

Discussing vaccination strategies with hesitant parents

Nov 2022

J Pernica



Faculty disclosure – J Pernica

- Relationships with financial sponsors:
 - Grants paid to academic institution:
 - MedImmune, bioMérieux
 - Speakers bureau:
 - none (besides Canadian Paediatric Review)
 - Consulting fees: none
 - Patents: none
 - Other: none

**Vaccine
hesitancy in
the pre-
COVID19
period**

Scientists Thought They Had Measles Cornered. They Were Wrong.



By Donald G. McNeil Jr.

April 3, 2019



[Leer en español](#)

The measles outbreak that [led to a state of emergency in New York's Rockland County](#) began far away: in an annual Hasidic pilgrimage from Israel to Ukraine.

How many children in Ontario were not 'up-to-date' with vaccines?

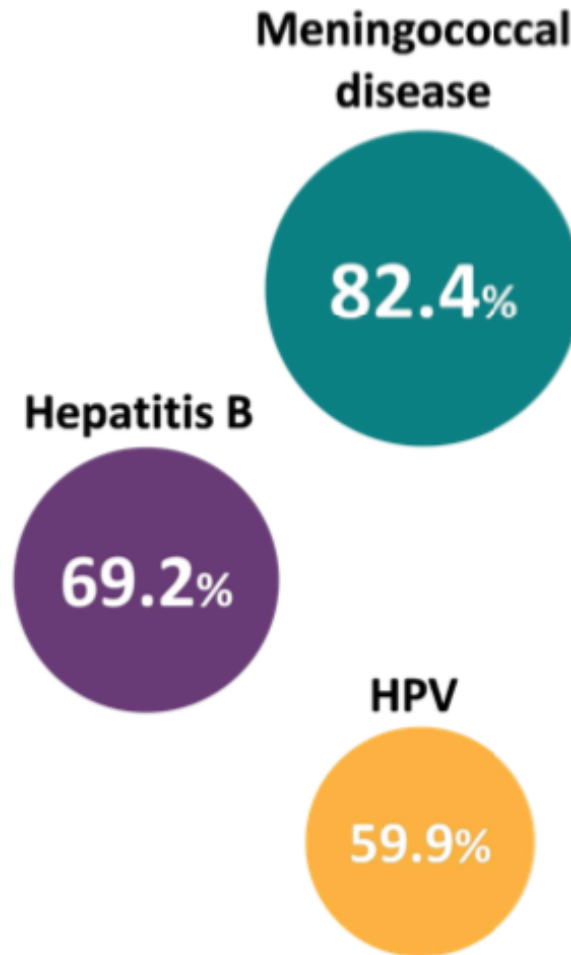
Public
Health
Ontario

Santé
publique
Ontario

Immunization Coverage Report for School Pupils in Ontario

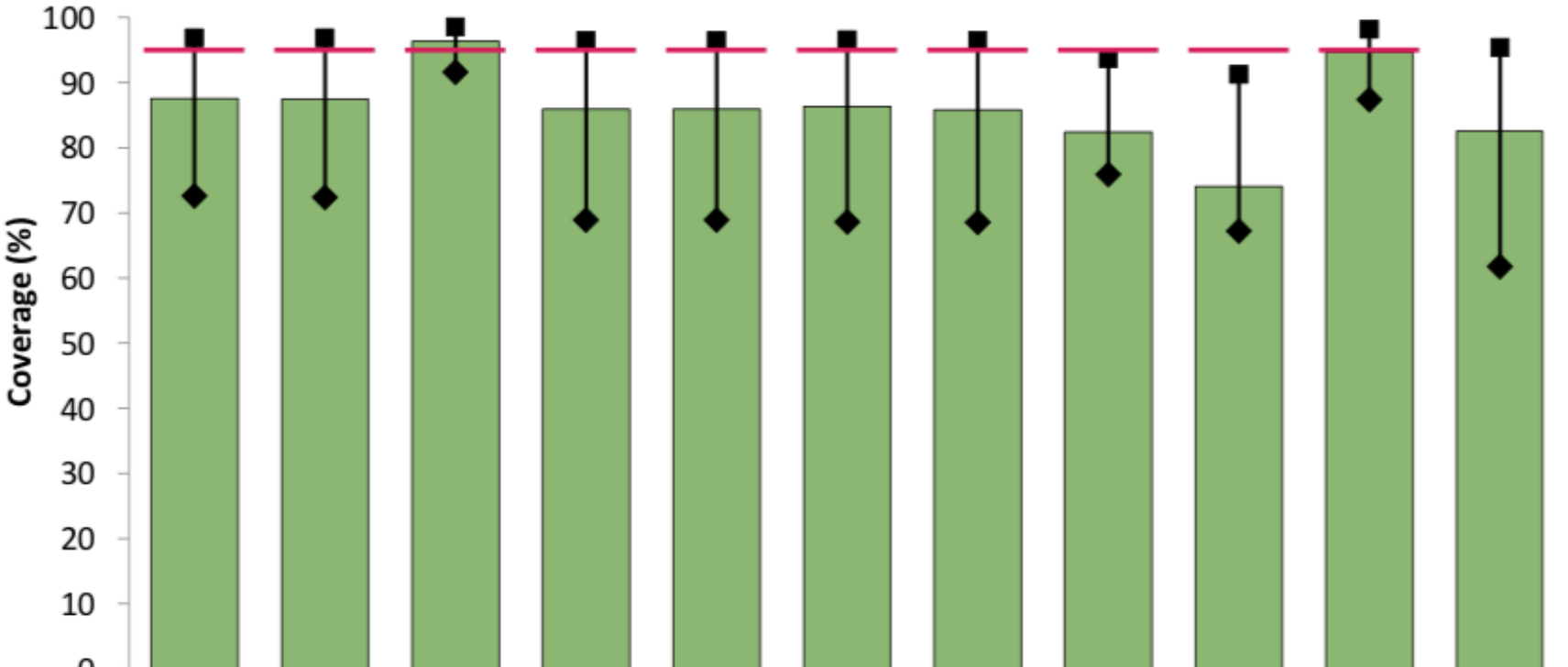
2017–18 School Year

Provincial immunization coverage for school-based programs



Grade 7 students

Figure 2. Immunization coverage in Ontario among children 7 years old: 2017–18 school year



	Meas	Mumps	Rubella	Dip	Tet	Polio	Pertuss	Hib	Pneum	MCC	Var
■ 2017-18	87.6	87.4	96.4	85.9	85.9	86.3	85.8	82.4	74.1	94.7	82.6
◆ PHU min.	72.6	72.4	91.6	68.9	68.9	68.6	68.5	75.9	67.2	87.4	61.7
■ PHU max.	96.8	96.8	98.5	96.5	96.5	96.6	96.5	93.7	91.2	98.2	95.4
— National Goal	95.0 ^A	95.0 ^A	95.0 ^A	95.0 ^A	95.0 ^A	95.0 ^A	95.0 ^A	95.0 ^B	95.0 ^B	95.0 ^B	^C

Figure 3. Immunization coverage in Ontario among children 17 years old: 2017–18 school year

