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Taking the Politics Out of Vaccines: Increasing Vaccination Rates Without Repealing Exemptions

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TAKING THE POLITICS OUT OF VACCINES: INCREASING VACCINATION RATES WITHOUT REPEALING EXEMPTIONS

ABSTRACT

Vaccinations have become a vital part of disease prevention and public health; however, they remain a controversial topic in our society today. Non-medical exemptions to mandatory vaccination laws are the core of most of the controversy surrounding vaccinations. This Comment examines the controversy surrounding vaccinations and proposes interventions communities can adopt to increase vaccination rates without repealing non-medical exemptions to mandatory vaccination laws.

I. INTRODUCTION

On January 25, 2019, Washington State Governor Jay Inslee declared a state of emergency in response to more than a dozen confirmed cases of measles throughout the state.[1] The majority of the cases came from Clark County, Washington, which has one of the lowest vaccination rates in the state with only around 70.5% of all kindergarteners in public school having completed their vaccinations.[2] In fact, sixty-one out of the seventy-one confirmed cases of measles in Clark County were individuals who had never been vaccinated for measles.[3]

On the same day that Governor Inslee declared a state of emergency, Washington State Representative Paul Harris introduced a bill that prohibited all philosophical exemptions to the measles vaccination requirement.[4] This bill was previously introduced in 2015; however, it never made it to the House for a vote due to strong opposition.[5] While this bill has not yet been passed, it has sparked controversy throughout the state.[6] For example, an estimated 700 antivaccination supporters demonstrated outside of the bill hearing in protest of the proposed law.[7]

1. Jason Silverstein, *Measles Outbreak in Washington State Leads to State of Emergency*, CBS NEWS (Jan. 26, 2019), https://www.cbsnews.com/news/measles-outbreak-in-washington-state-leads-to-state-of-emergency/.

2. The vaccination rates of kindergarten-aged children in the county ranged from sixty-seven to seventy-nine percent. Wash. State Dep't of Health, Washington State School Immunization Rates, School Year 2017-2018 (Mar. 2018). Every childhood vaccination series requires more than one dose of the vaccine in order to be the most effective. *See Immunization*, CTRS. FOR DISEASE CONTROL & PREVENTION (Mar. 17, 2017), https://www.cdc.gov/nchs/fastats/immunize.htm. For example, the MMR vaccine, which protects against measles, mumps, and rubella is given in two doses. *Vaccine for Measles*, CTRS. FOR DISEASE CONTROL & PREVENTION (June 13, 2019), https://www.cdc.gov/measles/vaccination.html. A child is considered to have completed their vaccinations when they have received all required doses of the vaccine. *See id.*

3. *Measles Investigation*, CLARK COUNTY WASH. DEP'T. PUB. HEALTH (Apr. 29, 2019), https://www.clark.wa.gov/public-health/measles-investigation. The MMR vaccine, which protects against measles, is about ninety-seven percent effective in preventing measles, so it is still possible for an individual to become infected with measles, even if they have been vaccinated. *See Questions About Measles*, CTRS. FOR DISEASE CONTROL & PREVENTION (May 17, 2019), https://www.cdc.gov/measles/about/faqs.html. Additionally, the MMR vaccine requires two doses, given several years apart. *Id.* The vaccinated individuals in Washington who contracted measles may have been individuals who only received one dose of the vaccine or became infected with measles even though they were vaccinated.

4. *See generally* H.B. 1638, 66th Leg., 2019 Reg. Sess. (Wash. 2019). *See also* Silverstein, *supra* note 1.

5. Ashley May, *Hundreds Protest Against Washington State Vaccine Bill That Would Require Measles Shot*, USA TODAY (Feb. 11, 2019), https://www.usatoday.com/story/news/nation/2019/02/11/washington-vaccine-bill-protest-amid-measles-outbreak/2835502002/.

