Impact of antivaccination campaigns on health worldwide: lessons for Australia and the global community

The arrival of social media coincides with the point at which the antivaccination movement became globally coordinated

The antivaccination movement has roots in the first vaccine, smallpox, although opposition to the practice of artificially inducing immunity reaches back to the practice of variolation. Despite over two centuries of vaccination practice and all the advances in medical science and societal changes that have occurred over this time, the objections still follow the same themes. These have been eloquently described as: vaccines cause idiopathic illness, unholy alliance for profit, vaccines as poisonous chemical cocktails, cover-up, towards totalitarianism, vaccine immunity is temporary, vaccines are ineffective, and health lifestyle alternative.[1] For over two centuries, antivaccination activities, distribution of literature, membership and scientific establishment responses remained unchanged.[2]

While the internet emerged in the 1960s, the idea of "surfing", the first audio and video distributions, and real expansion of the number of websites and browsers, including Google, increased dramatically during the 1990s, and it became common for organisations and individuals to have a website and an email.[3] For the first time, groups opposing immunisation could make literature widely available. This facilitated the sharing of ideas into the global arena, and people searching for information about vaccination could easily find material that was critical. However, this was not enough to fuel a global movement of significance.

Social media arrived in the early 2000s, with Facebook going online in 2004 and reaching 400 million active users by 2010.[4] This point in time approximates the dawn of a new era in the antivaccination movement. It coincides with the point at which the movement became globally coordinated through social media platforms, most notably at the time the human papillomavirus (HPV) vaccine became widely available.[5] Today, unlike traditional media, the microtargeting algorithms on Facebook allow these antivaccination groups to target parents of young children, women in particular.[6,7]

Together, these multifaceted activities have had a profound impact on global vaccine confidence,[8–10] so much so that, in 2019, the World Health Organization included vaccine hesitancy (ie, delay in acceptance or refusal of vaccines despite availability of vaccination services) as one of ten threats to public health,[11] and in 2020, this was included again within the spread of misinformation.[12]

Impact of antivaccination activity

While we have seen the impact of antivaccination activities on vaccine uptake through the ages, it has never had such a global reach or spread. Learning from cases where vaccine scares have affected coverage, and how programs can recover from these experiences, provides valuable lessons. It can be difficult to directly attribute changes in immunisation coverage to vaccine hesitancy and social media activities and the impact will likely vary by setting. It is important to remember that no matter what is happening in the social media realm, currently, over 90% of children in most high income countries including Australia and New Zealand continue to be fully immunised, most in a timely way. So how much does this matter?

Vaccine hesitancy affects over 90% of countries, for dynamic reasons.[13] Non-vaccinated people tend to cluster and not distribute evenly across the community. Clusters occur in schools, areas of deprivation, and some areas of privilege. This means that there are communities that do not have herd immunity despite a high overall population immunisation uptake. Geographic clustering of low vaccine coverage has been demonstrated to contribute to outbreaks, and modelling indicates even modest reductions in measles–mumps–rubella (MMR) vaccination coverage will likely result in larger and more frequent outbreaks of measles.[14]

Clinical consequences: two cases

Japan and HPV infection

Japan made HPV vaccines available in 2009 and funded from 2010. Uptake was swift and reached 70%. In 2013, reports of side effects including muscle pain, sleep disorders, and light and sound sensitivity began to appear. These reports were not validated through empirical assessment. Instead, antivaccination advocates encouraged individuals who were unwell to come forward.[15] The Japanese government decided to stop recommending the HPV vaccine in 2013 and uptake fell to less than 1%. Despite the Vaccine Adverse Reactions Review Committee concluding that there was no evidence to suggest a causal association between the HPV vaccine and the reported adverse events, the government did not reinstate its recommendation.[15] As a consequence, there are a projected 24 600 cases of cervical cancer in Japan, which could have been prevented had the HPV vaccination program not been interrupted, and a projected 9000–10 800 preventable deaths over the next 50 years.[9] While HPV vaccine is funded on the National Immunisation Program in Japan it is not proactively recommended. Modelling shows resumption of the program could prevent most of these cases.[9]