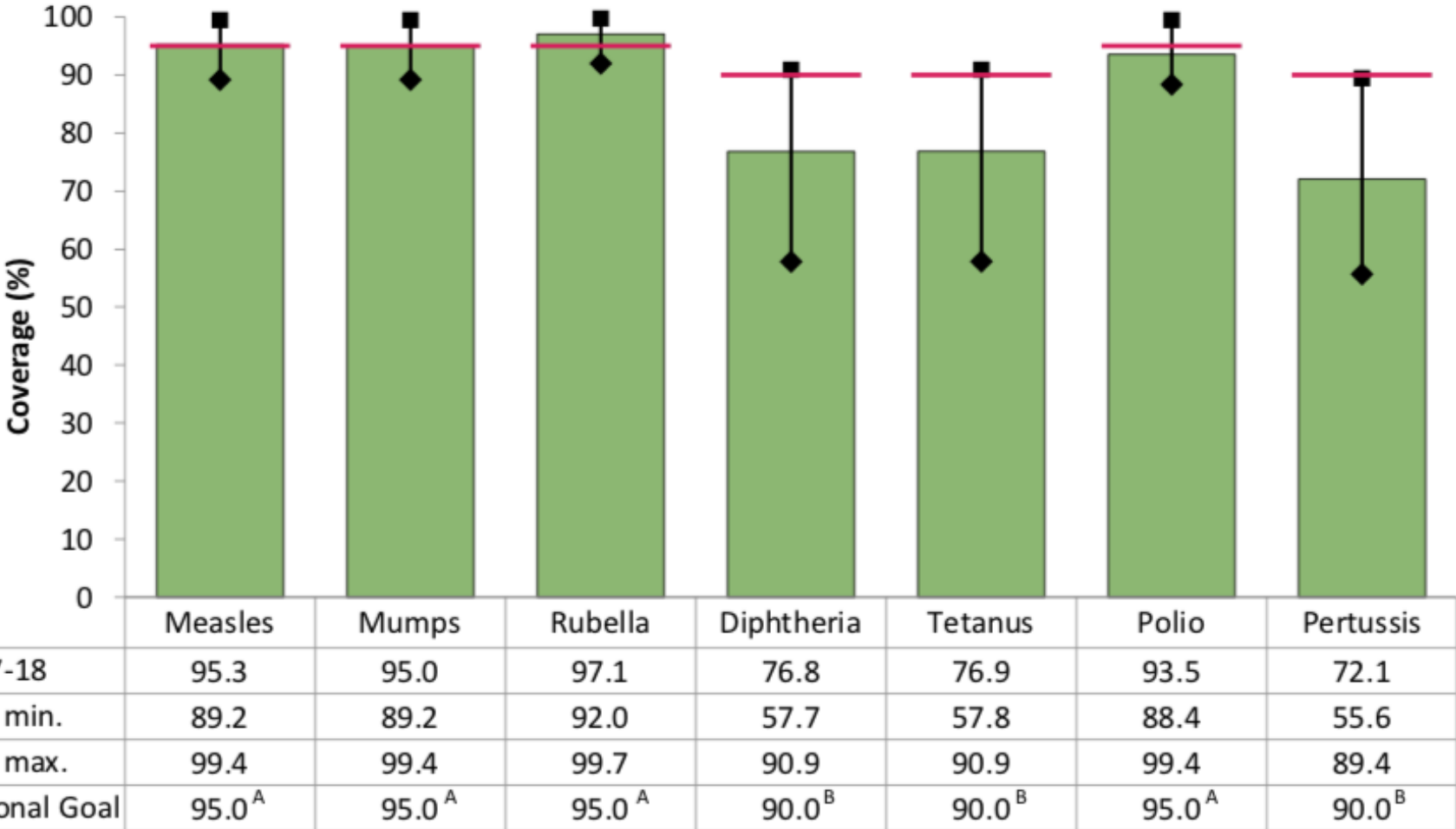
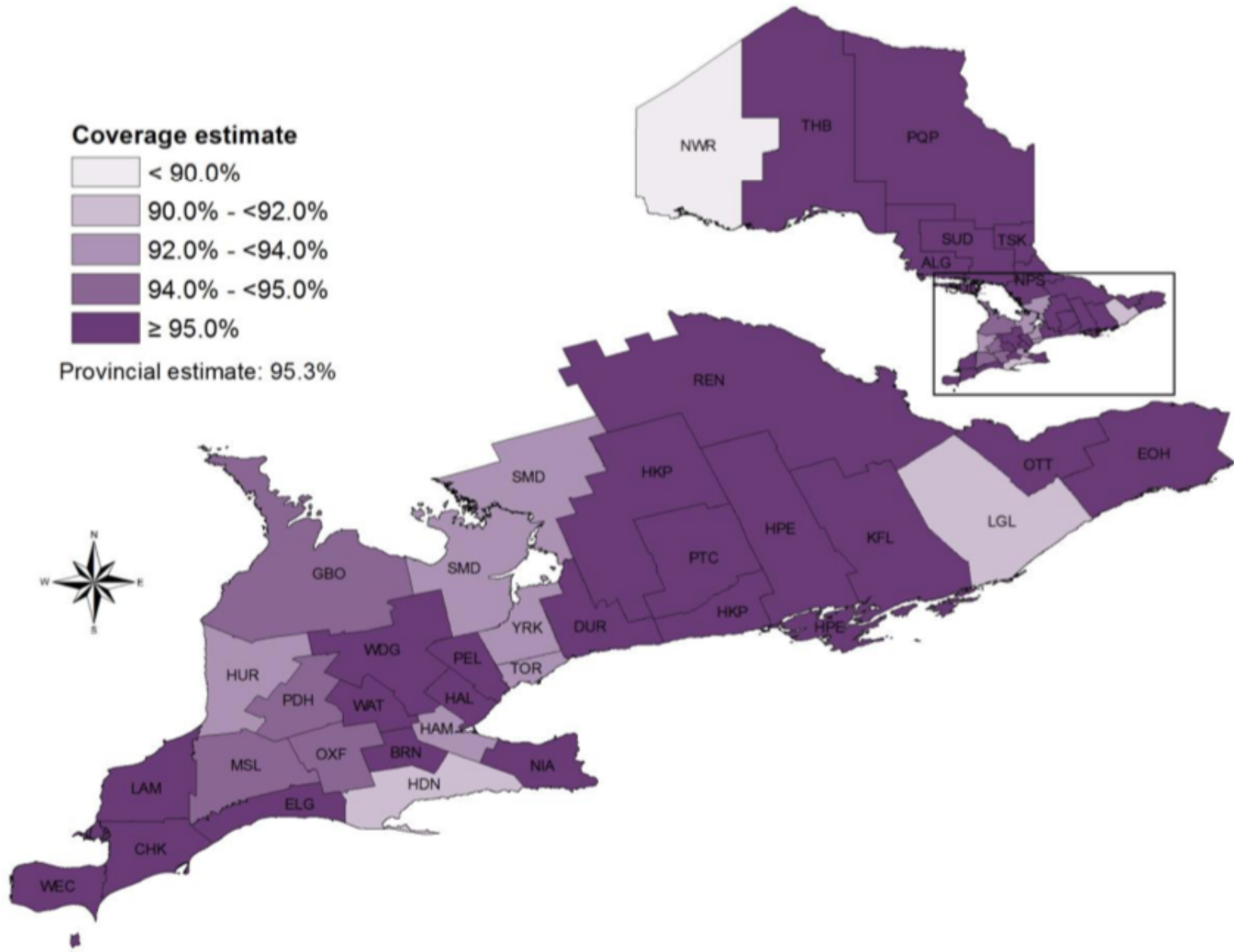


