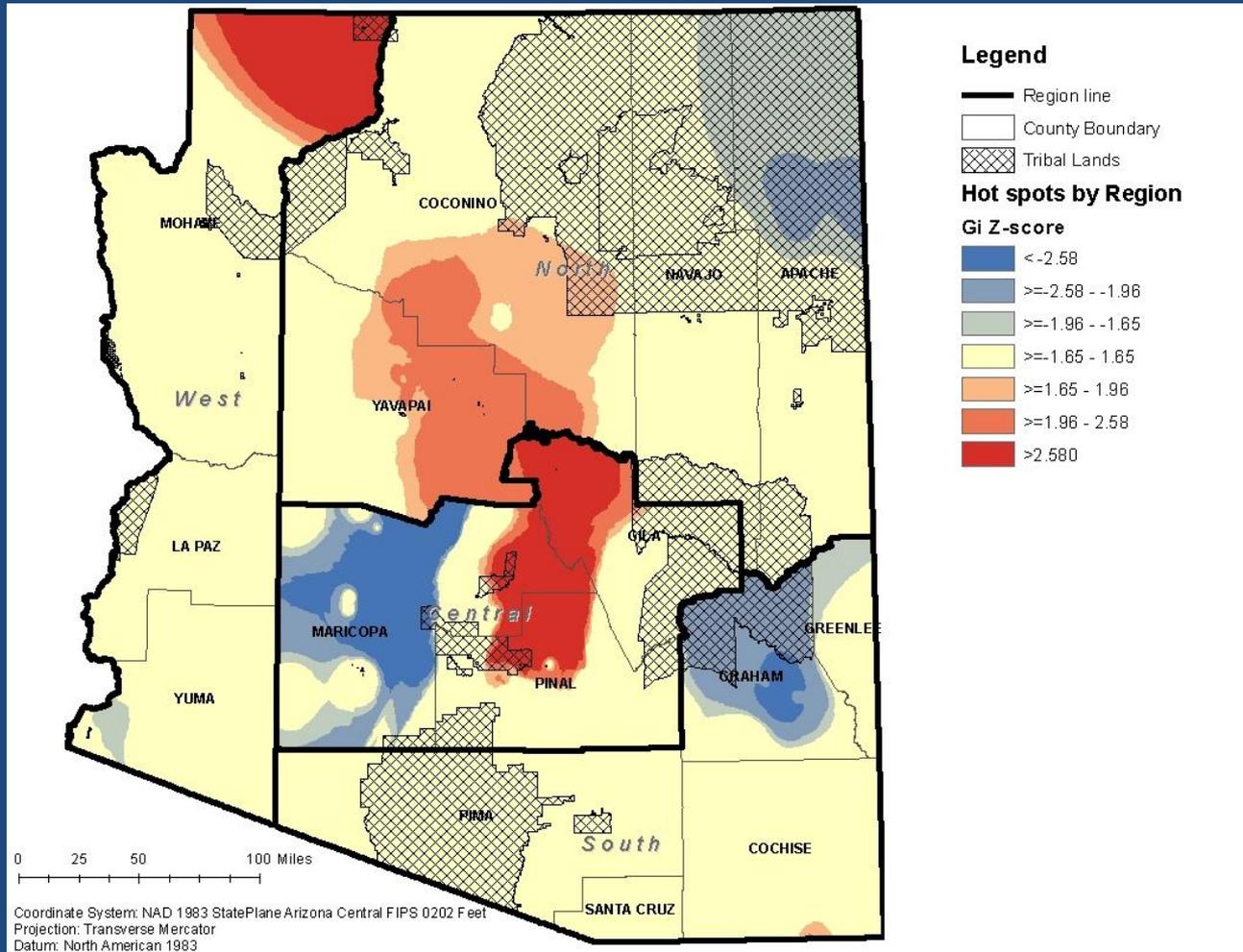
Statewide Hotspots of High and Low Vaccine Exemptions