6. *Id.*

7. Lena H. Sun & Kristen Millares Young, *Health Officials Urge Passage Despite Strong Opposition from Parents Who Say They Want to Make Their Own Choices*, WASH. POST (Feb. 8,

This pattern of passing laws that eliminate non-medical exemptions to mandatory vaccination after a major disease outbreak is not a new phenomenon. In response to the large, multistate measles outbreak in 2015,[8] California Governor Edmund G. Brown signed SB 277, which eliminated personal and religious belief exemptions to vaccinations in the State of California.[9] During this outbreak, an estimated 110 individuals in California were infected with measles,[10] twelve of whom were infants too young to be vaccinated.[11]

Although the number of children in the United States who have not been vaccinated for preventable diseases has quadrupled since 2001,[12] vaccination coverage in the United States has remained high.[13] Over ninety percent of children have received all of the Centers for Disease Control and Prevention's (CDC) recommended childhood vaccinations.[14] Nevertheless, vaccination coverage varies considerably from state to state. For example, in the State of Washington, only 88.5% of children are vaccinated against measles, compared to Massachusetts, where 98.3% of children have received the measles vaccine.[15] There are many reasons why parents choose to not vaccinate their children. These reasons include religion, personal beliefs, and safety concerns.[16] While all states have laws specifying what vaccinations are required for a child prior to entering school, states vary on what exemptions are available for parents who

2019), https://beta.washingtonpost.com/health/2019/02/08/washington-measles-outbreak-draws-crowd-hearing-vaccine-law/.

8. *Measles Cases and Outbreaks*, CTRS. FOR DISEASE CONTROL & PREVENTION (May 17, 2019), https://www.cdc.gov/measles/cases-outbreaks.html.

9. *California State Vaccination Requirements*, NAT'L VACCINE INFO. CTR. (Nov. 20, 2018), https://www.nvic.org/Vaccine-Laws/state-vaccine-requirements/california.aspx.

10. *Measles Outbreak – California, December 2014-February 2015*, CTRS. FOR DISEASE CONTROL & PREVENTION (Feb. 20, 2015), https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6406a5.htm?s_cid=mm6406a5_w.

11. *Id.*

12. This number accounts for children who have received one or more doses of a particular vaccine, even though many vaccinations require more than one dose to be effective. *See* Holly A. Hill et al., *Vaccination Coverage Amount Children Aged 19-35 Months – United States, 2017*, MORBIDITY & MORTALITY WKLY. REP. (2018), https://www.cdc.gov/mmwr/volumes/67/wr/pdfs/mm6740a4-H.pdf.

13. *Id.*

14. The CDC's recommended vaccinations are the poliovirus vaccine, MMR vaccine, hepatitis B vaccine, and varicella vaccine. *See id.*

15. *See Supplementary Table 2. Estimated Vaccination Coverage with Selected Individual Vaccines and a Combined Vaccine Series* Among Children Aged 19–35 Months, Overall and by U.S. Department of Health and Human Services (HHS) Region, State and Local Area*, CTRS. FOR DISEASE CONTROL & PREVENTION (Oct. 12, 2018), https://stacks.cdc.gov/view/cdc/59415. This number varies for different diseases. For example, in Washington, eighty-one percent of children have received the DTaP vaccine, while approximately ninety-two percent of children have received the DTaP vaccine in Massachusetts. *Id.*

16. Chephra McKee & Kristin Bohannon, *Exploring the Reasons Behind Parental Refusal of Vaccines,* 21 J. PEDIATRIC PHARMACOLOGY THEORY 104, 106–07 (2016).

do not want to vaccinate their children.[17] All fifty states allow for medical exemptions to mandatory vaccinations; however, forty-five states also allow for religious exemptions and fifteen states allow for additional philosophical or personal belief exemptions.[18]

The use of exemptions to mandatory vaccination laws continues to rise in certain states.[19] These exemptions are popular because they allow parents the freedom to choose whether or not to vaccinate their child.[20] However, the consequences of these exemptions can be harmful.[21] With an increasing number of individuals claiming exemptions to required vaccinations, preventable diseases are spreading.[22] The only way to stop these diseases from spreading is for a community to gain herd immunity. Herd immunity is present when a sufficient percentage of a population is immune against a certain disease to prevent its spread.[23]

