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The Incidence Of Vaccine Hesitancy And Its Impact On Disease Outbreaks

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Abstract

Analyze the variables that contribute to either the reluctance or willingness to adopt vaccines in the context of pandemics, significant epidemics, and worldwide outbreaks. This is a comprehensive study and analysis of 28 articles that examine the Influenza A/H1N1 pandemic and the worldwide spread of Ebola Virus Disease. We have identified seven primary factors that contribute to either vaccine hesitancy or acceptance. These factors include demographic variables such as ethnicity, age, sex, pregnancy, education, and employment, as well as considerations of accessibility and cost. Additionally, personal responsibility and risk perceptions, precautionary measures taken in relation to vaccination decisions, trust in health authorities and vaccines, the safety and efficacy of new vaccines, and a lack of information or exposure to vaccine misinformation are also influential factors. Insights on how participants have perceived and experienced vaccines throughout past pandemics will significantly contribute to the formulation of policies aimed at tackling the current COVID-19 pandemic. We examine the possible consequences of vaccination hesitancy on the implementation and efficacy of a prospective COVID-19 vaccine. Specifically, we maintain that skepticism against vaccinations may persist even in situations when vaccines are not accessible, which contradicts current understandings of vaccine reluctance. We suggest undertaking more study to evaluate the correlation between the availability and price of vaccinations, and the reluctance to get them.

Keywords: *vaccination reluctance, COVID-19, pandemic, epidemic, systematic review*

1. Introduction

The start of the new year has been characterized by the unparalleled dissemination of COVID-19, resulting in significant repercussions for individuals and healthcare systems worldwide. The virus has resulted in escalating mortality rates and a multitude of adverse health consequences in individuals. The pandemic has accelerated several scientific breakthroughs, perhaps including the development of a COVID-19 vaccine. Currently, there is a heightened need to do thorough research and expedite the development of a vaccine to combat the COVID-19 virus. Scientists globally have promptly created a vaccine for the illness using the genetic sequence of SARS-CoV-2 (Le et al., 2020). The value of a COVID-19 immunization is immeasurable due to its capacity to save many lives globally and alleviate the strain on existing healthcare systems.

Vaccination is an economically efficient public health intervention that may effectively halt the transmission of diseases and alleviate the burden they impose on society. Since the establishment of the WHO's Expanded Programme of Immunization in 1974 and the Global

Alliance for Vaccination and Immunization in 2000, the practice of vaccinating against infectious illnesses has significantly grown over time (Greenwood, 2014). Vaccination has effectively eliminated two significant illnesses, smallpox and rinderpest (Morens et al., 2011). Additional vaccinations have been created to combat rubella, influenza, poliovirus, measles, and several other infections. Although there are clear advantages to getting more people vaccinated, the persistent obstacles of vaccination hesitation and skepticism continue to hinder the well-being of individuals (Centers for Disease Control and Prevention, 2019).

Vaccine hesitancy has been shown to impact the prevention of diseases in previous pandemics, such as Severe Acute Respiratory Syndrome, Influenza A/H1N1, Middle East Respiratory Syndrome, and Ebola Virus Disease (Majid et al., 2020). Vaccine hesitancy refers to the act of refusing or delaying immunization, even when it is readily available (Majid and Ahmad, 2020a). Vaccine hesitancy is impacted by several variables, which might change based on the societal norms defended in different cultures and are contextually dependent (Majid and Ahmad, 2020a).

2. Vaccination

Vaccination plays a crucial role in halting the transmission of illnesses, especially among vulnerable groups such as pregnant women or those with weakened immune systems who are more prone to contracting the disease and experiencing its related symptoms (Doherty et al., 2016). Additionally, communities residing in regions with limited resources and financial constraints may lack the capacity to provide assistance to persons experiencing severe illness consequences. Research focused on developing solutions to combat vaccination reluctance is necessary due to the possible economic and health consequences of a preventable illness.

Prior research has revealed many variables that may contribute to the reluctance to get vaccines. As far as we know, there has been no comprehensive analysis or synthesis of information that has investigated how these variables contribute to vaccination reluctance during pandemics and epidemics. It is crucial to comprehend the factors contributing to the rise of vaccination hesitancy in the context of pandemics, epidemics, and global breakouts. These results might be crucial in guaranteeing widespread acceptance of a COVID-19 vaccination among the general population.