Birnbaum et al., Vaccine, December 2012



Regional Hotspots of High and Low Vaccine Exemptions

Birnbaum et al., Vaccine, December 2012



Key Findings

Birnbaum et al., Vaccine, December 2012

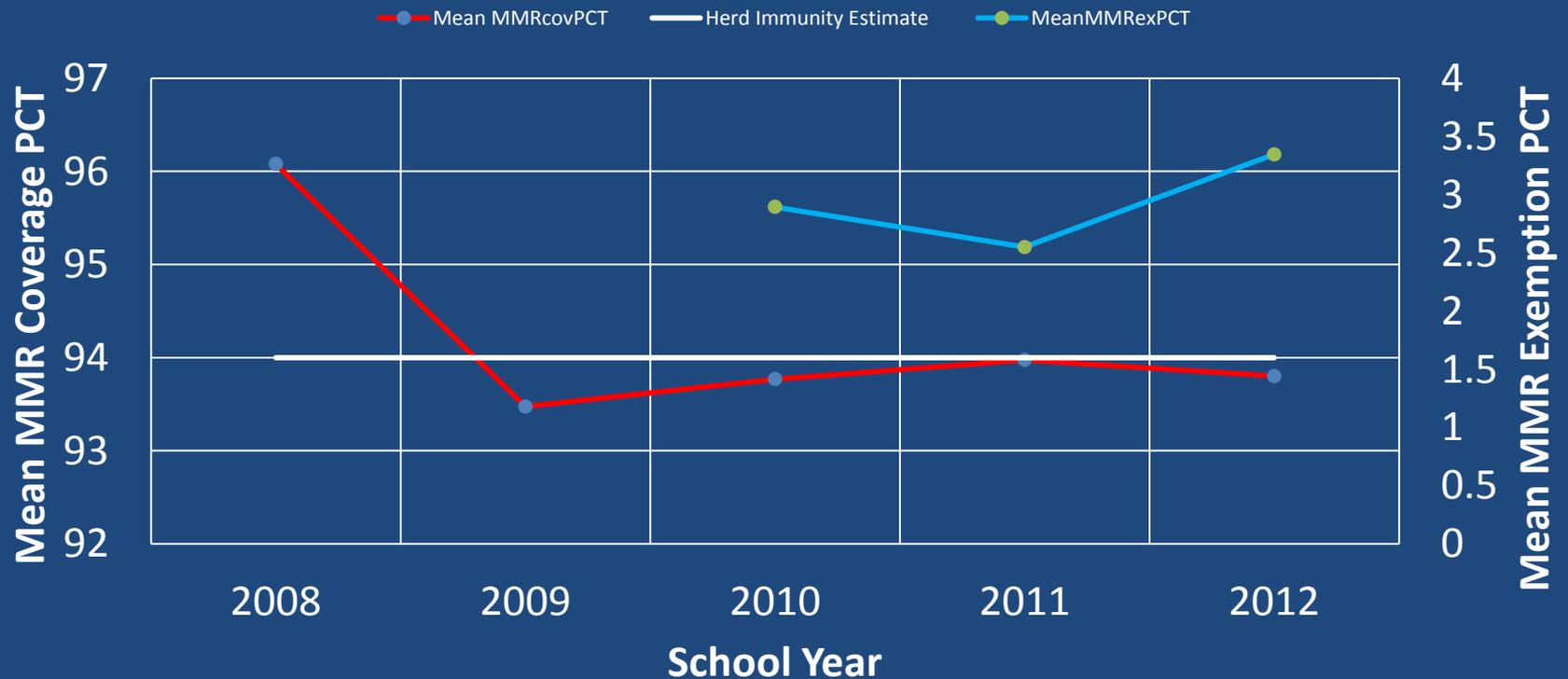
Higher exemption rates found in:

- Schools with fewer minorities
- Charter schools
- Lower proportion of free/reduced lunch
- Sedona, Colorado City, East Maricopa

Pima County Vaccine Exemptions

(Garcia, Silvano; Garcia, Francisco)

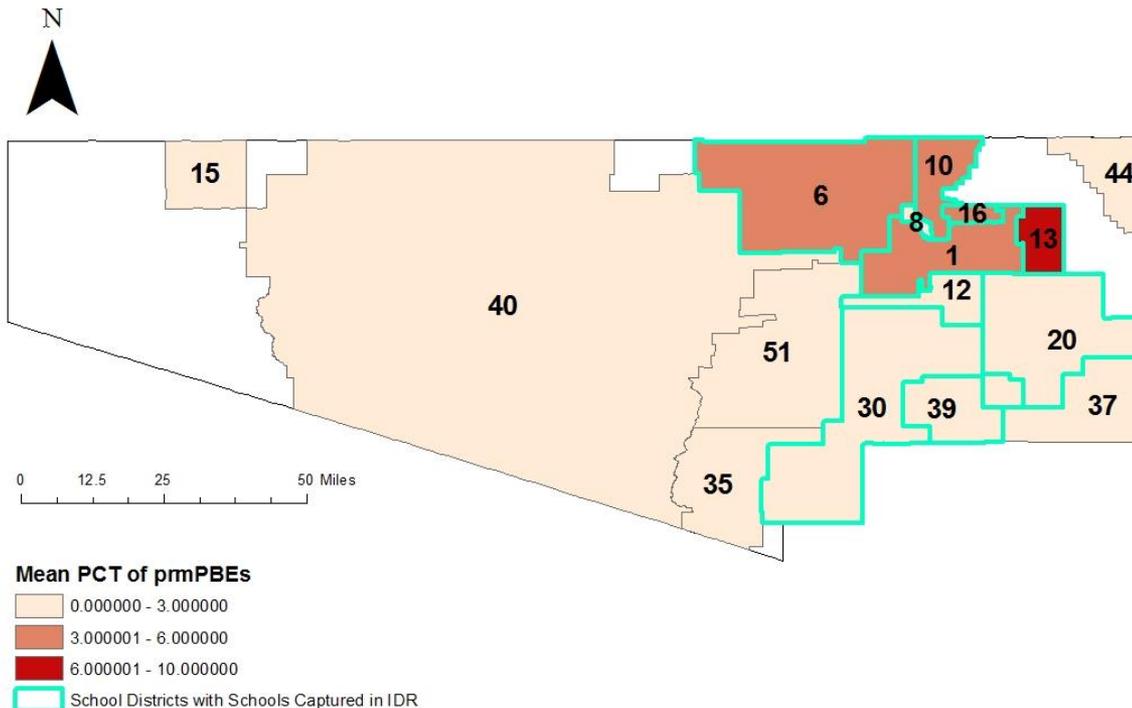
Mean MMR Coverage and Exemption Percentages in Kindergarten Schools, 2008-2012 Pima County