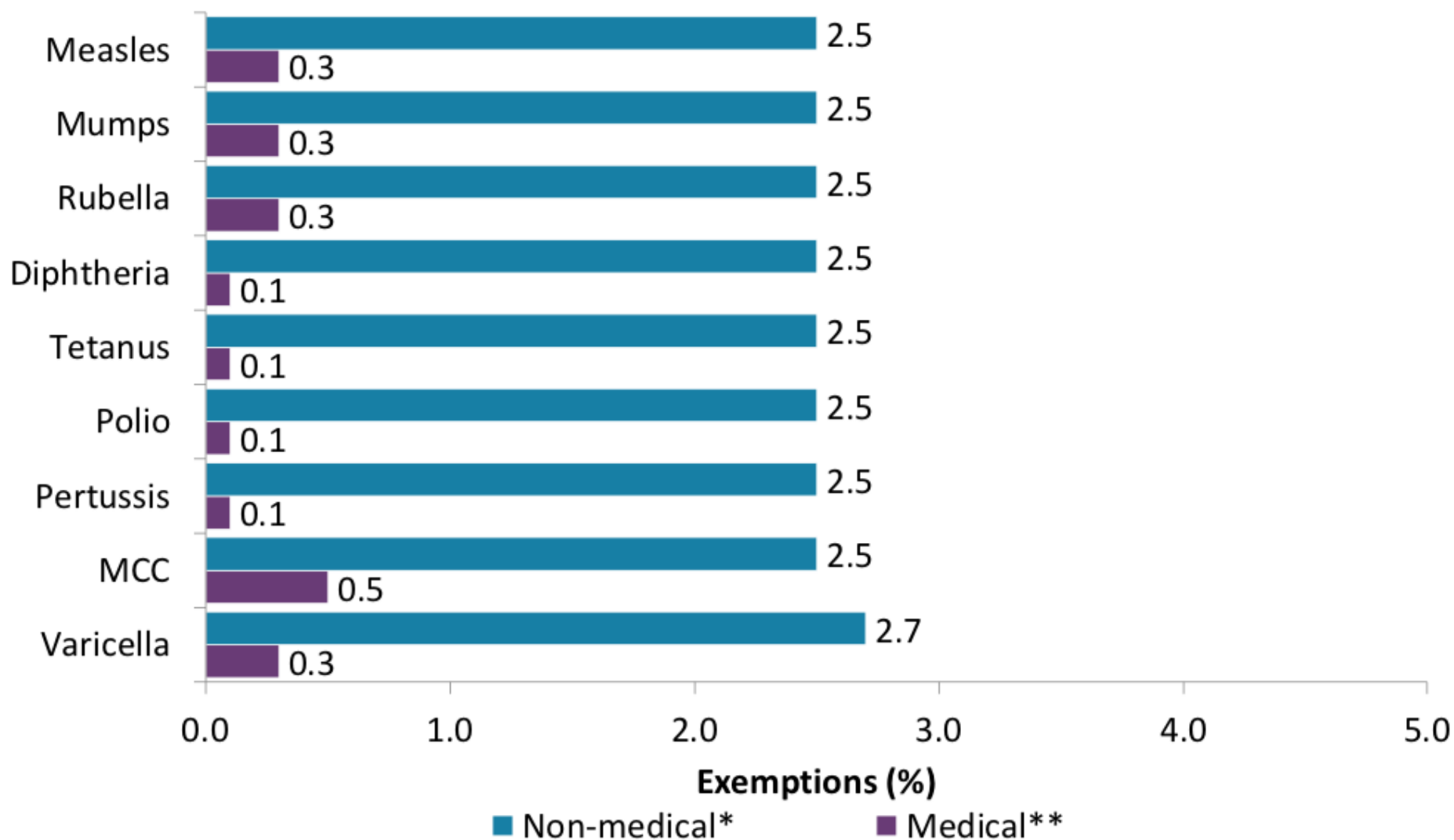
Figure 7. Immunization coverage in Ontario for measles among children 17 years old by public health unit: 2017–18 school year*



WHY do children not get vaccinated?

- caregivers unable to access medical care
 - lack of primary care provider
 - difficulties reaching primary care provider
 - lack of OHIP coverage
 - poor rapport with primary care provider
- caregivers forget about issue
- medical contraindication to vaccinations
 - true vs. perceived

Figure 12. Immunization exemptions for *ISPA* designated diseases in Ontario among children 7 years old: 2017–18 school year



WHY do children not get vaccinated?

- caregivers unable to access medical care
 - lack of primary care provider
 - difficulties reaching primary care provider
 - lack of OHIP coverage
 - poor rapport with primary care provider
- caregivers/care providers forget about issue
- medical contraindication to vaccinations
 - true vs. perceived
- vaccine hesitancy (intentional delay or refusal despite availability and lack of true contraindication)





VACCINE HESITANCY



The most important thing to do is LISTEN.

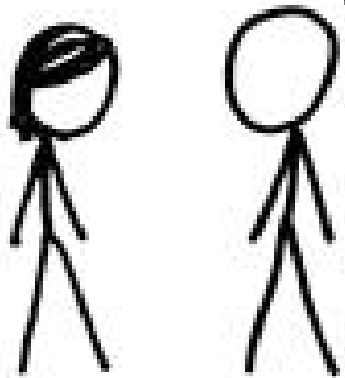
- ‘Could you tell me a little more about that?’
 - do they have references/literature?
- this obviously only works if the caregivers are in the right frame of mind...
- there are some common themes seen in many of these conversations:

1. Post hoc ergo propter hoc

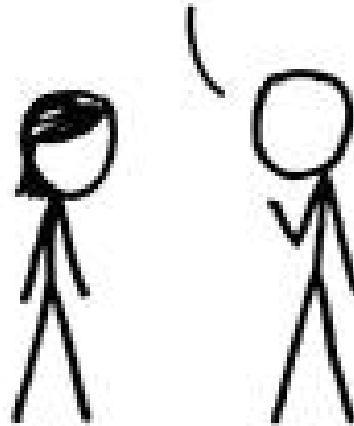




I USED TO THINK
CORRELATION IMPLIED
CAUSATION.



THEN I TOOK A
STATISTICS CLASS.
NOW I DON'T.



SOUNDS LIKE THE
CLASS HELPED.

WELL, MAYBE.

