

REVIEW

To close the childhood immunization gap, we need a richer understanding of parents' decision-making

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ABSTRACT

Vaccination is widely acknowledged as one of the most successful public health interventions globally and in most high-income countries childhood vaccination coverage rates are moderately high. Yet in many instances, immunisation rates remain below aspirational targets and have shown only modest progress toward those targets in recent years, despite concerted efforts to improve uptake. In part, coverage rates reflect individual parents' vaccination attitudes and decisions and, because vaccination decision-making is complex and context-specific, it remains challenging at individual and community levels to assist parents to make positive decisions. Consequently, in the search for opportunities to improve immunisation coverage, there has been a renewed research focus on parents' decision-making. This review provides an overview of the literature surrounding parents' vaccination decision-making, offering suggestions for where efforts to increase vaccination coverage should be targeted and identifying areas for further research.

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Introduction

Globally, vaccination is estimated to save 2 to 3 million lives per year.¹ In many high-income countries, childhood vaccination coverage rates are moderate to high.^{2–4} Like other high-income countries, Australia has a comprehensive subsidized vaccination program for children and adults, and vaccination coverage remains moderately high, with 92.3% of children at 12 months of age fully vaccinated in 2015.⁴ Yet coverage remains below the nation's aspirational target of 95%.⁵ The 2.7% gap between current vaccination coverage levels and the nation's target may seem small, but progress in narrowing that gap has been modest in recent years, with coverage rising from 90.9% in 2005 to 92.3% in 2015 for children at 12 months of age.⁴ As reported in the US³, UK² and Canada⁶, this gap in Australia is much wider in some areas where there is clustering of vaccine refusers.⁷ Contrary to a popular perception that conscientious objection to vaccination is increasing in Australia, a review found little change since 2001, with an estimated 3.3% of children having a recorded objection including 1.8% with no vaccines recorded.⁷ While the impact on Australian coverage rates of the 'No Jab No Pay' legislative changes⁸ that removed conscientious and religious objection as eligibility criteria for immunization-linked family assistance payments is not yet visible, it is unlikely that all previous objectors will comply with the new requirements to retain eligibility for payments. If the nation is to reach the target, research efforts must focus on better equipping providers and public health agencies to guide parents through the vaccination decisions they make on behalf of their children.

This review provides an overview of the literature surrounding parents' decision-making about vaccination, offers suggestions for where provider and public health agencies' efforts to increase vaccination coverage should be targeted and areas for further research.

Despite the wide acceptance of vaccination as one of the most successful public health interventions globally and the extensive body of supporting evidence, not all parents choose to vaccinate their children according to recommended schedules.⁹ There is concern internationally within public health agencies and some community sectors that vaccines are losing public confidence.¹⁰ Surveys and other observations from across the globe support these concerns. In their analysis of responses to the 2009 National Immunization Survey of 11,206 US parents of 24–35 month old children, Smith et al. found that 39.6% of parents had delayed and/or refused vaccines.¹¹ In its 2015 report, the National Vaccine Advisory Committee concluded that as many as one in 5 US parents were not fully confident in the safety or importance of vaccines.¹² In Australia, surveys conducted in the state of New South Wales showed that the proportion of parents caring for children aged 2 months to 4 y who expressed strong support for immunisation significantly decreased from 86.1% in 2001 to 64.8% in 2009/10.^{13,14} In the UK in 2015, 24.5% of 2,055 surveyed parents of children aged 5 y and under were hesitant about vaccines and for 79% of hesitant parents, confidence issues were the main driver of hesitancy.¹⁵ Further, reported associations between higher levels of non-medical exemptions

from school-entry vaccination requirements and outbreaks of vaccine-preventable disease¹⁶⁻¹⁹ have fuelled public and academic debate within the US, the UK, Europe and Australia about appropriate public policy responses.²⁰⁻²⁵ As Kennedy et al.²⁶ observed, “High immunization rates are not the same thing as high confidence in vaccines.” Loss of parental confidence in vaccination could mean that Australia’s 95% target will remain an aspiration rather than becoming a reality.

Low vaccination coverage can have disastrous consequences for individuals and communities. Decisions to delay or avoid vaccination not only expose individuals to increased risk of disease but can also undermine herd immunity and increase the frequency and severity of outbreaks of vaccine preventable diseases (VPDs). Observations of outbreaks demonstrate that these dangers are heightened in communities where non- or partially-vaccinating parents live in close proximity; disease modeling suggests that clustering of non-vaccinators may increase the magnitude of epidemics, with the detrimental effects being greatest when vaccination levels are close to those required for herd immunity.²⁷ To support herd immunity, parents are often asked to consider wider societal interests in addition to their own child’s interests. However, a review²⁸ found variable impacts on parents’ decisions in a heterogeneous range of studies and a more recent study²⁹ found no additional benefit of emphasizing societal benefit over benefit to the child.