Vaccine exemptions Pima County

(Garcia, Silvano; Garcia, Francisco)

2012 Mean PCT of Permanent PBEs in Kindergarten Schools by School District in Pima County



16 School Districts

- 1 TUSD
- 6 Marana
- 8 Flowing Wells
- 10 Amphitheater
- 12 Sunnyside
- 13 Tanque Verde
- 15 Ajo
- 16 Catalina
- 20 Vail
- 30 Sahuarita
- 35 San Fernando
- 37 Empire
- 39 Continental
- 40 Indian Oasis
- 44 Redington
- 51 Altar Valley

Physician survey

Haenchen et al., Vaccine, 2014

- 152 physicians participated (Response rate = 13.5%)
- Represented all counties in Arizona except Apache

Action After Exemption is taken

Haenchen et al., Vaccine, 2014

After requesting a vaccination exemption, do you provide care differently to the children?

Answer Options	Yes	% indicating change
Refuse to provide regular care	10	8.9%
Monitor child's health differently	43	38.7%
No change in care provided	56	51.9%

Attitude about signing exemption waiver

Haenchen et al., Vaccine, 2014

Some states have protocols in which clinicians approve and sign off on philosophical/personal belief exemptions for childhood vaccines required for entrance into public school. Do you feel as though such a protocol should be implemented?

Yes	36.6%	41
No	63.4%	71

Would you educate parents about childhood vaccines before signing a personal/philosophical belief exemption form?

Yes	95.7%	110
No	4.3%	5

Do you feel as though such a practice would reduce philosophical belief exemptions?

Yes	49.1%	55
No	50.9%	57

Do you feel this protocol would be a burden to your practice?

Yes	55.3%	63
No	44.7%	51

Qualitative Responses – Vaccine exemption

- Lenient: “I strongly believe in vaccinating my patients; however, ultimately the decision is up to the parents.....”
- Hard-line: “I will not accept unvaccinated children in my practice”.

Qualitative: physician sign-off

- *“Asking me to approve a parents’ philosophical/personal belief would be asking me to violate my own philosophical/personal beliefs and makes it appear that medical providers approve of these decisions. If a parent wants to make these decisions, they have to also assume the consequences of these decisions.”*

Washington's vaccine exemption law
resulted in a drop of 1.5% in vaccine
exemptions since 2011

School Nurses and Vaccine Exemptions

Salmon et al. Pediatrics, 2004

- Survey sent to 1000 schools, randomly selected, in Colorado, Massachusetts, Missouri, and Washington
- Personnel reported training, perceptions and beliefs re. disease severity, immunization safety, etc. .
- Examined the factors associated with the likelihood of a child having an exemption

School Nurses and Vaccine Exemptions

Salmon et al. Pediatrics, 2004

- If a school nurse responded to the survey, a child was significantly less likely to have had an exemption
- Nurses were more likely than non-nurses to understand the safety and efficacy of vaccinations
- If a respondent or family had used alternative medical treatments, a child was more likely to have an exemption

School Nurses and Vaccine Exemptions

Salmon et al. Pediatrics, 2004

- Training, knowledge, and attitudes of school personnel are critical to maintaining vaccination rates
- Many non-nurse school personnel were unaware of severity of VPDs

Discussion

- Vaccination exemptions continue to rise
- School nurses are, without question, one of the most important links to vaccination
- Our culture is changing and we need to address ways to be responsive
- This includes being able to clearly state the benefits of vaccination

Questions?

- ADHS
 - Will Humble
 - Patty Gast
 - Karen Lewis
 - Jennifer Ralston-King
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