The increased use of exemptions has lowered vaccination rates in some states so much as to threaten herd immunity. For example, in Clark County, Washington, around eight percent of kindergarteners claimed exemptions instead of getting vaccinated in 2017.[24] In turn, this has caused the county's vaccination rate for kindergarteners to fall to almost 73.5%.[25] This Comment will focus on achieving the threshold of herd immunity, especially in counties or states that have dropped below that threshold.[26]

In the wake of a disease outbreak, both Washington and California enacted laws that mandated vaccination for virtually all children by eliminating religious and philosophical exemptions to mandatory vaccines.[27] Although eliminating these exemptions may improve a population's herd immunity, these types of

17. *Id.* at 104.

18. *See States with Religious and Philosophical Exemptions from School Immunization Requirements*, NAT'L CONF. ST. LEGIS. (June 14, 2019), http://www.ncsl.org/research/health/school-immunization-exemption-state-laws.aspx.

19. Michael Devitt, *Study Finds Disturbing Trends in Vaccination Exemptions*, AAFP (June 20, 2018), https://www.aafp.org/news/health-of-the-public/20180620vaccineexempts.html.

20. Barbara Loe Fisher, *Vaccine Freedom of Choice,* NAT'L VACCINE INFO. CTR. (Oct. 16, 2008), https://www.nvic.org/informed-consent/freedomofchoice.aspx.

21. *See* Devitt, *supra* note 19.

22. *See Measles Cases and Outbreaks*, *supra* note 8.

23. *See Vaccines Protect Your Community,* U.S. DEP'T. HEALTH & HUM. SERVS. (Dec. 2017), https://www.vaccines.gov/basics/work/protection/index.html.

24. The range of kindergarteners claiming exemptions in 2017–2018 was 5.642–10.345%. *See* Wash. State Dep't of Health, *supra* note 2. This number does not account for unvaccinated individuals who did not claim exemptions. *Id.*

25. The range of kindergarteners who completed required vaccinations in the 2017–2018 school year was 67.689–79.310%. *Id.*

26. *See infra* notes 65–112 and accompanying text.

27. Rachel La Corte, *Vaccine Exemption Bill Among Hundreds of State Laws Taking Effect*, ASSOCIATED PRESS (July 26, 2019), https://komonews.com/news/local/vaccine-exemption-bill-among-hundreds-of-state-laws-taking-effect.

laws can be challenging to pass.[28] Politicians who pass vaccination laws are cautious of the political and legal backlash these laws may cause and are typically unwilling to pass these laws unless a major outbreak occurs.[29] Implementing interventions at the local level through administrative agencies, instead of through the legislature, may be more effective in increasing vaccination rates.

Without eliminating non-medical vaccination exemptions, there are permanent steps states can take to improve vaccination rates in order to achieve herd immunity for the following diseases: measles, pertussis, mumps, rubella, and polio. To achieve immunity for these diseases, states should impose a layering of interventions designed to reach unvaccinated patients. These interventions should be supported by effectiveness data. Specifically, states should first implement reminder and recall systems for health care providers and clients. If these interventions do not achieve herd immunity, states should then implement home visits and school and organized childcare center-based interventions for the remaining unvaccinated population.

This Comment discusses implementing new interventions in order to increase vaccination rates among children in order to achieve herd immunity in a community. Part II of this Comment discusses the political nature surrounding vaccines and the importance of herd immunity. Part III of this Comment discusses interventions that have been successful in achieving higher vaccination rates and how to best implement these interventions. Criticisms of these interventions and ideas are discussed periodically throughout the Comment.