To review the relevant literature, online full-text articles in English were identified using OVID database searches (MEDLINE, PsychINFO, Embase, CINHALL, The Cochrane library) of journals available to the authors with preference for articles published since 2000. Initial searches included combinations of expanded MeSH terms immunisation/vaccination, decision-making and parents. In addition, ahead-of-print articles identified by alerts set on tables of contents of key English language vaccination and public health journals were accessed as they became available. Sources cited in influential articles were also accessed as were online items located using Google searches.

Factors affecting decision-making

Vaccination is a preventative behavior for which the benefits to the individual may not be directly observable particularly when the incidence of VPDs appears to be low. To maintain high vaccination levels it is necessary to understand why some parents choose to delay or refuse vaccination. Vaccination decision-making is complex and context specific, varying across time,

place and vaccines, making it challenging at individual and community levels to assist parents to make positive decisions.³⁰ Several authors have drawn on adaptations of the behavioral-ecological model to describe the decision-making environment.³⁰⁻³³ This model describes factors at 5 levels that influence health behaviors: the intrapersonal, interpersonal, institutional, community and public policy levels. Parents arrive at their decisions in an environment comprised of these multiple layers that interact in complex ways that are not equally understood in terms of either their individual contribution to decision-making or the interactions among them. **Figure 1** depicts these levels and provides examples of factors operating at each level.

Intrapersonal factors (those emanating from parents’ own experiences, risk perceptions and world views) contributing to parental delay or refusal of vaccination are numerous and multifaceted, with vaccine safety worries among the most prominent. The range of safety concerns is wide, but they share common features including: having uncertain etiology; onset around the time of age-related vaccination milestones; apparent increasing incidence alongside increasing vaccination offerings; seemingly plausible vaccine-related biological mechanisms and feared outcomes.³⁴ In addition, some parents believe that diseases targeted by vaccines are infrequent and mild, making vaccination unnecessary; that available vaccines are ineffective and/or that governments, healthcare providers and pharmaceutical companies are not trustworthy.³⁵ Other commonly cited concerns are preferences for naturally-acquired immunity, often accompanied by downplay of the risks from infection, and that because of the number and frequency of vaccines in childhood schedules, children will experience “antigenic overload” which will increase the risks of unknown or life-changing harmful side-effects and weaken the developing immune system.³⁶ An apparently antithetical concern is the under-development of infants’ immune systems because vaccination and other aspects of contemporary life may result in reduced exposure to immunogens– the so-called hygiene hypothesis.³⁷ Further, some commentators assert that the cumulative impact of undesirable consequences of vaccination results in unvaccinated children being healthier than vaccinated children.³⁸

A systematic review of decision support needs of parents making child-health decisions found that access to information, having a sense of control over the decision-making process and talking to others, including perceived pressure from others, are factors that were consistently identified as being important to parents.³⁹ These factors represent a mix of the interpersonal,

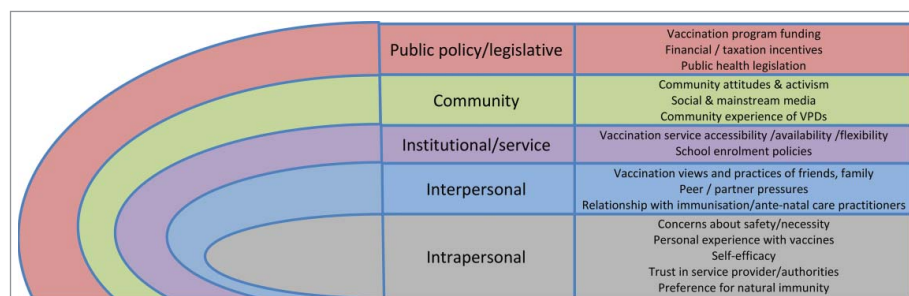


Figure 1. A behavioral-ecological model of vaccination decision-making. The five levels and example factors. Adapted from The Academy of Nutrition and Dietetics.⁸⁸

institutional (or service delivery) and community levels within the behavioral-ecological model. While a large majority of parents have high regard for health care providers as vaccination advisors, other members of parents' social networks including partners, other family members and friends also strongly influence decisions. Resources such as books, journal articles and the internet influence vaccination decisions too, but to a lesser extent.^{28,40}