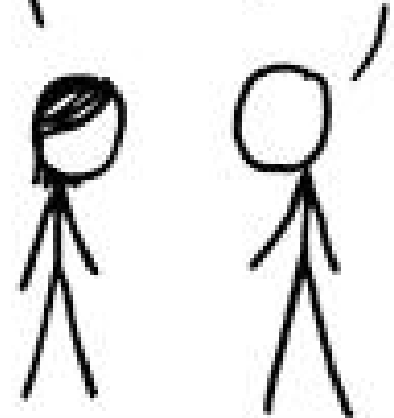


Table 3. Outcome Events in the 21-Day Risk Interval After Either Vaccine Dose Compared, on the Same Calendar Day, With Outcome Events in Individuals 22-42 Days After Their Most Recent Dose, December 14, 2020-June 26, 2021

Outcome	Events in risk interval (events/million person-years) ^a	Events in comparison interval (events/million person-years) ^{a,b}	Adjusted rate ratio ^c (95% CI) ^d	P value		Signal, 1-sided P < .0048 ^e	Excess cases in risk interval per million doses (95% CI) ^f
				2-Sided ^d	1-Sided		
Thrombotic thrombocytopenic purpura	6 (9.1)	2 (5.5)	2.60 (0.47-20.66)	.29	.23	No	0.3 (-0.6 to 0.5)
Cerebral venous sinus thrombosis ^g	7 (10.6)	3 (8.2)	1.55 (0.37-8.17)	.59	.41	No	0.2 (-1.1 to 0.5)
Transverse myelitis ^g	2 (3.0)	1 (2.7)	1.45 (0.10-47.73)	.82	.64	No	0.1 (-1.6 to 0.2)
Encephalitis/myelitis/encephalomyelitis	16 (25.7)	5 (13.7)	1.27 (0.45-4.10)	.69	.44	No	0.3 (-1.8 to 1.1)
Myocarditis/pericarditis	87 (131.7)	39 (106.9)	1.18 (0.79-1.79)	.44	.25	No	1.2 (-2.1 to 3.3)
Venous thromboembolism	626 (951.9)	327 (895.9)	1.16 (1.00-1.34)	.05	.03	No	7.5 (-0.1 to 14.0)
Immune thrombocytopenia	48 (72.6)	23 (63.0)	1.12 (0.65-1.97)	.70	.40	No	0.4 (-2.2 to 2.1)
Convulsions/seizures	285 (431.3)	150 (411.0)	1.04 (0.84-1.29)	.74	.39	No	0.9 (-4.8 to 5.6)
Acute myocardial infarction	613 (935.3)	375 (1030.2)	1.02 (0.89-1.18)	.75	.39	No	1.2 (-6.9 to 8.3)
Pulmonary embolism	503 (762.8)	290 (794.6)	1.01 (0.86-1.19)	.92	.48	No	0.4 (-7.2 to 6.9)
Bell palsy	535 (821.8)	301 (824.7)	1.00 (0.86-1.17)	.99	.52	No	0.0 (-7.9 to 6.7)
Stroke, ischemic	1059 (1611.8)	650 (1780.9)	0.97 (0.87-1.08)	.61	.70	No	-2.7 (-13.8 to 7.2)
Stroke, hemorrhagic	240 (364.7)	149 (408.2)	0.90 (0.72-1.13)	.37	.83	No	-2.3 (-8.3 to 2.5)
Thrombosis with thrombocytopenia syndrome	73 (112.0)	53 (145)	0.86 (0.58-1.27)	.45	.81	No	-1.0 (-4.6 to 1.4)
Appendicitis	762 (1178.9)	491 (1345.2)	0.82 (0.73-0.93)	.002	>.99	No	-14.8 (-25.5 to -5.3)
Guillain-Barré syndrome ^g	10 (15.1)	6 (16.4)	0.70 (0.22-2.31)	.53	.83	No	-0.4 (-3.0 to 0.5)
Disseminated intravascular coagulation	30 (45.4)	25 (68.5)	0.70 (0.39-1.28)	.25	.91	No	-1.1 (-4.1 to 0.6)
Kawasaki disease	0	2 (5.5)	0.00 (0.00-2.52)	.16	.16	No	-0.3 (-0.3 to 0.0)
Acute disseminated encephalomyelitis ^g	2 (3.0)	0	NE (0.07-NE)	.66	.66	No	0.2 (-2.5 to NE)

2. 'Compression'



Influenza risks

- 1 case of Guillain-Barre syndrome per million vaccinations
- 12 200 hospitalizations and 3500 deaths due to influenza *per year* in Canada
 - PLUS 17 cases of Guillain-Barre per million influenza infections!

THE NEW YORK TIMES BESTSELLER

THINKING,
FAST AND SLOW

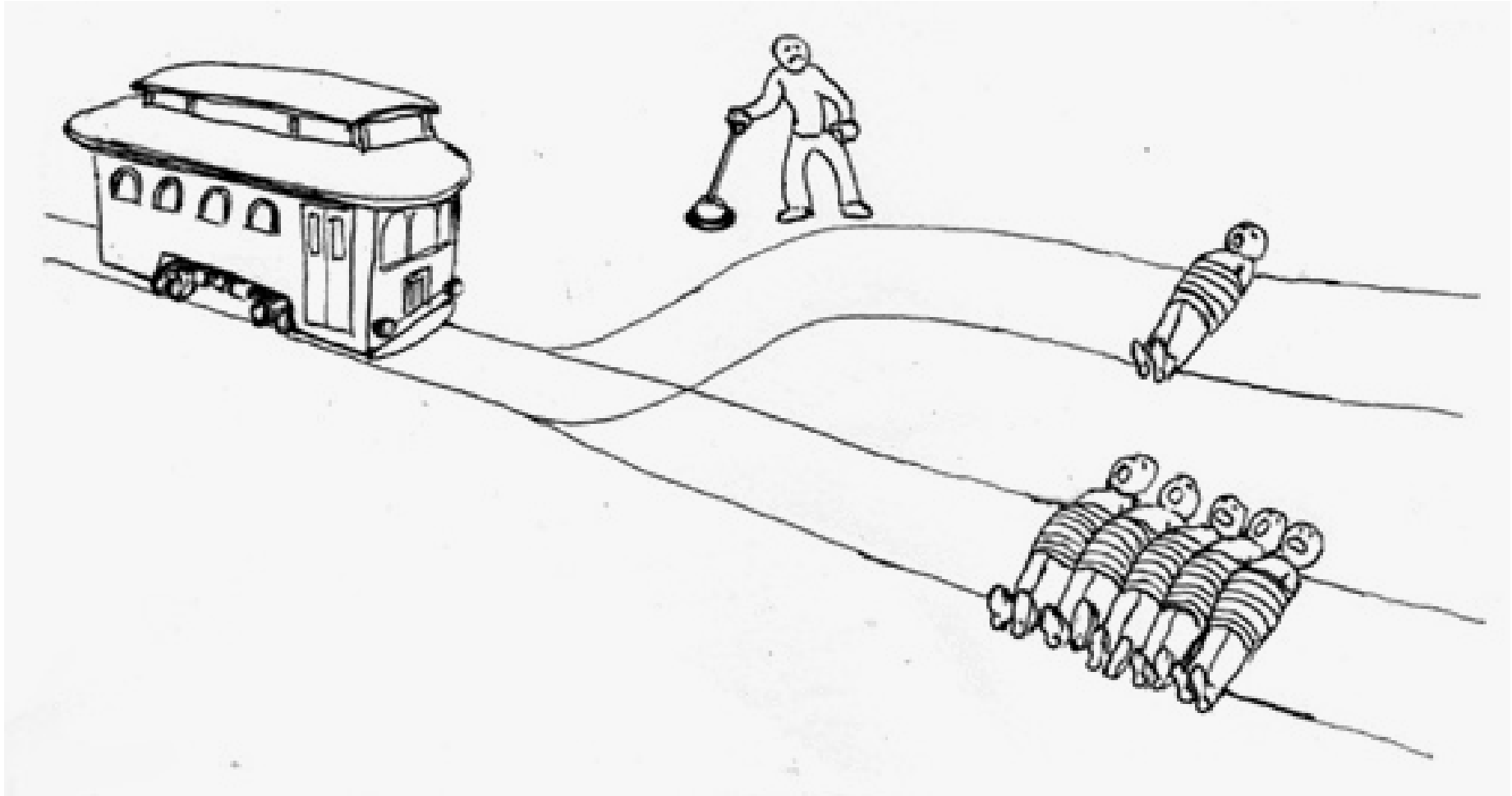


DANIEL
KAHNEMAN

WINNER OF THE NOBEL PRIZE IN ECONOMICS

"[A] masterpiece . . . This is one of the greatest and most engaging collections of insights into the human mind I have read." —WILLIAM EASTERLY, *Financial Times*