II. BACKGROUND

A. The Political Challenges Surrounding the Elimination of Philosophical and Religious Exemptions to Mandatory Vaccination Laws

Vaccine policy is political by nature.[30] Vaccination laws are controversial because, at their core, they bring two important American rights to a direct conflict—the right to refuse medical treatment and the right of the general public to be safe from harm.[31] Since there are no federal laws mandating vaccinations, each state is left to make its own policies surrounding vaccines.[32] However,

28. *See* James Colgrove, *Immunity for the People: The Challenge of Achieving High Vaccine Coverage in American History*, 122 PUB. HEALTH REP. 248, 250 (2007).

29. *See id.*

30. Rene F. Najera, *Vaccine Policy is Political by Its Very Nature*, HIST. VACCINES (Oct. 18, 2018), https://www.historyofvaccines.org/node/2396.

31. *Id.*

32. *Id.*

many politicians make these policies based on anticipated elections and political popularity.[33]

The politicization of vaccinations is not a new concept. Public concerns about the safety of vaccinations and vaccine legislation date back to the mid-1800s with the "anticompulsory vaccination league against [the] mandated smallpox vaccin[e]."[34] Antivaccination groups today share many of the same concerns about vaccines as groups in the 1800s did, with arguments primarily "against mandated vaccination, or imposed vaccin[ation] schedules."[35] However, one difference between antivaccination groups in the 1800s and antivaccination groups today is that today these groups have new levels of global reach and influence due to the Internet and social media.[36] These groups can now influence individuals who are not already against vaccinations but are seeking information about the safety of and the need for vaccinations.[37]

Public concerns about vaccination can also stem from the publication of new research.[38] For example, in 1994, a publication by Talwar and colleagues about an "antipregnancy vaccine" mentioning tetanus was misinterpreted by a pro-life Catholic group to suggest that vaccines could lead to sterility.[39] This led to a widespread fear of vaccinations in many parts of the world including Mexico and the Philippines.[40] Four years later, in 1998, Dr. Andrew Wakefield published research that "proposed links between the MMR vaccination, autism, and bowel disease."[41] Additionally, he made statements at a highly publicized press conference about vaccinations that were not included in his published research.[42] Dr. Wakefield's work was later discredited,[43] and was even described as an "elaborate fraud."[44] However, his research gained high levels of exposure throughout the world, especially in the United States, and left a widespread fear of vaccinations—which still persists today.[45] For example, two celebrity mothers shared personal stories about how they believe the MMR

33. *See* Mara Liasson, *5 Things the Vaccine Debacle Reveals About the 2016 Presidential Field*, NPR (Feb. 5, 2015, 10:05 AM), https://www.npr.org/sections/itsallpolitics/2015/02/05/383904342/5-things-the-vaccine-debacle-reveal-about-the-2016-presidential-field.

34. Heidi J. Larson et al., *Addressing the Vaccine Confidence Gap*, 378 LANCET 526, 526 (2011).

35. *Id.*

36. *See id.*

37. *Id.*

38. *Id.* at 528.

39. Larson et al., *supra* note 34, at 528.

40. *Id.*

41. *Id.*

42. *Id.*

43. *Id.* at 531.

44. Fiona Godlee et al., *Wakefield's Article Linking MMR Vaccine and Autism Was Fraudulent*, 342 BMJ 64, 64 (2011).

45. Larson et al., *supra* note 34, at 528.

vaccine caused their child's autism on the *Oprah Winfrey Show*.[46] Pediatricians throughout the country have reported that parents have refused vaccinations for their children based on what they have seen in the media and on shows such as *Oprah*.[47]

Currently, the political climate surrounding vaccinations has been shaped by legislatures and advocates. As vaccinations have become more widespread and, in some cases, universally mandatory, the antivaccination community has become "more vocal about the distribution of vaccinations," primarily with respect to routine childhood immunizations.[48] Parents oppose vaccinations for a variety of reasons.[49] These reasons include, but are not limited to, "religious beliefs, personal beliefs . . . safety concerns, and a desire for more information [about vaccines] from healthcare providers."[50] Other factors may also contribute to a child's vaccination status, such as socioeconomic status.[51] Because there are parents who are highly opposed to vaccinations, some politicians believe that a mandatory vaccination policy is politically infeasible.[52] Therefore, despite believing that vaccinations are beneficial, and even having vaccinated their own children, some politicians take public stands against vaccination mandates and express a distrust of vaccines.[53] For example, Senator Rand Paul of Kentucky, who vaccinated his own children,[54] stated to a conservative radio host that there were "many tragic cases of walking, talking normal children who wound up with profound mental disorders after vaccines."[55]