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Samoa and measles

Samoa has a long history of low immunisation coverage, with per annum rates often under 50%.[16] On 6 July 2018, two infants were administered the MMR vaccine from a multidose vial that had been reconstituted with a muscle relaxant instead of water. Tragically, both infants died within minutes. The cause of the deaths was established quickly through appropriate investigation, and communication guidance was provided from the WHO but never used. The government halted the entire immunisation program for several months and neither the public nor the health professionals were informed that it was not the vaccine that caused the deaths. Two nurses were charged with manslaughter and judicial proceedings ensued over the following months. Soon after the sentinel event, the Samoan social media were dominated by messaging from antivaccine influencers from Australia, the United States and New Zealand.[17]

The immunisation program was progressively reinstated, with MMR vaccination commencing again in November 2018. In September 2019, measles was introduced to the Samoan population from New Zealand. By the time the epidemic ended, there had been almost 5700 cases reported and 83 people had died, most were children aged under 5 years. Throughout most of this tragedy, local influencers used social media to encourage parents to seek traditional healers for measles, resulting in the arrest of one influencer.[18] Often, by the time patients arrived at the hospital, it was too late to save their lives. A lack of understanding about preventive health care and the nature of infectious diseases coupled with lack of access to health care left people vulnerable to misinformation.[19]

Approaches: the national level

The uncertainty associated with vaccine hesitancy has been described as a "wicked problem" in risk communication in that it is hard to define.[20] To better understand the communication crisis, when vaccine safety scares (real or perceived) occurred, the WHO Global Advisory Committee on Vaccine Safety assigned a subcommittee to map the vaccine safety communication activities across the vaccine life cycle using case studies. Events resulting in loss of vaccine confidence and declines in vaccine uptake occurred in low, middle and high income countries across time with different triggers, including antivaccination activities. Despite the diversity in settings and circumstances, in seven cases examined, crises were averted or fuelled according to activities in four critical steps taken (or not) by health authorities. Insufficient action in one or more areas resulted in a negative impact on vaccine uptake. In contrast, damaged programs were retrieved through appropriate actions.[8]

Ireland and Denmark: HPV vaccination

Ireland and Denmark implemented HPV vaccination programs and uptake was high.[10,21] However, both countries experienced extensive antivaccination activities that emerged from grassroots movements that recruited cases where families believed their child was injured by the vaccine. In both countries, health authorities were slow to recognise the potential impact these movements would have on coverage, and it was not until uptake had declined dramatically that action was taken. Retrieving vaccine confidence and the coverage involved coordinated, proactive, multifaceted communication campaigns that recruited cross-sectorial support and key influencers; used a variety of media, particularly social media; and monitored public opinion to inform the interventions. Importantly, the monitoring of public opinion continues.[10]

Approaches: the health professional level

Timely immunisation is a priority for primary health care providers, and they are usually at the front line when it comes to responding to client questions and concerns around immunisation. Research consistently finds that people who have a warm trusting relationship with a confident and knowledgeable health provider are more likely to vaccinate themselves and their children.[22–24] However, with the rise in prominence of social media activities that question the value of vaccines and downplay the risks of vaccine-preventable diseases, it is vital that vaccinators keep up to date with current memes and themes and are able to respond confidently and effectively to the questions that arise (Supporting information). When education and resources for these professionals are not accessible and funded, then working with vaccine-hesitant people is challenging and stressful. Providers could use social media and their own websites to craft and promote positive immunisation messages for their community. Posting messages that support patient and parental confidence in the safety and effectiveness of vaccines, and raising awareness that most infants are fully immunised, helps embed immunisation as normal health behaviour.[25] Evidence also supports the use of personal stories and anecdotes that resonate with vaccine-hesitant parents;[6] infographics can help bypass anecdotes.[26]

Conclusion

Counteracting health misinformation is the responsibility of everyone, from medical journals to social media executives, health professionals and the general public. There is no one-size-fits-all in this space; solutions at times appear uncertain. Recognising the complexity of this problem is the first step, and maintaining trust in health professionals, health ministries, government, global and professional health bodies and scientists is essential.

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Supporting Information

Additional Supporting information is included with the online version of this article.

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