3. Omission bias



EDITORIAL

Delaying Vaccination Is Not a Safer Choice

Kristen A. Feemster, MD, MPH, MSHPR; Paul Offit, MD


4. Medical communication

THE LANCET

The Lancet, [Volume 351, Issue 9103](#), Pages 637 - 641, 28 February 1998
doi:10.1016/S0140-6736(97)11096-0

This article was retracted

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

Dr [AJ Wakefield](#) FRCS ^a , [SH Murch](#) MB ^b, [A Anthony](#) MB ^a, [J Linnell](#) PhD ^a, [DM Casson](#) MRCP ^b, [M Malik](#) MRCP ^b, [M Berelowitz](#) FRCPsych ^c, [AP Dhillon](#) MRCPath ^a, [MA Thomson](#) FRCP ^b, [P Harvey](#) FRCP ^d, [A Valentine](#) FRCP ^e, [SE Davies](#) MRCPath ^a, [JA Walker-Smith](#) FRCP ^a

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.

“evidence favors rejection of a causal relationship at the population level between MMR vaccine and autistic spectrum disorder...”

“the committee notes that its conclusion does not exclude the possibility that MMR vaccine could contribute to ASD in a small number of children...”

5. Perceived lack of expertise from health professionals

Common conversation topics

- how are different vaccine-preventable infections (VPIs) acquired?
- how common are the different VPIs?
- what are the consequences of infection with the different VPIs?
- what are the most common adverse events following immunization (AEFI) and what are their sequelae?
- how likely are the different AEFIs to recur?
- relative harms of vaccines vs. other medical interventions (eg. antibiotics)

6. Impact of anti-vax websites and social media



Contents lists available at [ScienceDirect](#)

Vaccine

journal homepage: www.elsevier.com/locate/vaccine



A postmodern Pandora's box: Anti-vaccination misinformation on the Internet

Anna Kata*

Department of Anthropology, Chester New Hall, McMaster University, 1280 Main St. W, Hamilton, Ontario L8S 4L8, Canada

Vaccine 30 (2012) 3778–3789



Contents lists available at [SciVerse ScienceDirect](#)

Vaccine

journal homepage: www.elsevier.com/locate/vaccine



Anti-vaccine activists, Web 2.0, and the postmodern paradigm – An overview of tactics and tropes used online by the anti-vaccination movement

Anna Kata*



Promoting immunization resiliency in the digital information age

Noni E MacDonald^{1*}, Eve Dubé²

CCDR • January 2, 2020 • Volume 46–1

So how do we counsel families regarding vaccines?

**What's
different in
the post-
COVID era?**

precipitously.

Public
Health
Ontario

Santé
publique
Ontario

SURVEILLANCE REPORT

Immunization Coverage Report for School-Based Programs in Ontario: 2019-20 and 2020-21 School Years

Figure 1. Immunization coverage for quadrivalent meningococcal conjugate (MCV4), human papillomavirus (HPV) and hepatitis B (Hep B) vaccines among 12-year-olds in Ontario: 2013–14 to 2020–21 school years

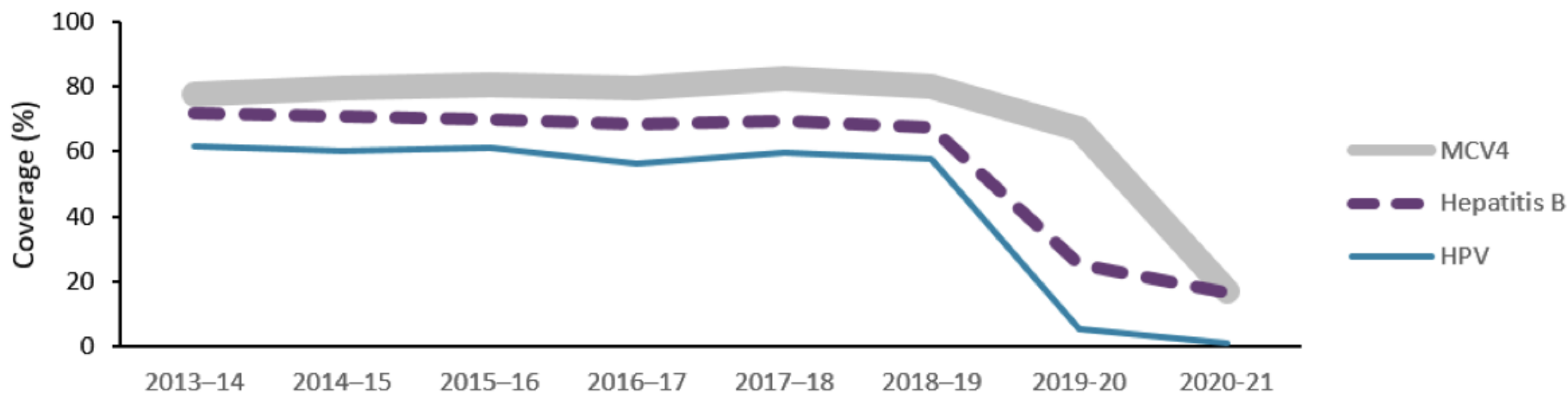
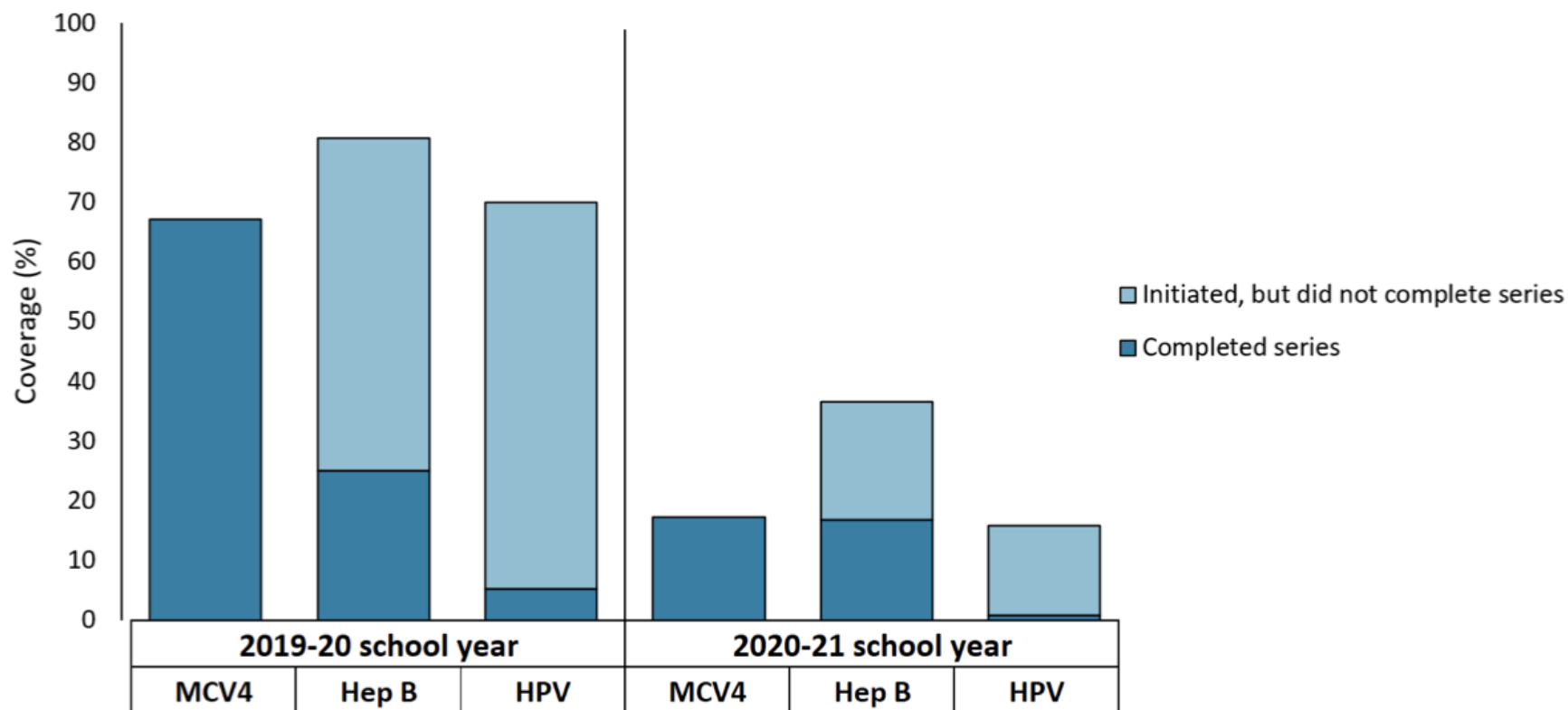


