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Strategies for Correcting Misinformation about Vaccination and Increasing Coverage: Relevance for Health Education

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ABSTRACT

Vaccination continues to be one of the most important mechanisms for the prevention of diseases in public health worldwide. The introduction of vaccination programmes has resulted in an increase in life expectancy in the world, which is one of humanity's greatest achievements. According to the WHO, vaccination could prevent between 2 and 3 million deaths per year worldwide. That notwithstanding, misinformation about vaccines is on the ascendency, leading to vaccination hesitancy globally. This review article aims to correct the misinformation leading to vaccination hesitancy and suggest strategies to improve vaccination in various countries. The information in this article could then be used for public health education on the need to accept vaccines to prevent diseases.

Keywords: Strategies, Misinformation, Vaccination, Increasing Coverage, and Health Education.

INTRODUCTION

Vaccination is a crucial mechanism for the prevention of diseases in public health. The advent of vaccination programmes has improved life expectancy significantly in the world and is one of humanity's greatest success stories in health. Vaccination is significant to primary health care, an incontrovertible human right, and one of the greatest health investments money can buy(1). Vaccination is a global health success story, saving millions of lives every year. Vaccination can prevent between 2 and 3 million deaths per year worldwide. Currently, there are vaccines to prevent more than 30 life-threatening diseases and infections. At the moment, many countries are facing the return of some epidemics believed to be eradicated, the re-emergence of which is mainly due to a lack of vaccination coverage. (World Health Organization (WHO), 2025).

At the moment, many countries are facing the return of some epidemics believed to have elapsed, the reappearance of which is mainly due to a lack of vaccination coverage. In an increasingly digitalized and introverted society, misinformation is on the rise, and social media

pose a new challenge when it comes to maintaining confidence in immunization, leading to vaccination hesitancy.

IMMUNIZATION AND VACCINATION

As we discuss vaccination, it is essential to clarify the distinction between the two medical terms, immunization and vaccination, as they are often used interchangeably.

Immunization: The method of acquiring immunity to a disease, which is the body's natural ability to resist or overcome a disease. This can be achieved through Vaccination, natural infection, or pre-made antibodies, such as the administration of vaccines that contain antibodies(2).

Vaccination is the administration of vaccines to **stimulate the immune system** to develop antibodies in order to protect the body against disease. Vaccines are typically prepared with **weakened, inactivated, or parts (antigens)** of the disease-causing organism, which **trigger an immune response without causing illness**, enabling the body to develop immunity and reducing the likelihood of certain diseases upon future exposure(3). Importantly, vaccines promote the development of **memory B cells and T cells**, which allow the immune system to react more quickly and effectively when encountering the pathogen again(3). Vaccines can be administered in various ways—such as by **injection, oral drops, or ingestion**—depending on the type and target disease (4).

Figure 1: a picture indicating an example of a vaccine vail.

Figure 2: a picture indicating administration of a vaccine.

ACTIONS OF VACCINES IN THE BODY

Vaccines contain weakened or inactive parts of a specific pathogen (antigen) that activates an immune response within the body to produce antibodies. Other vaccines contain weakened or

reconstituted virus or bacteria as a whole. Newer vaccines contain the blueprint for producing antigens (DNA or RNA) rather than the antigen itself. Irrespective of whether the vaccine is made up of the antigen itself or the blueprint so that the body will produce the antigen, this weakened form will not cause the disease, in the person receiving the vaccine. It would rather stimulate their immune system to respond by producing antibodies much as it would have on its first reaction to the actual pathogen. The immune system subsequently, develops a long-lived lymphocyte (memory cells) that remember the pathogen, so if the body is exposed to it again, it can rapidly organise to fight it away. Vaccination has proved to be a safe and effective means of preventing some contagious diseases. It protects individuals from serious illnesses and complications, and it also helps to reduce the spread of epidemic and pandemics.

