The Effect of Social Perception on Vaccination’s Popularity

Abstract

Vaccination is the process of exposing your body to pathogen via a vaccine so that your adaptive immunity can create memory b-cells to help fight off the pathogens in case you should ever come in counter with them again. Vaccinations are important because they help prevent disease and help shorten the length of the illness if one does contract it. It has always been somewhat controversial amongst different groups of people for a number of different reasons. However, in recent years, at the hands of a disproven, fabricated study that falsely linked vaccinations to autism, controversy over vaccines is on the rise. Some of the reasons that some may opt out of vaccinations are allergies, health concerns, and religious reasons. However, as the controversy is on the rise preventable illness epidemics are as well. A 2017 stimulation study done in Spain found that widespread spreading of these illness was heavily influenced by people talking about what they think about vaccinations (Alvarez-Zuzek, La Rocca, Iglesias, & Braunstein, 2017). Essentially, now more than ever, people are talking about vaccinations- and these conversations could likely have an impact on their overall health as well as the overall health of the population around them, especially their relatives. This recent study showed that that more people in a population that were vaccinated, the less likely an epidemic is to occur (Alvarez-Zuzek et al., 2017). However, even with this reliable information readily available, controversy on vaccinations is still high.

Introduction

Ever since the medical breakthrough in the late 1700’s that was vaccination, vaccinations have been a way to control widespread disease deaths. The number of vaccines has risen since then. However, the number of epidemics that people commonly are dying from has drastically decreased since that time. Things that we vaccinate to try to protect ourselves and our families from include a range of things that go from small pox to polio to the influenza. Vaccinations effect everyone because they effect public health. Disease outbreaks rarely discriminate therefore vaccinations, or a lack thereof, have an impact on every one. Those especially impacted by vaccinations are those that are immunocompromised and may not even be able to get vaccines themselves for health reasons. Vaccinations are especially important to them even if they cannot receive them because their immune systems would be less efficient when fighting potential diseases. There has been much research that strongly supports the effectiveness and safety of vaccinations through the years. However, in 1998 a doctor published a fraudulent study linking a specific vaccination to autism. He also did press conferences that further linked the two. In 2010, he lost his license to practice medicine and his study was retracted as it was evidence of professional misconduct was found in regard to the study. Even though the study was retracted and the doctor lost his license, this was a major setback for vaccinations. While skepticism over vaccines has always existed, this study created much controversy over vaccines. This controversy has only been on the rise ever since. More and more people are questioning the safety of vaccinations for not only themselves but also their children. This is leading to outbreaks in diseases that have not been prevalent in America in many years due to the success of vaccinations. Also, now more than ever people are more vocal about their choices not to vaccinate. This leaves the door open for them to influence their peers, friends, and family into skipping over vaccinations as a whole as well. A recent stimulation study was done in Spain that considers the influence that people sharing their opinions on vaccination has on preventable disease epidemics in today’s society (Alvarez-Zuzek et al., 2017). This study evaluated the opinions of groups of people on vaccinations as well as the rise of disease within their population through using stimulation of a two-layer network (Alvarez-Zuzek et al., 2017). These layers are the epidemic (or lack thereof) of an illness and the opinion of the society of which it is effecting (Alvarez-Zuzek et al., 2017). These two layers are connected via a parameter *r (*Alvarez-Zuzek et al., 2017). Whenever *r* < 1 it represents a mildly committed society, when *r* > 1 it means that it is a very extreme society, when *r* = 0 the society is considered neutral (Alvarez-Zuzek et al., 2017). The vaccinated portion of the population is extremely pro-vaccination and they do not change (Alvarez-Zuzek et al., 2017). There are three model groups that are categorized by their status (Alvarez-Zuzek et al., 2017). *(S)* is for the susceptible, *(I)* for the infected, and *(R)* for the recovered (Alvarez-Zuzek et al., 2017). This model has proven to be successful in studying nonrecurring diseases. This study evaluates a number of factors other than just vaccinated or not, and for vaccinations or not. It also considers the effectiveness of the vaccination, the number of people who got sick or didn’t, what type of society people are most likely to get sick in (extreme pro-vaccination, extreme ant-vaccination, and neutral), as well as other factors (Alvarez-Zuzek et al., 2017).

Recent Progress

 This stimulation study was done in 2017 in Spain. In this stimulation study a common model for reproducing infectious diseases spreading was used; It is known as the SIR model (Alvarez-Zuzek et al., 2017). It was observed in this study that whenever two people have a conversation regarding vaccinations they did not only state their opinions on the matter, they also brought up arguments for their particular side of the issue; this is known as persuasion (Alvarez-Zuzek et al., 2017). Also studied here was whenever one is peer pressured into changing their opinion on an issue; this is known as compromise (Alvarez-Zuzek et al., 2017). In all cases, it was found that as the effectiveness of the vaccine went up, the number of those that had gotten sick and recovered *(R)* went down; this is because whenever the vaccination is known to be more effected, more people get the vaccination which leads to less people getting sick to begin with (Alvarez-Zuzek et al., 2017). This study found that a neutral society (*R*=0) is the best environment for preventing an epidemic (Alvarez-Zuzek et al., 2017). This is due to their being equal parts of persuasion and compromise in a neutral society, which makes it easier to convince people to get vaccinated (Alvarez-Zuzek et al., 2017). All in all, this study showed that personal opinions regarding vaccines does have an effect on possible disease epidemics (Alvarez-Zuzek et al., 2017).

Discussion

Social perception has always been very important as well as what information is being relayed to people. As can be seen by this study, the effect of word of mouth on the health of the general public is huge. These results show how people just simply talking about something that they are for or that they are against has the potential to affect the health of an entire population by essentially enabling (or disabling) the wide spread of sometimes deadly diseases. This is just one reason why those who are involved and educated in science and vaccinations must be vocal about them. It is our job to make sure that accurate, clear, and concise information is available to the public. In addition to this- we must do our best to make sure that this is the information that is being received by the public about vaccinations. If we speak out on the science of vaccines and let people know that they are safe and promote the general welfare of our nation, then we have a good chance of helping end potential unnecessary epidemics. This study helps us see that this is for certain a rising issue that must be addressed. While we know that we must get the correct information about vaccinations out to the people, the question still remains of how is the most effective way to do so. How can we change the minds of those who are already anti-vaccination? How can we fight the anti-vaccination propaganda that is out there? These are questions that are difficult to be answer. However, we, as members of the science community, must be diligent in our efforts if we want to see the skepticism take a downward turn and vaccinations become more widely accepted.

References

Alvarez-Zuzek, L. G., La Rocca, C. E., Iglesias, J. R., & Braunstein, L. A. (2017). Epidemic spreading in multiplex networks influenced by opinion exchanges on vaccination. PLoS ONE, 12(11), 1–14. https://doi.org/10.1371/journal.pone.0186492