Figure 2a. Immunization coverage for school-based immunization programs among 12-year-olds in Ontario: 2019–20 and 2020–21 school years



Routine Vaccination Coverage — Worldwide, 2021

Audrey Rachlin, PhD^{1,2}; M. Carolina Danovaro-Holliday, MD³; Padraic Murphy, MPH⁴; Samir V. Sodha, MD³; Aaron S. Wallace, PhD²

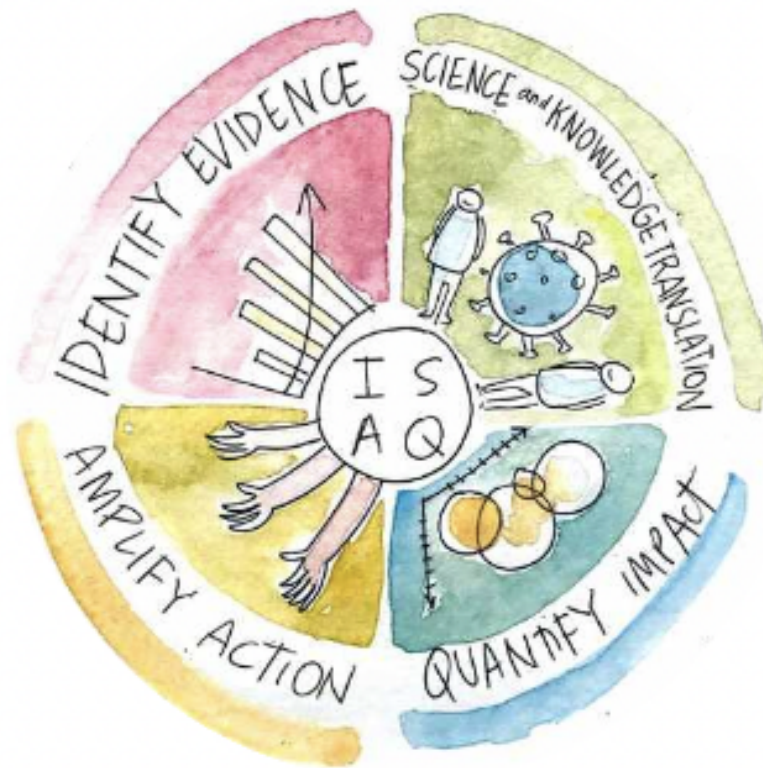
In 2021, the estimated global coverage with 3 doses of diphtheria-tetanus-pertussis-containing vaccine as well as the first dose of measles-containing vaccine decreased to 81%, the lowest level since 2008. Globally, 25.0 million children were unvaccinated or incompletely vaccinated in 2021, 5.9 million more than in 2019.

everyone.

- there is so much information that it was hard for experienced clinicians to know what is ‘true’!

Managing the COVID-19 infodemic

CALL FOR ACTION



World Health
Organization

infodemic
MANAGEMENT

The INFODEMIC confuses all of us.

- there is so much information that it was hard for experienced clinicians to know what is ‘true’!
- this has likely EXACERBATED previously-mentioned perceived lack of expertise of medical professionals



DEPARTMENT OF HEI

Health Research
Methodology

Bad information exists for various reasons.

- Disinformation: false information deliberately created to cause harm
- Malinformation: information that is based in reality and used to cause harm
- Misinformation: false information that is not created with the intention of causing harm



Measuring the impact of COVID-19 vaccine misinformation on vaccination intent in the UK and USA

Sahil Loomba ^{1,5}, Alexandre de Figueiredo ^{2,5} , Simon J. Piatek², Kristen de Graaf² and Heidi J. Larson ^{2,3,4} 

Widespread acceptance of a vaccine for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) will be the next major step in fighting the coronavirus disease 2019 (COVID-19) pandemic, but achieving high uptake will be a challenge and may be impeded by online misinformation. To inform successful vaccination campaigns, we conducted a randomized controlled trial in the UK and the USA to quantify how exposure to online misinformation around COVID-19 vaccines affects intent to vaccinate to protect oneself or others. Here we show that in both countries—as of September 2020—fewer people would ‘definitely’ take a vaccine than is likely required for herd immunity, and that, relative to factual information, recent misinformation induced a decline in intent of 6.2 percentage points (95th percentile interval 3.9 to 8.5) in the UK and 6.4 percentage points (95th percentile interval 4.0 to 8.8) in the USA among those who stated that they would definitely accept a vaccine. We also find that some sociodemographic groups are differentially impacted by exposure to misinformation. Finally, we show that scientific-sounding misinformation is more strongly associated with declines in vaccination intent.

Social media impact seems greater now.