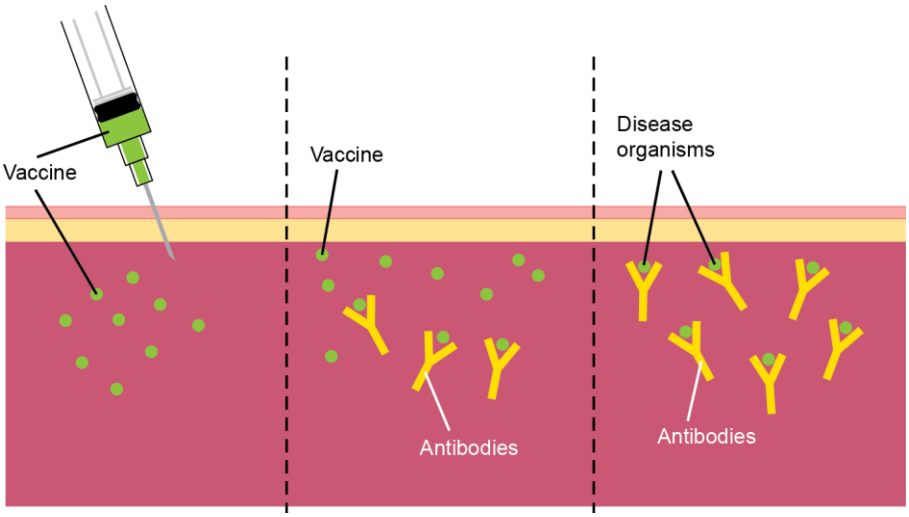

Figure 3: Diagram indicating actions of vaccines in the body

ACHIEVEMENT OF VACCINATION IN PUBLIC HEALTH

The achievement of Vaccination in public health cannot be overemphasized as childhood vaccination alone continue to prevent about four million deaths in the globe annually Marco, 2022). Vaccination programmes have transformed control of diseases, moving the direction for human health by ensuring protection against about 30 specific infectious diseases worldwide (WHO, 2024). Vaccination currently prevents 3.5 million to 5 million mortality annually from diseases such as diphtheria, tetanus, pertussis influenza and measles. A recent study conducted by John et al, 2025 reveals through their comparative effectiveness study found that COVID-19 vaccinations averted 2.5 million deaths during 2020-2024 (sensitivity range estimates, 1.4-4.0 million) and saved 15 million life-years (sensitivity range estimates, 7-24 million life-years). The estimated benefits had a steep age gradient.(5)

Vaccination programs have contributed to ending the spread of extremely infectious diseases that could cause epidemics, such as smallpox, which was eradicated around 1980. This success story was achieved through a decade of deliberate worldwide vaccination campaign by the World Health Organization (WHO)(6). The introduction of vaccines has facilitated a reduction in the number of critical morbidities, hospitalizations, and mortality. The swift response to the epidemic showed that vaccines could be the most effective in containing new diseases and preventing them from becoming full-scale pandemics(7).

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The contribution of vaccination to the theory of herd immunity or population immunity is a very significant aspect of controlling epidemics and pandemics. It occurs when a sufficient portion of the population becomes immune to a disease either through vaccination or previous infection. When enough people are immune as a result of vaccination, the disease finds it harder to spread even among those who are not vaccinated, such as people with certain medical conditions.

Vaccine Hesitancy

Notwithstanding the enormous achievement of vaccination in public health as explained above, Vaccination hesitancy continues to increase globally. This has been identified by the World Health Organization (WHO) as one of the top 10 threats to global health. In 2023, the routine first dose of measles vaccine was missed by 22 million children, which is far above the 2019 level of 19.3 million children who missed the vaccination, indicating a decline in interest in vaccination. Vaccine hesitancy could be explained as the delay in acceptance or rejection of vaccines despite the availability of vaccination services. It's a complex issue that varies across time, place, and even by vaccine. Many factors could contribute to Vaccine Hesitancy, however, misinformation or myths may play a significant role in some people delaying or refusing vaccination. This significantly influences public perception and contributes to vaccine hesitancy in many countries across the globe. The misinformation or myths is a phenomenon characterized by the spread of false or misleading information about vaccines. That often leads to unwarranted fears and doubts about their safety, efficacy, and necessity (European Society of Medicine, 2024). This misinformation has become so widespread due to vibrate mass and social media in recent times.

Vaccine Misinformation in Europe

There are a lot of misinformation or myths that spread in many countries in Europe. This include the fact that vaccines can cause the disease they are meant to prevent. This means that people have the notion that vaccine can cause a disease that a particular vaccine is supposed to prevent. Another misinformation is also explained that, vaccines aren't necessary because disease rates are already low and therefore there is no need to accept vaccine that may cause another disease. Again people believe that, Natural immunity, acquired by contracting a disease, is superior to vaccine-induced immunity hence no need for vaccine administration. Another serious misinformation about vaccines has do with the view that, vaccines cause autism (brain development that impacts how a person perceives and socializes with others)(8). As a result some parents in Europe refuse childhood vaccines for their babies. The COVID-19 vaccine also had it fair share of this phenomenon of misinformation. As it was believed that, COVID-19 vaccine contains a chip that will track individuals, stop them from travelling. Again, news spread out that it will make people infertile and is an attempt to reduce the population (Black, Asian and minority ethnic) communities. In addition, there was a perception that Black, Asian and minority ethnic- BAME people are being used as ‘guinea pigs’ to test out the COVID-19 vaccine. The COVID-19 vaccine has been developed and approved too quickly and has not been fully tested, therefore not safe. The COVID-19 vaccine will negatively disrupt your natural immune system. Herbal remedies will be more effective than the COVID-19 vaccine (9).

Vaccine Misinformation in Asia

Vaccine misinformation in Asia is rampant and mirrors trends seen in other regions (8). In many countries, persistent myths suggest that vaccines are inherently toxic and could cause

fatalities—a narrative amplified by emotionally charged misinformation(10). Another widespread belief is that vaccines—such as the polio vaccine—can make children ill after administration, leading to the perception that they are unsafe; these fears are often driven by misinterpretation of rare adverse events and amplified by misinformation networks (8). Moreover, some parents worry that multiple vaccines given concurrently might "overload" or weaken a child's immune system, a notion contradicted by immunological evidence showing that infants safely manage high antigen loads(11).

