

# Vaccines, values and science

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**W**ith a scientific consensus overwhelmingly supportive of childhood vaccination as a safe and effective means of preventing serious illness, and strong communication of the evidence to the Canadian public, persistent vaccine hesitancy is frustrating for many health care workers. But the common assumption that members of the public just do not understand the science mischaracterizes the problem of vaccine hesitancy and misdirects public health outreach by mistaking how science operates in society. Instead, vaccine hesitancy signals poor public trust in medico-scientific institutions, and work must be done to strengthen that trust.

Like other public controversies over scientific claims, disagreements over the safety and efficacy of vaccines commonly unfold as battles over scientific evidence. Against the huge body of literature supporting the scientific consensus view, opponents pick out selective, and often disreputable, counter-evidence. From there, arguments over the evidence ensue. It therefore may seem reasonable for defenders of the scientific consensus to characterize public resistance to scientific claims as stemming from poor scientific literacy or a destructive cultural embracing of antiexpertise. Yet, this characterization is mistaken.

If misunderstanding and misinterpretation of the scientific evidence were the problems, the provision of accurate information and education would presumably correct this. Many years of education campaigns have not substantially decreased numbers of vaccine refusers. Fortunately, those numbers remain low in Canada. Vaccine hesitancy, however, is slowly ticking upward. Public health organizations worry



about reaching that tipping point, risking disease outbreaks more on the scale seen in Italy, France and Romania.

Another reason to think poor science literacy is not the root of the problem is that vaccine hesitators tend to be well-educated — holders of university degrees or higher.<sup>1</sup> The more likely story is that those with higher education are putting their critical thinking skills to use; some are reading the scientific papers, and many more are allegedly “reading between the lines” to see what the establishment does not want them to see.

The frustrating lack of traction in public health outreach has engendered the damaging suspicion that vaccine refusers cannot be reasoned with,<sup>2</sup> thereby warranting a “hard line approach”<sup>3</sup> that includes physicians dismissing unvaccinated patients from their practices and severe restriction or elimination of nonmedical exemptions

for vaccines. Public backlash and hardened antivaccine views will likely result from such measures, so is there another way to address this problem?

What does not get considered in these heated discussions is that the trenchant public health effort to educate the public with reams of hard data is falling short because it is not scientific illiteracy and online misinformation that are driving vaccine hesitancy and refusal. Instead, it is a problem of public mistrust of scientific institutions. We see this in the social science research into parents’ vaccine hesitancy and refusal. Parents frequently cite discomfort with medicine’s close ties to the pharmaceutical and biologics industries.<sup>4</sup> Whether or not the misgivings are warranted is not the point; public health cannot reach its immunization goals without public trust, and members of the public are signalling a point of discord that requires

attention. Those misgivings are far from the wild conspiracy theories that researchers have tried to link to “antivax” views. Instead they are fissure points that are then seemingly confirmed when parents have their questions shut down by their health care providers. New parents are educated to see themselves as allies in their children’s health care, so they may wonder why the subject of vaccines elicits such a different response from their providers.

But what does this have to do with nonexperts challenging the scientific consensus? Surely the critics overstep in their knowledge and expertise, which seems to suggest that some misunderstanding of the science is also at play.

Epistemology, the branch of philosophy that investigates how we know what we know, has established epistemic trust as a key determinant of our knowledge.<sup>5</sup> Epistemic trust means accepting someone’s testimony about a knowledge claim based on the assumption that the testifier is a reliable source. Because there is too much specialized knowledge for any of us to independently study all matters of relevance, we take a lot of what we know on trust. This is true of scientists building on the research of other scientists or working in large collaborative projects, and it is also true of members of the public trying to make wise health choices such as whether or not to vaccinate. The public look to experts and take or refuse advice based on the perceived trustworthiness of the expert and the institutions the expert represents.

Putting trust in experts must be done with care. Epistemically dependent nonexperts are vulnerable to being unwittingly deceived by bad expert advice. When facing predictive uncertainty over important questions like, “Will my child be harmed by vaccines?,” nonexperts bridge those knowledge gaps, uncertainties and risks with “leaps of faith,” a “suspension or bracketing-off of uncertainties.”<sup>6</sup> This trusting leap is taken when the nonexpert is sufficiently confident that the expert will exercise their judgment competently and inform nonexperts honestly; without this assurance, the leap will be denied.

Thus, there is both an epistemic and a moral expectation placed on experts that direct public uptake of scientific advice, including consensus claims. If nonexperts

find themselves unsure of the integrity of expert advice, even the sheer number of signees to the scientific consensus will do little to convince. A large number of untrustworthy experts has no more epistemic legitimacy than one unscrupulous scientist, after all. There is no question that the public benefits from well-placed trust in expert advice. The challenge is knowing when trust is well placed.

Much of what members of the public know about vaccines pivots on epistemic trust. Tied to the consensus statement is a claim to the epistemic and moral legitimacy of its authors and their institutions. The mechanisms used to ensure the trustworthiness of consensus claims are largely shielded from public view. The public must trust that the consensus was established rigorously and honestly. When vaccine hesitators reject consensus claims, they are refusing to take that trusting leap.

Framing public resistance to scientific claims as a war on science and expertise misconstrues how science operates in society. Science’s embattled defenders envision science cutting through partisan politics and confusion to produce optimal policies and social benefit. Yet science and society are far more entangled. Trust is a crucial determinant of the success of this relationship.

To confront public resistance of scientific claims, what if focus were placed on building and maintaining that trust rather than educating the misinformed public or puzzling over their moral and epistemic failings? Doing this does not discount that public health agencies have the science on their side. It does mean that having the best science is not enough. Here we have a different picture of science in relation to the public than science anchoring democratic decision-making. Science should still be understood to hold firm ground, but the idea that the evidence speaks, or dictates right policy, is a fiction. All evidence is subject to interpretation, and political and policy decision-making requires numerous nonscientific considerations. Scientific evidence operates within a constellation of social influences that guide personal decision-making and policy formation. Good public relations ensure that science stands prominently within social frameworks.

Trust is built and maintained in relationships that are respectful, open and honest.<sup>7</sup>

Primary care providers must have the time to respond patiently and nonjudgmentally to parents’ questions, and to build on shared goals like ensuring children’s health and safety. Patients also want honest information, which may require admitting to gaps in the research, for example, regarding what causes serious adverse events. Admitting to uncertainty does not undermine trust, as patients look for providers who have their interests at heart more than they look for unequivocal scientific pronouncements.

Most challenging for health care operations is an urgent need to reconfigure industry ties to health care practice. Empirical research shows lower public trust in scientists and physicians who are perceived to suffer from financial conflicts of interests or loss of independence.<sup>7</sup> Disclosure statements and sunshine lists are not enough to ensure the levels of public confidence needed to stave persistent vaccine hesitancy. For those who think curtailed industry ties and longer appointment times to talk to patients are impossible demands on health care systems, consider that so too is the public health burden of vaccine hesitancy and refusal.

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