HUMAN VACCINES & IMMUNOTHERAPEUTICS
2020, VOL. 16, NO. 11, 2586–2593
<https://doi.org/10.1080/21645515.2020.1780846>



Taylor & Francis
Taylor & Francis Group

COMMENTARY



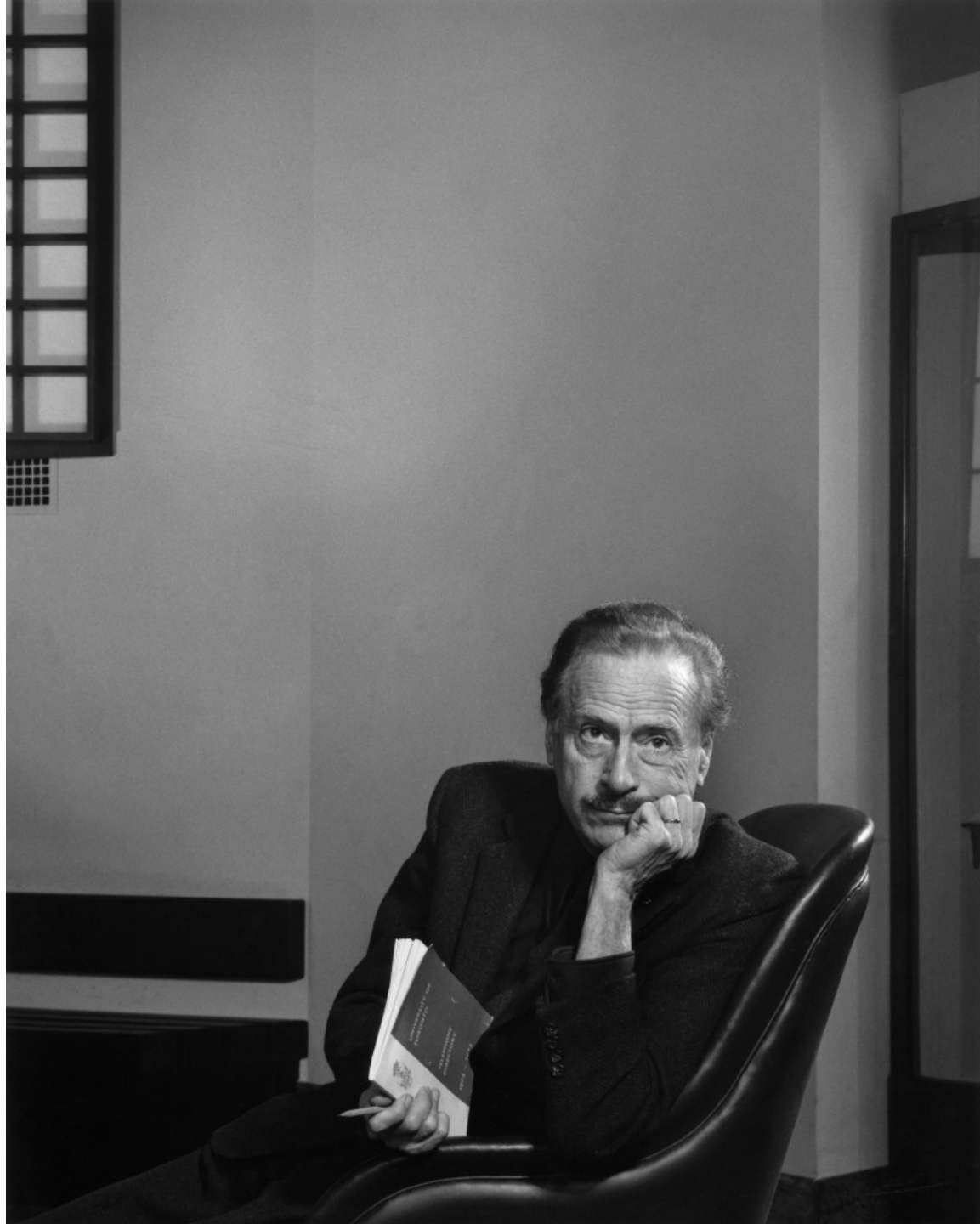
Social media and vaccine hesitancy: new updates for the era of COVID-19 and globalized infectious diseases

Neha Puri^{a*}, Eric A. Coomes^{b*}, Hourmazd Haghbayan^{c,d}, and Keith Gunaratne^a

^aDepartment of Medicine, University of Toronto, Toronto, Ontario, Canada; ^bDivision of Infectious Diseases, Department of Medicine, University of Toronto, Toronto, Ontario, Canada; ^cDivision of Cardiology, Department of Medicine, London Health Sciences Centre, Western University, London, Ontario, Canada; ^dDepartment of Social and Preventative Medicine, Université Laval, Québec, Canada

Many issues with social media messaging.

- no editorial curation or scientific vetting
- often anonymous people – but also frequently ‘bots’ designed to increase conflict
- algorithms facilitate the development of insular, like-minded communities
- anti-vaccine tweets/posts more likely to be re-tweeted or liked
- social media greatly facilitates access to anti-vaccine websites





ELSEVIER

Contents lists available at [ScienceDirect](#)

Vaccine

journal homepage: www.elsevier.com/locate/vaccine



Canadian parents' perceptions of COVID-19 vaccination and intention to vaccinate their children: Results from a cross-sectional national survey



Robin M. Humble^a, Hannah Sell^{a,b}, Eve Dubé^c, Noni E. MacDonald^d, Joan Robinson^e, S. Michelle Driedger^f, Manish Sadarangani^g, Samantha B. Meyer^h, Sarah Wilsonⁱ, Karen M. Benzies^j, Samuel Lemaire-Paquette^k, Shannon E. MacDonald^{a,*}

Many parents were surveyed.

- national web-based survey, in French and English only, Dec 2020
- adapted from a similar survey done in 2018 looking at routine childhood vaccines
- n=1702 parents (55% women, 55% university-educated, 52% household income >80K)

Parents' COVID-19 vaccination intention for their children (outcome variable)			
If a safe and effective COVID-19 vaccine is available, I will get my child/children vaccinated	Agree	1074	63.1
	Disagree/Neutral	628	36.9
Parents' COVID-19 vaccination intention for themselves			
If a safe and effective COVID-19 vaccine is available to me, I plan to get vaccinated	Agree	1100	64.6
	Disagree/Neutral	602	35.4
Receipt of routine childhood vaccination			
Pre-pandemic routine pre-school vaccines received for children 0–6 years old	All vaccines received	761	81.1
	Some vaccines received	106	11.3
	No vaccines received	59	6.3
	Don't know	12	1.3
Pre-pandemic routine school aged vaccines received for children 7–17 years old	All vaccines received	869	83.5
	Some vaccines received	105	10.1
	No vaccines received	46	4.4
	Don't know	21	2.0
Pre-school and school-aged children combined: Pre-pandemic routine vaccines received for children 0–17 years old	All vaccines received	1381	81.1
	Some vaccines received	207	12.2
	No vaccines received	84	4.9
	Don't know	30	1.8
Receipt of childhood influenza vaccination			
Child(ren) received influenza vaccine last year	All children received	643	37.8
	Some children received	104	6.1
	No children received	874	51.4
	Children not eligible in their jurisdiction	38	2.2
	Don't remember	43	2.5
Parents' perceptions of COVID vaccines (not specific to children)			
Believe vaccination against COVID-19 is necessary	Agree	1191	70.0
	Disagree/Neutral	511	30.0
Confident that the COVID-19 vaccines will be safe	Agree	927	54.5
	Disagree/Neutral	775	45.5
Constraints won't prevent access to the COVID-19 vaccine	Agree	1061	62.3
	Disagree/Neutral	641	37.7

intention.