There is a vast array of information about the safety, effectiveness and necessity of vaccines, with many parents accessing the internet for advice. The internet in the Web 2.0-era supports greater user interactivity, rapid and wide sharing of personal views and experiences and an abundance of free advice which may be in the form of evidence-based decision-aids or misinformed opinion. Parents with lower health and/or digital literacy, lower numeracy and lower cognitive ability are less well-equipped to evaluate the quality of the advice they find on the web.⁴¹ Some studies have found that parents who had sought advice from the internet were less likely to consider VPDs dangerous; considered vaccines less effective, less necessary and less safe and were more likely to seek non-medical vaccination exemptions than non-internet users.^{41,42} Information that relies on acceptance of evidence-based medicine may not appeal to parents who distrust government and /or favor spiritual, experiential or emotional approaches to health decisions.⁴³ Active and often acrimonious debate between those who support and those who reject vaccination is often played out in mainstream and social media.⁴⁴

Public policy influences vaccination decisions through establishment of policy or legislative measures to promote vaccination. Common examples include recognition or removal of personal, philosophical or religious exemptions from vaccination requirements for school-entry and financial incentives. These measures aim to encourage parents to vaccinate their children through the provision of incentives to vaccinate or to make non-vaccination a less attractive or more difficult choice. The ethics, influence and effectiveness of these measures on parental decisions attracts considerable debate within the literature between vaccination proponents as well as from vaccination refusers who often liken such measures as being unduly coercive and a threat to parental autonomy and freedom of choice.^{16,25,45}

Understanding parents' decision-making processes

Immunization providers are challenged by the breadth of parental concerns and the time-pressures of service delivery.³⁵ Even when parents are seeking immunization, immunization consultations differ in significant ways from other provider-patient interactions, requiring all parties to adopt a pre-defined social role to complete the consultation successfully.⁴⁶ In searching for effective approaches to assist parents and providers, researchers have examined the vaccination decision-making environment from a variety of perspectives. These have included examination of the cognitive processes involved in assessing risk; approaches considering the interplay of broader sociological factors and analysis of vaccine decision-making through the lens of broader theories of human behavior.

Investigations considering the cognitive aspects of vaccination decision-making processes have identified a range of

mechanisms adopted by parents, including use of key heuristics (mental shortcuts) to process risk information ("risk as analysis") and to accommodate emotional influences in their decision-making ("risk as feeling").⁴⁷ Numerous authors^{34,41,43,47-49} have identified heuristics that parents may employ including omission bias (inaction due to feelings of greater responsibility from harm arising from action), anticipated regret (where parents foresee regret should their child experience an adverse event or a VPD in the future), compression bias (overestimating rare risks and underestimating common risks), protected values (zero tolerance for any risk), preference for "natural" risks and confirmation bias or "belief overkill" (only believing information that confirms pre-existing beliefs). Emotional aspects of these decisions weigh heavily on parents' minds and may dominate their decision-making.

Another focus of vaccination decision-making research has been on identifying attitudinal or decision-state groupings of parents based on behavioral or psychological factors. Researchers have offered a variety of descriptors for the decision-states that parents may experience during their decision journeys, across the continuum from full acceptance to total refusal of vaccination.^{10,30,34,49,50} These categorisations have spawned the widespread use of the term "vaccine hesitancy" to describe the heterogeneous group holding varying degrees of indecision about specific vaccines or vaccination in general. However, the term is not used consistently, lacks an accepted standard definition and is measured in a variety of non-standard ways. The WHO-SAGE Vaccine Hesitancy Working Group³⁰ has proposed a "Three C" framework of vaccine hesitancy including axes of confidence (trust in effectiveness and safety of vaccines and the systems that deliver them) and complacency (low perceived risk of VPDs). The Working Group has also included convenience (affordability and access), which more strongly relates to practical access-related issues, rather than the psychological construct of 'hesitancy' meaning 'indecision' or 'reluctance'. Betsch et al.⁴⁷ added a fourth "C" (calculating) to the WHO-SAGE framework to encompass the subjective utility maximisation that some parents use in vaccination decisions. There is consistent evidence that reducing costs, providing financial incentives and establishing vaccination requirements for child care and school entry are effective community-level interventions that increase vaccination coverage. The success of such interventions supports the assertion that parents weigh up risk and benefits, assessing the utility of their options when making decisions.⁵¹ However, conflicting information can complicate utility assessments, challenge available heuristics and may result in delayed decisions or contribute to hesitancy.⁵² Whether these considerations are already encompassed in the SAGE Working Group's axes of convenience, complacency and confidence or whether utility assessment contributes to hesitancy independently of those axes is worthy of further research. In contrast to the WHO-SAGE framework, Peretti-Watel et al.⁵³ recast vaccine hesitancy as a 2 dimensional decision-making process that reflects the interplay of an individual's adoption of modern society's risk culture or "healthism" and their trust in the authority of healthcare providers and mainstream medicine.

