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Identification of preliminary core outcome domains for communication about childhood vaccination: An online Delphi survey

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ABSTRACT

Background: Communication interventions for childhood vaccination are promising strategies to address vaccine hesitancy, but current research is limited by the outcomes measured. Most studies measure only vaccination-related outcomes, with minimal consideration of vaccine hesitancy-relevant intermediate outcomes. This impedes understanding of which interventions or elements are effective.
It is also unknown which outcomes are important to the range of stakeholders affected by vaccine hesitancy. Outcome selection shapes the evidence base, informing future interventions and trials, and should reflect stakeholder priorities.
Therefore, our aim was to identify which outcome domains (i.e. broad outcome categories) are most important to different stakeholders, identifying preliminary core outcome domains to inform evaluation of three common vaccination communication types: (i) communication to inform or educate, (ii) remind or recall, and (iii) enhance community ownership.
Methods: We conducted a two-stage online Delphi survey, involving four stakeholder groups: parents or community members, healthcare providers, researchers, and government or non-governmental organisation representatives. Participants rated the importance of eight outcome domains for each of the three communication types. They also rated specific outcomes within one domain ("attitudes or beliefs") and provided feedback about the survey.
Results: Collectively, stakeholder groups prioritised outcome domains differently when considering the effects of different communication types. For communication that aims to (i) inform or educate, the most important outcome domain is "knowledge or understanding"; for (ii) reminder communication, "vaccination status and behaviours"; and for (iii) community engagement communication, "community participation". All stakeholder groups rated most outcome domains as very important or critical. The highest rated specific outcome within the "attitudes or beliefs" domain was "trust".
Conclusion: This Delphi survey expands the field of core outcomes research and identifies preliminary core outcome domains for measuring the effects of communication about childhood vaccination. The findings support the argument that vaccination communication is not a single homogenous intervention – it has a range of purposes, and vaccination communication evaluators should select outcomes accordingly.

Abbreviations: COS, core outcome set (also sometimes used to refer to a core outcome domain set).

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1. Background

Effective communication with parents and communities is crucial to generating and maintaining demand for vaccines, improving global vaccination coverage and addressing vaccine hesitancy [1–7]. Communication strategies for childhood vaccination – here referred to as 'vaccination communication interventions' – operate at an interpersonal, community or population level and are delivered in many different ways, including via face-to-face interactions, print, mail/email, phone/SMS, websites, TV and radio, community events and live performances [8–14]. While varied, all vaccination communication interventions can be organised according to an identifiable number of common *purposes*: to inform or educate; remind or recall; enhance community ownership of vaccination; teach skills; provide support; facilitate decision-making or enable communication [9,14]. Organising vaccination communication interventions by purpose may aid in selection of interventions to address identified needs or problems and assists in drawing together this broad field for study [8,9,11,12].

Selection of vaccination communication interventions should ideally be evidence-informed, but it is difficult to estimate effectiveness because implemented interventions are frequently evaluated by measuring inadequate or inappropriate outcomes. A review of the outcomes measured in 112 controlled trials of vaccination communication interventions showed most trials focused solely on a limited range of endpoint outcomes, such as vaccination rates [15], a finding echoed in the final report of the World Health Organization's SAGE (Strategic Advisory Group of Experts) working group on vaccine hesitancy [16]. This is problematic because vaccination communication interventions are often complex, aiming to do more than increase vaccination rates alone (e.g. some may also aim reduce decisional conflict or increase knowledge), and they may be delivered in multi-component packages with other public health interventions. While obviously critically important, vaccination rates alone cannot tell us how a vaccination communication intervention worked, where or why it succeeded or failed, or which components were effective, essential or even harmful [17–19]. Basing decisions about intervention selection on a limited range of outcomes hampers future intervention development or tailoring and impedes building evidence [20]. For example, there is a fundamental ethical argument for ensuring that people not only adhere to vaccinations, but that their decisions are adequately informed [21]. Measuring only vaccination-related outcomes cannot reveal whether these additional goals have been realised.

This is particularly important when evaluating communication that aims to address vaccine hesitancy. Parents who are vaccine hesitant fall somewhere in the middle of the continuum between total vaccine acceptance and complete refusal [16,22]. While they may fully vaccinate their children, they may still feel some degree of reluctance or doubt about this decision, making them more susceptible to misinformation or safety scares [23]. Vaccination rates alone, therefore, give an incomplete picture of hesitancy [16,24]. To identify whether vaccination communication interventions can reduce hesitancy, additional relevant outcomes need consideration.

Vaccine hesitancy affects all stakeholders in child health – parents, healthcare providers, researchers and policymakers [16] – either personally or through the potential impacts of hesitancy on vaccination rates and public health. Internationally, different stakeholder groups are being invited by researchers to identify the outcomes of key importance for future evaluations of interventions in many other health areas such as cancer, rheumatology and oral health [25]. These activities have shown that different stakeholders may rate the importance of outcomes in different ways, reflecting their priorities [26–28]. It is not yet known if this is the case in vaccine communication. Understanding what outcomes stakeholders want to achieve or experience may be critical to designing or delivering future interventions.

1.1. Improving vaccination communication evaluation

One way to help researchers and evaluators select and measure relevant outcomes is through the development and use of a core outcome set (COS) [29,30]. A COS is a set of outcomes that stakeholders agree should be measured, at a minimum, in evaluations of a condition or intervention [31,32]. Most COSs begin by defining core outcome domains (i.e. broad categories of what should be measured). Later COS stages move towards identifying specific outcomes within these domains and may also establish measurement methods [33].

In this paper, we describe the identification of preliminary sets of core outcome domains for vaccination communication, the first stage of COS development. A recent study has used COS-related methods to identify 'core values' for the evaluation of vaccines themselves [20], but we are not aware of any comparable research into the types of outcomes that could be measured in vaccination communication evaluations.

Because this field is uncharted, our approach was broad. We focused on three common types of vaccination communication interventions with potential to address vaccine hesitancy [34], defined by their purposes: (i) communication to inform or educate, (ii) to remind or recall, or (iii) to enhance community ownership [9]. Using an online Delphi survey, we asked different stakeholders to rate the importance of outcome domains that could be measured for each communication type. Delphi surveys are commonly used for outcome prioritisation related to health conditions [25,26], but the method is largely untested for prioritising communication outcomes. This study gave us the opportunity to examine the Delphi survey's feasibility in the context of vaccination communication.

This study is the third and final stage in a larger project about outcomes for vaccination communication [35]. Findings have been reported on the outcomes measured in trials [15] and the comprehensive range of specific outcomes that could be measured within each outcome domain [36].

2. Aims

Our aims were:

(1) To identify outcome domains that are most important to stakeholders when measuring the effects of different vaccination communication types.
(2) To explore which specific outcomes within one outcome domain ("attitudes or beliefs") are most important to stakeholders.
(3) To identify and describe patterns in stakeholder responses relevant to future outcomes research.
(4) To collect feedback on the applicability and acceptability of the Delphi survey format to prioritise outcome domains for communication interventions.

3. Methods

We used a Delphi survey to identify stakeholder-relevant outcome domains for three common types of vaccination communication. In Delphi surveys, anonymous participants with relevant expertise answer two or more sequential surveys to identify con-

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