3. Demographic variables that have an impact on vaccination

According to a study by Mesch and Schwirian (2015), the Caucasian and Hispanic populations residing in the United States had a higher inclination towards vaccination compared to the Black community. Simultaneously, research conducted in the UK revealed that individuals of Black ethnicity had lower levels of vaccine acceptance in comparison to respondents of Asian or Caucasian descent (Myers and Goodwin, 2011). However, apart from this, we found no significant disparities in vaccination behavior across other ethnicities or races.

Four research (Ferrante et al., 2011; Myers and Goodwin, 2011; Rönnerstrand, 2013; Mesch and Schwirian, 2015) found that older populations were more inclined to vaccinate compared to young ones. Individuals in the central age range (35–49 years) in Italy were shown to have a lower propensity to seek immunization, as demonstrated by Ferrante et al. (2011). Older adults, due to their increased vulnerability to illness, are more likely to prioritize their health and hence have a greater inclination to be vaccinated (Mesch and Schwirian, 2015; Myers and Goodwin, 2011; Rönnerstrand, 2013).

Regarding sexual differences, both males and females were motivated to be vaccinated for various reasons (Hilton and Smith, 2010; Hilyard et al., 2010; Ferrante et al., 2011;

Gilles et al., 2011). According to Ferrante et al. (2011) and Gilles et al. (2011), males exhibited a higher likelihood of becoming vaccinated compared to females and also had a stronger belief in the effectiveness of vaccination

According to Hilton and Smith (2010) and Hilyard et al. (2010), women with young children in the UK and the USA were more worried about vaccinating their children. However, they were far less inclined than males to state their desire to vaccinate their children. Studies have shown that pregnant women in both the UK and the USA have expressed worries about the potential impact of vaccination on their babies. As a result, they have chosen to be vaccinated (Hilton and Smith, 2010; SteelFisher et al., 2011; Cassady et al., 2012). According to a research conducted in the USA, the percentage of pregnant women who received the vaccine was the highest among all the demographic categories evaluated, with half of them being vaccinated (Cassady et al., 2012).

According to a study by Börjesson and Enander (2014), women who had children aged 0 to 6 in Sweden had a higher likelihood of receiving vaccinations compared to other demographic groups. In a separate survey conducted in the United States, 40% of pregnant women said that they had already been administered the H1N1 vaccination, while an additional 8% expressed their intention to obtain the vaccine (SteelFisher et al., 2011). According to a study conducted by SteelFisher et al. in 2011, 67% of pregnant women in the USA felt that the H1N1 vaccination was safe for them to take. Out of this percentage, 26% considered it to be extremely safe, while 41% thought it was moderately safe.

However, research has also shown that pregnant women perceived conflicting information about medicine and pregnancy, which might impede the acceptance of vaccines in the United Kingdom (Hilton and Smith, 2010). Three participants in the survey used the example of Thalidomide to emphasize the risks associated with using inadequately evaluated medicinal therapies during pregnancy (Hilton and Smith, 2010). According to Myers and Goodwin (2011), a mere 32% of the UK's general public had confidence in the safety of vaccinating pregnant women during the swine flu epidemic. According to SteelFisher et al. (2011), 50% of the pregnant women surveyed said that they had no intention of being vaccinated or were uncertain about it. Therefore, in three studies (Hilton and Smith, 2010; Myers and Goodwin, 2011; SteelFisher et al., 2011), pregnant women who had concerns about the safety and effectiveness of the vaccination or lacked sufficient information were less inclined to be vaccinated.

Education level and work status were identified as significant demographic characteristics that impacted people' decision to vaccinate in six research (Hilyard et al., 2010; Myers and Goodwin, 2011; Börjesson and Enander, 2014; Wu et al., 2014; Irwin et al., 2017; Lin et al., 2018). One study conducted in China found that the rate of accepting the vaccine was 31.4%, and this rate was not influenced by sociodemographic factors such as education level (Wu et al., 2014). In contrast, a study conducted in Sweden found that social and demographic factors, including lower education level and lower income, were all statistically linked to lower vaccination rates (Börjesson and Enander, 2014).