Other approaches have drawn heavily on social cognition models of decision-making behavior including the Health Belief Model (HBM) and the Theory of Planned Behaviour (TPB).^{30,47,54-56} While TPB interprets decisions in terms of the interplay of behavioral, normative and control beliefs, HBM explains parental decisions in terms of parents' assessments of their child's susceptibility to VPDs, the seriousness of VPDs, the safety and efficacy of vaccines and the social influence and convenience factors involved.

What are the best times to influence parents' decisions?

Each of the approaches described above enriches our appreciation of the complexity of decision-making for many parents and why the choices may appear as temporarily or permanently unresolvable to some. The literature also indicates that there may be times when parents are potentially more attentive and active in their vaccination decision making. The antenatal period is one such time.

Brunson⁵⁴ interviewed mothers and couples with young children about their vaccination decision-making experiences and found that parents began considering vaccination when they became aware of it as a factor that directly affected their child. Awareness was considered to be a factor only for first-time parents and could occur at any time: before pregnancy, during pregnancy or early in the post-natal period. In their longitudinal study of antenatal vaccination intentions and postnatal vaccination actions, Wroe et al.⁴⁹ found that 88% of women made their decision about their child's vaccination antenatally and that there was strong association ($\eta = 0.87$) between antenatal intentions and vaccination action. In their study of rotavirus vaccination intentions and action, Dubé et al.⁵⁵ found that parental intention during the antenatal or early postnatal period was the strongest predictor of rotavirus vaccination. In this study there was a 25% drop between intention and action, with the reduction associated with concerns about the rotavirus vaccine's safety, the safety of the vaccine schedule (too many vaccines) and convenience (cost) considerations. None of these 3 studies reported whether antenatal decisions were made before or during pregnancy. In their survey of 443 parents, Glanz et al.⁵⁷ found that 63.6% of acceptors (parents of fully-vaccinated children) began thinking about vaccinations before pregnancy while this was the case for 87% of those who refused and 76% of those who delayed vaccination ($p < 0.001$). In the same study, while only 19.8% of acceptors reported reviewing their decision constantly or occasionally, 68.1% and 70.7% of those who refused or delayed respectively reported reviewing their decisions ($p < 0.0001$). These findings support paying particular attention to expectant parents who are considering refusing or delaying vaccines⁵⁰ and taking opportunities to revisit these decisions with hesitant parents as their intentions (and subsequent actions) may change.

When and how to assist parents

As indicated above, there is consistent evidence that the majority of parents make vaccination decisions before and/or during pregnancy and that antenatal intentions are strongly predictive

of post-natal vaccination behaviors. However, tools to reliably identify those who are hesitant are only just starting to emerge from development and validation phases⁵⁸⁻⁶² and, when identified, there is little specific evidence on how best to assist vaccine hesitant parents to make positive vaccination decisions. Perhaps the most widely used hesitancy-seeking instrument was developed and validated by Opel et al.⁶³ The Parents Attitudes about Childhood Vaccines (PACV) survey is a relatively short hesitancy-detection tool (originally 15 items across the 3 domains of behavior, safety and efficacy and general attitudes and has subsequently been reduced to 8 items), and has been shown to be reliable in predicting vaccination behavior in US study populations. Others have focused on measuring hesitancy or confidence at different levels or for different age groups. For example, Larson et al. have developed a survey tool intended to measure contextual, individual and group factors and vaccine-specific factors for use at jurisdictional level⁵⁸ and Gilkey et al.⁶⁴ have developed and validated a Vaccination Confidence Scale for adolescents. Notwithstanding this high level of research activity, there is no widely accepted and widely used measure of parents' vaccine hesitancy.

