

Herd Immunity or Heard Not of Immunity?

Anis Siham Zainal Abidin, Masri Mohamed, Mazidah Nordin, Nor Azizah Abu, Noor Shafina Mohd Noor, Faisal Mohd Fadzli, Mohammed Fauzi Abdul Rani

Faculty of Medicine, Universiti Teknologi MARA (UiTM), Selangor, Malaysia

INTRODUCTION

The Lancet published this early report by Andrew Wakefield et al on February 28th, 1998; “12 children (mean age 6 years [range 3–10], 11 boys) were referred to a paediatric gastroenterology unit with history of normal development followed by loss of acquired skills, including language, together with diarrhoea and abdominal pain.... Onset of behavioural symptoms was associated, by the parents, with measles, mumps, and rubella vaccination in eight of the 12 children” [1].

This article flipped the concrete evidence-based success story of vaccination into an emotionally charged and debatable topic of the century. It was only after a decade of much larger studies which failed to replicate their findings that it became evident that there was no association between Measles, Mumps and Rubella (MMR) vaccination and autism. While it is well known that scientific investigations can be wrong but what is unacceptable here is the fraudulent research practice, in this case, the presentation of wrong data, and the lead author’s overwhelming undeclared conflict of interest. The aftermath could not be more devastating, Lancet withdrew the paper fully and the loss of his license to practice medicine in the UK in 2010.

THE WIDER IMPLICATION

The MMR-Autism link saga to the medical world meant that more research, time and money were poured to refute the study and also to expose the fraud but the repercussions however were not only confined to the medical profession. The greatest damage was the appalling tangential increase in vaccine refusal among parents worldwide which fuelled the measles outbreak

across the United Kingdom (UK), United States and Canada in the year 2008 and 2009. UK for example, saw a drop in vaccination rates from 87.4 percent to 79.9 percent in the year 2000-01 and 2003-04 respectively and not surprisingly, a dramatic increase in measles cases in the UK in the year 2007-08, which was equal to the combined total measles notifications for the past decade [2].

As the news coverage on the controversy intensified, and coupled with advancement of technology in the social media network, the public perception on vaccination has suddenly changed, the most successful health revolution in the 20th century is now at stake. Seemingly increasing public distrust and confusion over the safety of vaccination were echoed and mischievously elaborated geographically, reaching out to most of the third world countries including Malaysia causing the dreaded domino effect of declining immunisation rates in many countries including our own.

THE BLIGHT ON OUR SUCCESS

We began our free national immunisation programme for Diphtheria, Pertussis and Tetanus in 1958, the vaccination for Tuberculosis, Polio and Measles were gradually added into the immunization schedule between the years 1960 to 1980s. Malaysia has done very well since, based on the latest Millenium Development Goal (MDG) report in 2015, we have reached almost full coverage for one-year-old intake of the Measles, Mumps and Rubella (MMR) vaccine. The rate of intake of this vaccine was initially 70.1% in 1990, with massive improvement to 94.3% (2008) and 95.2% in 2013 [19], validated by a recent study in 2016 from a rural clinic in Sabah at 98.5% [29].

Lurking behind this success however is the rising trend of parents refusing to vaccinate their children. We now notice an increase in the number of vaccine refusal from 470 cases in 2013 to 648 in the following year and 1292 in 2015. Among the states in Malaysia, Kedah state recorded the highest number of vaccine rejection cases with steady rise from 239 cases in 2014 to 318 cases a year later.

Why is this happening? Data from the state of Kedah health statistics suggested that the major cause for the refusal was the concern regarding the vaccine contents and their religious permissibility (*halal*). This is supported by a cross-sectional study in 2013 done in Perak that showed the main reasons for parental immunisation refusal were preference to alternative treatment (75%), assumption that vaccines have no effect (37.5%) and apprehension on the vaccine contents (25%), other reasons included not being informed regarding vaccination from health practitioners, information from family members and media, religious influence, personal belief and long waiting time in the clinic [18]. In this study the refusal rate was 8 per 10,000 children per year and immunisation defaulter rate was 30 in 10,000 children per year. Vaccine refusal could also be caused by deferral which could be due to either ill infants or parents missing the schedule or appointments [17].

The number of vaccine preventable diseases has also showed steady increment for the past few years, in tandem with the decrement of immunisation rates. Measles cases in Malaysia has quadrupled from 195 cases in 2013 (6.6 cases per million population) to 794 cases up till September 2016 (34.7 per million population). This is certainly a blight on our success and it pushes us off track from the MDG target of global measles elimination by 2015.