According to Hilyard et al. (2010), those with greater levels of education were more likely to support the appropriate allocation and distribution of vaccinations. Furthermore, those with a minimum of a bachelor's degree or an annual income beyond $50,000 shown stronger endorsement for prioritizing individuals for vaccination if the vaccine becomes accessible (Hilyard et al., 2010). During the H1N1 pandemic in the UK, employed persons had a lower likelihood of being vaccinated, as shown by a research conducted by Myers and Goodwin in 2011. Conversely, a study conducted in the USA by Lin et al. in 2018 revealed that jobless individuals were more inclined to seek out vaccinations. During the Ebola Virus Disease epidemic in Guinea, there was a greater level of curiosity and willingness to take vaccinations among males and those who were affluent or well-

educated. However, characteristics such as religion and residing in either rural or urban areas did not influence the adoption of vaccines (Irwin et al., 2017).

4. Individual accountability and perceptions of potential hazards

Participants who chose to vaccinate assessed their personal risk based on various factors, such as their past experiences with seasonal influenza, their willingness to seek medical advice, having a family member or friend who had been infected with a vaccine-preventable disease, the belief that the infection was dangerous, quantitative scientific information about the vaccine and how the infection spreads, the belief that they had an increased risk due to pre-existing health conditions or age, having young children who are more vulnerable to infection, having access to radio, television, or electricity, having a positive attitude towards vaccines, feeling regretful for not vaccinating, and being a community leader (Chanel et al., 2011; Ferrante et al., 2011; Gilles et al., 2011; Myers and Goodwin, 2011; Boerner et al., 2013; Quinn et al., 2013; Börjesson and Enander, 2014; Mesch and Schwirian, 2015; Determann et al., 2016; Irwin et al., 2017).

Some individuals justified their decision to be vaccinated based on the belief that it is a societal obligation that is more important than any difficulties they may encounter, such as lengthy waiting periods (Hilton and Smith, 2010; Boerner et al., 2013). In addition, those who received vaccinations prioritized safeguarding their own health, their community, and vulnerable family members in order to mitigate the transmission of diseases (Boerner et al., 2013; Börjesson and Enander, 2014; Determann et al., 2016).

5. Preventive actions implemented in response to the decision to provide vaccinations

Individuals who opted for vaccination were more inclined to implement preventive actions to control the transmission of diseases. According to a study conducted in Sweden, vaccinated individuals reported higher rates of all three recommended behaviors. Specifically, 81.6% of vaccinated persons washed their hands more frequently compared to 68.7% of non-vaccinated individuals. Additionally, 78.8% of vaccinated individuals reported coughing and sneezing into their elbow compared to 69% of non-vaccinated individuals. Lastly, 64.9% of vaccinated individuals reported using disinfectants compared to 50% of non-vaccinated individuals (Börjesson and Enander, 2014). In contrast, a research carried out in India indicated that participants considered H1N1 vaccination to be of lesser importance compared to regular sanitation practices and adopting an organic and healthy lifestyle (Sundaram et al., 2014).

6. Conclusion

This systematic analysis investigated the variables that contributed to vaccination hesitation and adoption during pandemics, significant epidemics, and global outbreaks. A total of 28 papers were considered, which included the influenza A/H1N1 pandemic and Ebola Virus Disease. Our research identified seven primary factors that influenced the level of vaccine hesitancy and acceptance. These factors include demographic characteristics such as ethnicity, age, sex, pregnancy, education, and employment. Additionally, accessibility and cost of vaccines, personal responsibility and risk perceptions, precautionary measures taken in relation to vaccination decisions, trust in health authorities and vaccines, the safety and efficacy of new vaccines, and a lack of information or exposure to vaccine misinformation were also found to be significant factors.

Although we acknowledge that the COVID-19 pandemic has distinct characteristics compared to prior pandemics and outbreaks, we have identified certain parallels that enhance the relevance and practicality of our results in assisting present decision-making requirements. This is particularly true when the number of worldwide COVID-19 cases

increases, while the level of vaccination hesitancy is also increasing at the same time. It is crucial to prioritize the examination of variables that contribute to vaccine hesitancy and acceptance in order to promote public immunization and empower communities to overcome this significant obstacle.

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