As we have noted, influences on vaccination attitudes and behaviors can vary depending on the individual and their experiences, thinking styles and networks.⁶⁵ We have seen that parents are heavily influenced by the interplay of attitude, injunctive and descriptive social norms (what others think/say we should do and what we see others do) and perceived control over the decision. A recent systematic review of the vaccination hesitancy literature³⁰, however, found that few studies had examined the interplay of factors in the decision-making environments of parents and suggested the need for qualitative studies to improve understanding of how these factors are brought together to influence vaccination behavior. The systematic review found that most studies have been cross-sectional and concluded that, while an extensive list of multi-level factors has been identified, context is influential and affects the relative contribution of particular factors to vaccine hesitancy. A carefully constructed series of qualitative studies focused on the interplay of decision-influencing factors across different levels and settings may identify the most relevant domains and items, their interplay and their influence on vaccine decision-making within and between settings. Their relationships could be quantified using multivariate models which incorporate path analyses to estimate the influence of modeled factors associated with vaccination outcomes. For these analyses to occur there needs to be common agreement on what vaccine hesitancy is and its measurement.

As suggested by the complexity of factors involved in vaccine hesitancy, and the importance of context, there is no one-size-fits-all solution that will assist parents to make positive vaccination choices.^{10,56,65} This may explain the uncertainty about how best to present information to parents. One study found no significant improvement in intent to vaccinate after exposure to 4 commonly-employed messages intended to improve uptake.⁶⁶ In a subsequent study, however, Horne et al.⁶⁷ reported conflicting findings using similar, but not identical, messages and using different outcomes measures, concluding that emphasizing the benefits of vaccination (gained by avoiding the risks from disease) improved vaccination attitudes. On further analysis of the Horne

study data (by further segmentation of parent groupings according to vaccination attitude), Betsch et al.⁶⁸ showed that the positive effects found by Horne et al. were attributable to the hesitant or “fence-sitter” parents in the study and that these parents’ attitudes were also affected positively by dispelling myths about vaccines. These studies highlight the challenges that accompany the lack of agreed measures of vaccination constructs such as attitudes, risk perceptions, intentions and hesitancy. Validated measures of these constructs would greatly improve comparisons of interventions among like groups of parents and across standard outcome measures, improving the utility of research efforts.

Debate continues on the best way for immunization providers to communicate with parents. Several researchers have explored parent-provider conversations, seeking approaches that are more likely to result in sustained positive vaccination decisions and retain parents’ sense of control in their decision-making.^{29,69,70} Yet observational studies by Opel et al.⁷⁰ and Moss et al.⁷¹ counterintuitively found an association between a more directive communication style and vaccination or intention to comply. Such a style may have unintended consequences if the approach used undermines the parent’s trust in the provider or their sense of control in the decision in the longer term.³⁹ Indeed, a systematic review found that lower vaccine uptake was associated with parents’ perceptions that those conversations with providers were difficult, dismissive and of inadequate depth and length.³⁵ Nevertheless, studies consistently identify the importance of a provider recommendation, regardless of overall style. Motivational interviewing, a technique that has had considerable success in improving health behaviors in diverse settings,⁷² may show promise as an intervention to improve vaccination uptake but there are limited data available to recommend its adoption in vaccination settings.^{73,74} Motivational interviewing draws on the Transtheoretical Model of behavior change and may be useful in identifying where parents are in their decision journey and in tailoring interactions to guide parents through the 5 stages of the model: pre-contemplation, contemplation, preparation, action and maintenance.⁶⁹ There appears to have been little testing of the effectiveness of this technique in the field of parental vaccination decision-making however, with no published studies identified and just one small observational study identified that applied the technique to adult immunization recommendations in a community pharmacy setting.⁷⁵

Decision aids show considerable promise in assisting parents’ decision-making although there are few examples of decision aids for vaccination decisions. Wroe et al.⁷⁶ randomized 100 women attending antenatal education classes to receive either an information booklet describing benefits and risks of immunizations (50) or a standard Ministry of Health booklet (50). Participants were assessed before and after the intervention. Compared to the control group, those who received the decision-aid had significantly reduced perceptions of risks of vaccine side-effects, increased perception of risks of disease and increased satisfaction with their decisions regarding 6 childhood vaccines (polio, pertussis-diphtheria-tetanus, Haemophilus influenzae type b and hepatitis B). A series of studies have utilized online MMR (measles-mumps-rubella) vaccine decision aids. A study by Wallace et al. involved 158 people of whom 55 were parents of children under 5 y.⁷⁷ Jackson and