APPREHENSION OF VACCINE CONTENT

Certain chemicals are present as ingredients in the vaccines to ensure safety and effectiveness of the final products. These substances naturally exist in the environment and only become toxic if they reach or exceed a certain threshold.

Among chemicals used in vaccine preparation include thimerosal (mercury), which is an organic compound containing ethylmercury. Its primary role is

to prevent bacterial and fungal contamination and has been used as vaccine preservative since 1930's [30].

Virtually all vaccines are now mercury-free; and even if present its potential harmful effect is almost negligible as the chemical content in the vaccine is extremely low.

Aluminium is another compound used in vaccine preparation. It acts as an adjuvant to enhance the immune response to the vaccine antigen [30]. Exposure to aluminium from vaccines is well below the current minimum risk level of 2.0 mg/kg per day [30]. Interestingly, the content of aluminium is higher in breast milk compared to vaccines [31] as well in certain medications such as antacids [31].

However, another reason of apprehension that is being used as bone of contention by anti-vaccination campaigners is the permissibility (*halal*) of the vaccine contents.

THE ISLAMIC VIEWPOINT

The objectives of Islamic law (*maqasid shariah*) are the preservation of five fundamental elements in a person; religion, life, lineage, intellect and property. Correspondingly, the maxim of Islamic law (*Qawaid al Fiqh*) adheres to the principle of avoiding harm, thus taking steps towards maintenance of health and this includes vaccine administrations to prevent serious and life-threatening illnesses among children are in accordance to these principles.

As stated earlier, the main religious consternation regarding vaccination among Muslims parents revolves around the issue of permissibility (*halal*) of the vaccine contents. In this regard, many scholars in Islamic Jurisprudence have in fact issued clear ruling (fatwa) regarding the permissibility of most vaccines used as part of national immunisation programmes worldwide, including Bacillus Calmette-Guerin (BCG), Hepatitis B, Diphtheria, Tetanus, Pertussis and Rubella vaccines [20-24].

Differences of opinion however does exist among the scholars regarding vaccines that have substances derived from pork, which are forbidden (*haram*) in Islam, being used during their manufacturing process. As an example, for the production of oral polio and rotavirus vaccines, trypsin enzyme of porcine origin is used during production to

dissociate the virus from cultured cells, but it is later removed through the process of microfiltration. The use of this substance however has led the Malaysian Fatwa Committee National Council of Islamic Religious Affairs in 2008 to issue a ruling that the use of Rotavirus vaccine is forbidden, other religious considerations by the council include the availability of an alternative trypsin source and the absence of an urgent state (*darurah*) for its use. But other opinion does exist which can be considered to be more in tune with the spirit of Islam that discourages complexity in performance of religious duties, the ruling from the European Council of Fatwa & Research in 2003 led by Yusuf al-Qardhawi. He concluded that the use of oral polio vaccine was permissible based on the following reasons; the negligible amount of trypsin used in the vaccine preparation, the fact that trypsin is filtered and thus not detectable in the final vaccine, and finally what is forbidden (*haram*) is made permissible in the state of necessity. As a result of this ruling, many Muslim countries such as Saudi Arabia, Bahrain, Yemen, Qatar, Iraq, Morocco, Sudan and Pakistan [20] have incorporated Rotavirus vaccine that uses porcine trypsin in their national immunisation programmes.

THE WAY FORWARD

This requires efforts by all relevant stakeholders, government and non-government, to reverse the trend we see locally as well as worldwide. One great stride forward was the WHO approved Global Vaccine Action Plan, a framework to prevent millions of deaths by 2020 through more equitable access to existing vaccines for all peoples in all communities [30]. The aims here are to strengthen routine immunisation to meet vaccination coverage target, accelerate control of vaccine-preventable diseases as well spur research for development of new and improved vaccines [30].

Healthcare providers are undoubtedly the front liners in educating the parents and clarifying any doubts which may prohibit vaccine adherence among them. We know that counseling parents with clear information about the risks and benefits of vaccines, and taking advantage of clinical consultation visits for explanation of immunisation are among the most effective strategies suggested to achieve this [31]. In Malaysia, forums and educational talks to the general

public are actively organised by the Malaysian Ministry of Health and other non-governmental organisations to reach for these parents at all levels and localities. Besides that, social media is also very effective and is a borderless educational platform to reach the community.

Finally, the history of vaccination had been a great success story of the last century, Measles vaccination alone has been estimated to have helped save 17.1 million lives in the year 2000 [27]. Lack of knowledge on the issue compounded with contradictory information in social media have led to the disruption of herd immunity that previously had been the gate keeper in protecting our children from vaccine-preventable disease. We must do all we can to ensure it remains a success.

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