- more likely to vaccinate:
 - spoke languages other than English/French/Indigenous at home
- less likely to vaccinate:
 - did not intend to vaccinate themselves***
 - concerns about vaccine safety
 - didn't previously immunize against influenza
- no significant relationship between acceptance of routine vaccines and intention to vaccinate

Epidemiology of Myocarditis and Pericarditis Following mRNA Vaccination by Vaccine Product, Schedule, and Interdose Interval Among Adolescents and Adults in Ontario, Canada

Sarah A. Buchan, PhD; Chi Yon Seo, MSc; Caitlin Johnson, MPH; Sarah Alley, MPH; Jeffrey C. Kwong, MD; Sharifa Nasreen, PhD; Andrew Calzavara, MSc; Diane Lu, MD; Tara M. Harris, MHS; Kelly Yu, MPH; Sarah E. Wilson, MD

Outcomes at least 90 days since onset of myocarditis after mRNA COVID-19 vaccination in adolescents and young adults in the USA: a follow-up surveillance study

Ian Kracalik, Matthew E Oster, Karen R Broder, Margaret M Cortese, Maleeka Glover, Karen Shields, C Buddy Creech, Brittney Romanson, Shannon Novosad, Jonathan Soslow, Emmanuel B Walter, Paige Marquez, Jeffrey M Dendy, Jared Woo, Amy L Valderrama, Alejandra Ramirez-Cardenas, Agape Assefa, M Jay Campbell, John R Su, Shelley S Magill, David K Shay, Tom T Shimabukuro, Sridhar V Basavaraju, for the Myocarditis Outcomes After mRNA COVID-19 Vaccination Investigators and the CDC COVID-19 Response Team

 OPEN ACCESS

 Check for updates

Incidence, risk factors, natural history, and hypothesised mechanisms of myocarditis and pericarditis following covid-19 vaccination: living evidence syntheses and review

Jennifer Pillay,¹ Lindsay Gaudet,¹ Aireen Wingert,¹ Liza Bialy,¹ Andrew S Mackie,² D Ian Paterson,^{3,4} Lisa Hartling¹

HUMAN VACCINES & IMMUNOTHERAPEUTICS
2022, VOL. 18, NO. 1, e2028516 (3 pages)
<https://doi.org/10.1080/21645515.2022.2028516>



LETTERS

OPEN ACCESS Check for updates

COVID-19 vaccination in 5-11 years old children: Drivers of vaccine hesitancy among parents in Quebec

Eve Dubé ^{a,b}, Dominique Gagnon^a, and Catherine Pelletier^b

Why vaccinate children aged 5 to 11? That's the question. [...] We were asked to vaccinate to protect ourselves and others. We are 95% vaccinated. That's good. The people who need to protect are protected. Why are we asking our children to have this vaccine? For what purpose? In order to protect themselves? They are not at risk. To protect others? They are all already vaccinated. I'm sorry. There is no reason for our little ones to be vaccinated. (Parent, Focus Group no2, Nov 9, 2021)

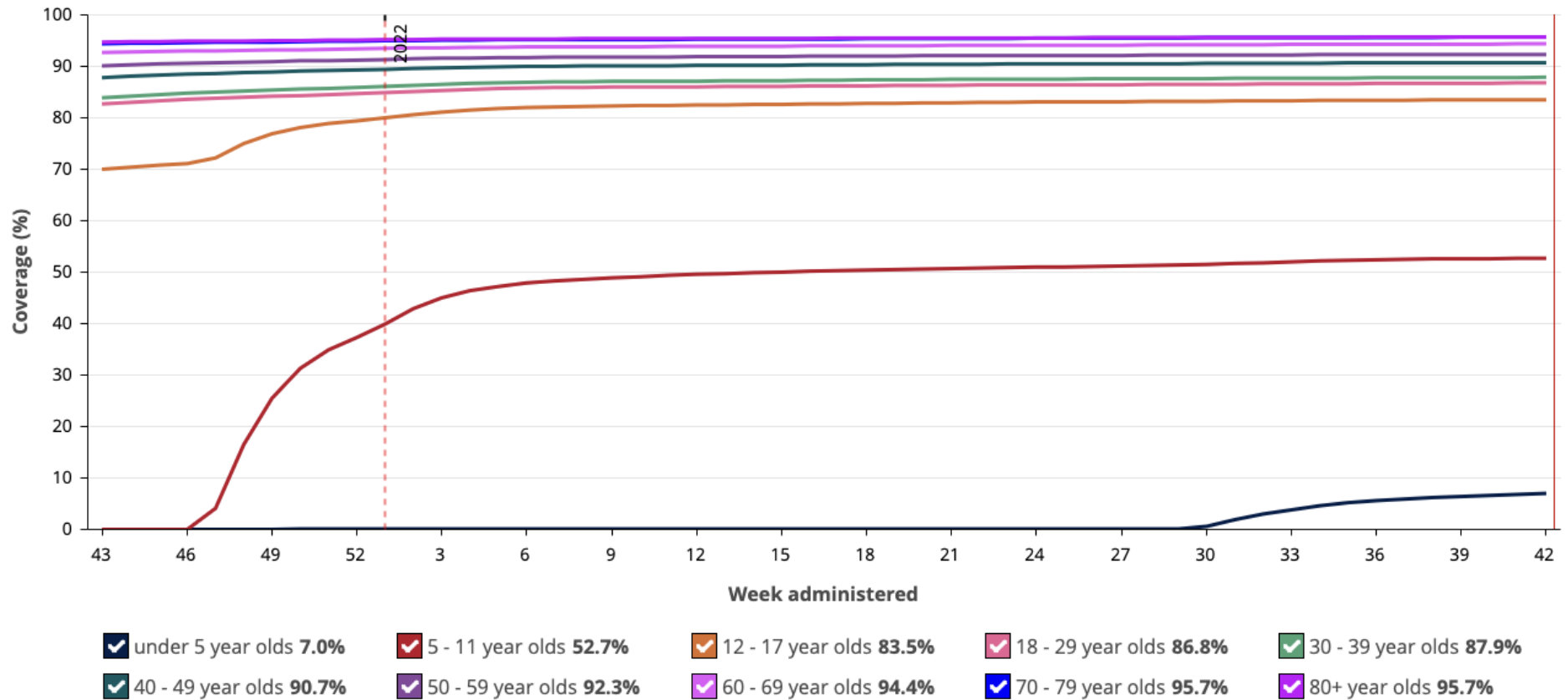
I find it difficult that they [the children] have that burden to carry and I find it ungrateful, actually. I think it's using children. As was mentioned, we have 90% of the population vaccinated. I don't think that the small percentage of children between the ages of 5 and 11 is going to change the game to the point where everything can change. I have the impression that we are in something "political" and at this level, it bothers me a lot. (Parent, Focus Group no2, Nov 9, 2021)

Multiple themes were identified.

- wanting to prevent disease transmission
- concern about possible AEFIs (note made of ‘rapid development’ of vaccine)
- children have less decision-making capacity (than adolescents)
- concern about ‘political pressure’
- problem of intolerance and polarization of ideas

Where are we now?

- Children's COVID-19 Vaccine Table met regularly in 2021...then much less
- lots of effort to facilitate adolescent immunization and provide guidance, telephone support, etc.
- much less success with 5-11 year vaccine rollout despite the much lower risk of cardiac toxicity
- essentially no Vaccine Table involvement with <5 year rollout – and many PHUs did not have vigorous publicity campaigns



It will probably take quite a while for vaccine coverage to increase.

era)

1. Most vaccine hesitant parents I have met are reasonable, caring people who just want to do the best they can for their children.
2. Our human qualities often interfere with us making rational decisions, about vaccines and everything else in life.
3. It is important to work with families as much as possible to ‘get them to a YES.’

era)

1. Immunization coverage for routine childhood vaccines has noticeably dropped.
2. There probably are many fewer parents who are undecided about COVID-19 vaccines.
3. There is probably MORE reliance on social media and/or peer group behaviour and LESS reliance on medical professionals now.
4. It will be a long way back. Careful listening and non-judgmental support even more important.



Thank you!!

J Pernica

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