colleagues⁷⁸ conducted a pilot study involving 26 parents in preparation for a randomized controlled trial reported by Shourie et al.⁷⁹ and involving 220 first-time parents. Tubeuf et al.⁸⁰ performed a cost-effectiveness analysis of the decision aid used in Shourie’s RCT. These studies have shown consistently positive findings including improved attitudes toward vaccination, reduced decisional conflict, more informed decision-making and cost-effectiveness of the decision aid compared to usual practice or provision of a leaflet. However the studies have been relatively small and larger trials are needed to confirm findings. A recent Cochrane Collaboration⁸¹ review found consistent evidence that decision aids are effective in assisting people making health treatment and screening decisions, reducing decisional conflict due to feeling uninformed or feeling unclear about personal values. Despite their apparent promise and some favorable early results, progress in the development of decision aids for parents making vaccination decisions has been modest, despite the increased availability of the internet and its rapidly evolving interactivity. Progress in provision of online decision aids may be hampered by the complexity of their construction⁸² or concerns about inadvertently risking potentially negative impacts on parents’ attitudes through providing detailed information about risks.⁷⁹

Ideal approaches for providers may need to combine many ingredients: be personalized for parents depending on their current vaccination intentions; establish and build trust; provide answers to specific questions; allow parents to retain control of their decisions; allow parents to make decisions at their own pace while remaining in step with recommended vaccination schedules; and provide validated decision aids where warranted – a truly difficult recipe to achieve in a short primary care consultation.

Conclusions

Initiatives listed in publications such as the Community Guide⁵¹, in systematic^{83,84} and rapid reviews⁸⁵ and in the WHO’s “Close the Immunization Gap” campaign toolkit¹ are available for implementation. Simple initiatives such as recall and reminder systems can provide prompts for parents that vaccinations are due and remind them that vaccination is seen as important by their healthcare providers. These interactions also create opportunities for discussions with parents about their decision-making. Periodic review of coverage levels at a practice or wider geographic level can inform providers and public health agencies of the need for targeted initiatives or efforts with a wider focus as areas or population groups with low or declining coverage are identified. Cashman et al. report a successful example of using routine coverage data to target efforts to improve immunization rates, implementing a vaccination pre-call (prompting) and reminder program for Aboriginal parents and demonstrating a statistically significant reduction in the difference between vaccination coverage rates of Australian Aboriginal children and non-Aboriginal children over the 4-year life of the program.⁸⁶ Legislative measures such as the Australian Government’s ‘No Jab No Pay’ policy⁸ may provide financial incentives for some parents to vaccinate their children and increase coverage rates, but may not influence the very hesitant or those for whom the financial incentives are unimportant. Public policy initiatives

such as this deserve thorough evaluation. Undoubtedly, public health agencies and providers need to engage with vaccine-hesitant parents successfully to reach the aspirational target of having 95% of children fully vaccinated. To support this goal, research must provide a more detailed understanding of parents' attitudes, clearer guidance on the level of detail, content and framing of information about vaccine and disease risks to support positive decisions and better understanding of how parents balance those risks and benefits as they make their decisions.⁸⁷ There is need for better understanding of why some parents reject vaccination. Research that informs identification of the time during parenthood planning or in early pregnancy when parents start thinking about vaccination would support earlier intervention and allow parents and providers to take the required time to make their decisions. Perhaps most importantly, tools that reliably identify those who are hesitant and may benefit from assistance are needed to help time-stretched providers identify undecided or hesitant parents and focus their efforts with those parents to work toward positive vaccination decisions. Rigorously-tested resources are needed that better support providers in their interactions with hesitant and vaccine refusing parents. A lot of research has addressed factors associated with the convenience axis of the WHO definition (reminders, recalls, free vaccines, financial and non-financial incentives, making getting vaccinated more convenient than getting a non-medical exemption) and a lot of effort has been invested in identifying factors that affect confidence and complacency axes eg decision-making (safety concerns, social norms, risk perception, heuristics) but there is an outstanding need for interventions that effectively and reliably improve confidence.⁶⁸ Further research is needed to illuminate the interplay between the multi-layered factors within the intrapersonal, interpersonal, institutional/service delivery, community-attitudes and public health policy domains that influence parents' decisions.³⁰ Additionally better understanding of the socio-cultural factors that result in clustering of vaccine refusal is needed to inform community-level actions to reach and maintain herd immunity.⁸⁷

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No potential conflicts of interest to declare.

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Authors' contributions

PC conceived, drafted, reviewed and revised the article for intellectual content and approved the final version for publication.

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