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Media researchers must understand the audience too.

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The impact of the media is undeniable. Its capacity to influence confidence in vaccination is no exception. There are stark examples of where mass media amplification of unsubstantiated claims about vaccines has led to a downturn in vaccination coverage. The mass media played a crucial role in responses to Italy's temporary suspension of an influenza vaccine, the United Kingdom's measles-mumps-rubella (MMR) scare, Nigeria's polio vaccine boycott, the United States' thimerosal concerns, and Japan's suspending of proactive human papillomavirus (HPV) vaccine recommendations for female adolescents. Now, social media gives an unprecedented capacity to spread misinformation about vaccines. A single rumour can spread rapidly before it can be refuted, leaving clinicians and health officials struggling to know where or when to respond.

Viewed through this bleak lens, it would be easy to assume that vaccination rates are declining in many countries caused by this increased exposure to misinformation, which in turn causes a parent to not vaccinate. But the data don't bear out this simple linear relationship. There are instances where countries emerge unscathed from a mass mediated safety scare. In Australia for example, the introduction of the HPV vaccine program in adolescent females saw widespread publicity surrounding adverse events in two schools later thought to be a mass psychogenic illness event. The program withstood the media attention and Australia rapidly reached high levels of three dose uptake. (1)

Even with the UK's autism and vaccination scare, MMR coverage for children took four years to decline from the 91% prior to publication of the original paper to 2003-04 when coverage hit a trough of 80%. A range of factors amplified its effect with the media's role being one, albeit important one.

Audience studies provide further explanation for this non-linear effect. When exposing mothers of infants to negative media messages about vaccination, our research found that most mothers actively wrestled with them.(2) Their resilient beliefs in vaccination were reinforced by recourse to their wish to protect their children from feared infectious diseases. Anti-vaccination rhetoric contained in the media prompts was most potent when it came from medical sources and/or included stories and images of allegedly vaccine-damaged children. To reassure

themselves and each other, mothers recalled images and stories of children affected by vaccine preventable diseases. They also spoke of their relationships with health professionals, the advice of family and friends, and scepticism about the media as a source of information.

These audience-centred contextual methods ask not, “What do messages do to people?” but “What do people do to messages?” preferably in natural settings where such messages are normally consumed. Hall described three possible readings of a media message: the dominant or preferred reading where the reader of a message readily accepts the intended message in the spirit in which it was communicated; the negotiated reading, where the reader qualifies the message via competing values or considerations; and the oppositional reading, where the reader completely rejects the intended message.(3) The propensity for such interpretations lies with an individual’s existing beliefs, attitudes and practices and also their social and cultural context.

What does this mean for vaccination? As Signorelli and Odone indicate, media monitoring can document the prevalence, placement, and characteristics of media messages about vaccination. Audience research can help to understand the range of possible meanings that people take to their readings so agencies can determine if and how to respond.

How can audience research be done effectively? Many would view the gold standard of audience reception testing as requiring experimental conditions to randomise key media messages and messengers with the primary outcome being vaccine confidence and uptake. Interaction terms can examine the factors that lead to Hall’s dominant, negotiated and oppositional readings. But often interpretations are highly contextualised. Qualitative studies such as the focus groups noted above enable researchers to identify the responses and shared meanings that groups bring to their interpretations. In social media, big data mining is enabling researchers to identify both message content and influence at once. Researchers can now teach computers natural language processing that can identify vaccination sentiment with high levels of accuracy and then follow the way it is shared among users.(4)

Frequently, media messages about vaccine safety arise with minimal warning, such as when there is an adverse event signal, and authorities lack time, resources or capacity for in-depth primary analyses. But since some messages have a greater impact on behaviour than others, there is scope for media monitoring itself to identify characteristics likely to influence vaccine confidence and behaviour. Socio-cultural analyses and psychological studies of risk perception provide a rich body of knowledge, some of which has been encapsulated in Sandman’s model of risk response: Risk = Hazard + Outrage.(5) Here, risk is both based on objectively quantified hazard plus the outrage it is capable of causing. Applied to media analyses, a story is more likely to gain traction if the purported vaccine reaction arouses a particular form of dread (e.g., auto immune disease) with victims who are easily identifiable (e.g., a daughter who became unwell after an HPV vaccine) and where there is debate among those perceived to be experts (e.g., a doctor who questions the vaccine’s

necessity and safety pitted against other experts). Stories with such characteristics are likely to be more capable of lingering in the media and the minds of audiences and after sufficient exposure, to harm public confidence. Once this occurs, it can take many years to recover. This is why timely responses are essential.

In conclusion, the utility in analysing media messages is in describing the information available to publics. This allows public health practitioners to see what could potentially influence vaccination-related behaviours and is crucial. However, the picture is not complete without some a consideration of what people do to these messages when they incorporate them into their contexts, meanings and experiences. This allows responses to be more informed by evidence, more strategic and targeted to potentially affected audiences.

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