Vaccination Misinformation in the United States of America

In the United States, vaccine misinformation persists strongly—one prevalent myth is that a child's immune system can be "overloaded" by multiple vaccines administered at once(11). Another common misconception is belief in "disappeared diseases," where individuals assume that illnesses eradicated through vaccination, like measles or smallpox, are no longer a threat and therefore no longer warrant protection (12). Additionally, the notion that "more vaccinated people get sick than unvaccinated people" during outbreaks stems from misunderstanding incidence statistics—not vaccine ineffectiveness. Some attribute the decline in infectious diseases to improved hygiene and nutrition rather than vaccination, overestimating the effectiveness of "natural immunity" and undervaluing vaccine-acquired protection (13).

Vaccine Misinformation in Africa

In Africa, one of the most pervasive pieces of vaccine misinformation stems from historical mistrust—particularly the belief that Africans are used as subjects for unethical medical testing (14). Another widespread conspiracy posits that vaccines are tools to kill Africans, facilitating Western exploitation of the continent's natural resources(15). Similarly, the myth that COVID-19 vaccines cause infertility has spread rapidly, despite no scientific backing and active debunking by medical authorities (14). Survey and social media research in Sub-Saharan Africa reveal that these fertility concerns are a significant driver of COVID-19 vaccine hesitancy, especially among women of reproductive age (16). While there are anecdotal rumors—such as the claim from Ghana that a police officer became "magnetic" post-vaccination—the lack of credible evidence suggests these remain isolated myths with limited formal reporting.

Figure 4: a picture indicating a police officer claiming his body turned to magnet after taking COVID 19 vaccination.

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STRATEGIES TO IMPROVE VACCINATION COVERAGE

Vaccine Education Campaigns

These targeted strategies provide public education, which can be tailored to specific concerns, for example, childhood and COVID-19 vaccine safety information. The education should also emphasis on explanation of immunization, vaccination, mechanism of actions of vaccines and benefits of vaccines to prevent diseases. The use of multimedia campaigns such as radio, television, social media and written platforms could be adapted into suitable languages depending on the target(17).

Effective Communication Strategy

This Strategy needs to provide balanced and clear information to generate greater public confidence. It should be delivered by experts in health and vaccination such as scientific, clinical authorities and public health experts. Communication associate with a certain political parties and religious explanations should strongly discouraged(18).

Ensuring Suitable Environment

This strategy requires critical engagement from the government, civil society, faith leaders and the media. By ensuring an efficient vaccination roll-out strategy, positive public sentiment is maximised. For example, vaccination could be offered in the evenings or on weekends, and vaccination sites, such as places of worship, can offer a sense of familiarity in communities that are distrustful of the government(19). Transportation services provided to communities that are far from vaccination sites may offer a solution to people who may not have considered vaccination as an option. In addition, easily accessible online material for vaccine recipients and healthcare workers will help create positive user feedback and strengthen the vaccination program.

Adoption of Social Media by Vaccine Experts

This strategy suggests the use of social media as a means for health education on vaccination. It is expected that health expert in vaccination adopt some social media platforms to propagate the importance of vaccine in the prevention of diseases. In addition to the health expert could use social media to correct misinformation about vaccines to improve vaccination coverage. The social can therefore be use to educate, promote healthy behaviors, and facilitate communication between individuals and healthcare professionals on vaccination(20).

Enactment of Laws to Increase Vaccination Coverage

The strategy proposes the enactment of laws by states to enforce vaccination programmes to prevent people from rejecting or refusing vaccines. The various states can take a clue from United State of America where a citizen refuse to take smallpox vaccine in Massachusetts in case where “Individual versus public health priorities were first argued in the U.S. Supreme Court more than 100 years ago. In Jacobson versus Massachusetts, a Cambridge resident refused to be vaccinated for smallpox, because he believed the law violated his right to care for his own body for he knew best care it. The Court rejected Jacobson’s challenge. This influential 1905 ruling has served as the foundation for state actions to limit individual liberties to protect the public’s health” (21). It therefore suggests that countries could use this historic landmark case to enact laws to enforce vaccination programmes to protect the larger public interest instead of individuals’ whims and caprices.

CONCLUSION

Vaccination is most potent and basic instrument for primary prevention of diseases in public health to ensure a healthy population, productivity and long life expectancy. However, there are a lot of vaccination hesitancy across the globe due to misinformation and myths spread by some people through the mass media. It is therefore important to adopt the following strategies; Vaccine education Campaigns, Effective Communication Strategy, ensuring suitable Environment, Adoption of Social Media by Vaccine Experts and Enactment of Laws to Increase Vaccination Coverage. It is believed that if the aforementioned strategies are effectively and efficiently implemented, it would go a long way to increase vaccination coverage to control future epidemics and pandemics and reduce it impact in the human race even if they even do occur.

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