

Working Thesis: Being vaccinated, despite vaccines' inherent risks, is significantly less risky than staying unvaccinated.

Wang, Shirley V., et al. "Methods for Addressing 'Innocent Bystanders' When Evaluating Safety of Concomitant Vaccines." *Pharmacoepidemiology and Drug Safety*, vol. 27, no. 4, 2018, pp. 405–412., doi:10.1002/pds.4399.

This paper analyzes the effect of MMR and DTAP on epileptic seizures. It concludes that, contrary to popular belief in antivax circles, being inoculated with MMR and DTAP on the same day does not significantly increase risk of a seizure. In addition, the paper finds that, besides MMR and DTAP, no other vaccines appear to cause epileptic seizures. The prevalence of seizures from DTAP is <1 in 10,000 without same day MMR; the prevalence of seizures from MMR is 3 in 10,000 independent of same day DTAP inoculation. For scale, the death rate from measles in developed countries is commonly acknowledged to be 1 in 1,000.

This research contributes to my paper by providing a scientific analysis and refutation of a common myth. This paper makes a strong case that the risk of receiving vaccines are far lower than those of staying unvaccinated.

Nicola Smith. "More Than 130 Dead in Measles Outbreak Blamed on Philippine Anti-vax Movement." *The Telegraph*, 19 February 2019. <https://www.telegraph.co.uk/global-health/science-and-disease/130-dead-measles-outbreak-blamed-philippine-anti-vax-movement/> Accessed 2 October 2019.

This news article describes a measles outbreak in the Philippines that was caused by anti-vaccine sentiments. The article describes how, several years ago, antivaxxers scandalized Sanofi (the pharmaceutical company that created Dengvaxia, a vaccine to prevent Dengue Fever) after it discovered that the vaccine could exacerbate the illness under certain conditions. The vaccine was linked to 16 deaths. While the vaccine still had a lower death rate than dengue fever itself, antivaxxer conspirators accused the government of "mass murder." This caused the people's trust in vaccine safety to plummet from over 80% in 2015 to just over 20% in 2018. The measles outbreak that was caused by low vaccination levels killed 130 people.

This new article contributes to my research by providing a startling example of the negative effects of antivax propaganda and a clear argument for vaccines.

Hussain, Azhar, et al. "The Anti-Vaccination Movement: A Regression in Modern Medicine." *Cureus*, Mar. 2018, doi:10.7759/cureus.2919.; (Accessed 2 October 2019).

This research paper research studies the effects of the antivax movement on the resurgence of measles in Western countries where once it was considered eliminated. It also analyzes the effect of the discredited medical doctor Andrew Wakefield, whose pseudo-research and activism have caused preventable outbreaks.

This research report contributes to my paper by providing an authoritative history and critical analysis of the antivax movement. It takes a definitively pro-vaccine stance, backing its points with facts and logic.

“Measles Outbreak among Vaccinated High School Students -- Illinois.” CDC Weekly, Center for Disease Control, 22 June 1984, www.cdc.gov/mmwr/preview/mmwrhtml/00000359.htm. (Accessed 2 October 2019).

This report on a measles outbreak from the CDC documents and analyzes another measles outbreak at a school in Illinois. The report is lauded by antivaxxers as scientific evidence that vaccines are ineffective at preventing disease.

This report contributes to my paper because it empirically supports an argument that antivaxxers use—that vaccines (sometimes) fail.

Nkowane, B M, et al. “Measles Outbreak in a Vaccinated School Population: Epidemiology, Chains of Transmission and the Role of Vaccine Failures.” *American Journal of Public Health*, U.S. National Library of Medicine, Apr. 1987, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1646939/>. (Accessed 2 October 2019).

This paper is used by the antivax community to “prove” that vaccines are ineffective, based on a measles outbreak in a population (Boston, MA) that was 98% vaccinated. The paper acknowledges the failure of the vaccine in this scenario, but does not disown vaccines in general as an effective way to defeat diseases. The paper further notes that the disease subsided after four generations of the disease.

This paper supports my report because it offers a peer-reviewed affirmation of a keystone of antivaxxer logic (that disease can break out in vaccinated communities).