The politicization of vaccinations has become particularly apparent during major elections. The use of the vaccination issue in the 2016 presidential election provided evidence of the strong link between politics and vaccination laws.[56] During the Republican primary, several candidates expressed some uncertainty surrounding vaccinations.[57] The eventual Republican nominee and current

46. Rahul K. Parikh, *Fighting for the Reputation of Vaccines: Lessons from American Politics*, 121 PEDIATRICS 621, 621 (2008).

47. *Id.*

48. Ellen C. Tolsma, *Protecting Our Herd: How a National Mandatory Vaccination Policy Protects Public Health by Ensuring Herd Immunity*, 18 J. GENDER, RACE & JUST. 313, 318 (2015).

49. *Id.* at 318–19.

50. McKee & Bohannon, *supra* note 16, at 104.

51. *See id.* at 105.

52. Tolsma, *supra* note 48, at 319.

53. *See* Bert Baumgaertner et al., *The Influence of Political Ideology and Trust on Willingness to Vaccinate*, 13 PLOS ONE 1, 3 (2018).

54. Jeremy W. Peters & Richard Pérez-Peña, *Measles Outbreak Proves Delicate Issue to G.O.P Field*, N.Y. TIMES (Feb. 2, 2015), https://www.nytimes.com/2015/02/03/us/politics/measles-proves-delicate-issue-to-gop-field.html.

55. *See* Michelle Fox, *Vaccines Should Be Voluntary: Rand Paul*, CNBC (Feb. 2, 2015, 5:34 PM), https://www.cnbc.com/2015/02/02/vaccines-should-be-voluntary-rand-paul.html.

56. Baumgaertner et al., *supra* note 53, at 3.

57. *See id.*

President, Donald J. Trump, has used Twitter since March of 2012 to express his belief in a link between autism and vaccinations.[58]

Not only are there political challenges to eliminating non-medical vaccination exemptions, but this issue has also been brought to the courts. In the 1905 landmark Supreme Court's decision of *Jacobson v. Massachusetts*, the plaintiff alleged that mandatory vaccination laws violated his Fourteenth Amendment rights.[59] The Court denied the plaintiff's claim, holding that the state had authority to enact "health laws of every description."[60] Although this case shows that there are not any constitutional issues surrounding the elimination of non-medical exemptions to vaccination requirements, the issue of mandatory vaccination continues to be brought to the courts. When California eliminated all non-medical exemptions from mandatory vaccine laws in 2016, antivaccination advocates sued the state on grounds that the new law violated their freedom of religion and their right to education.[61] The Second District Court of Appeals in Los Angeles rejected these challenges to the law, stating the law was not discriminatory and was a valid measure taken to protect public health.[62]

Due to the political controversy surrounding vaccines, politicians are unlikely to propose (or pass) bills eliminating religious and philosophical exemptions from vaccination laws except following major outbreaks like in California or Washington. Instead of trying to pass new laws eliminating non-medical exemptions to vaccinations, public health advocates should instead focus on policy changes to vaccination requirements that do not require changes to the legislation. These policy changes would involve using state and local administrative authorities to implement public health interventions that should improve vaccination rates.

State and local administrative authorities have the power to develop rules and regulations through discretionary powers given to them by Congress.[63] The individuals who run these agencies are typically experts in their field and are not traditional "politicians."[64] Because these individuals are not politicians, they do not face the political pressures lawmakers may face. Thus, these agencies have

58. *Id.*

59. Jacobson v. Commonwealth of Massachusetts*,* 197 U.S. 11, 11–14 (1905).

60. *Id.* at 25.

61. *See* Bob Egelko, *California's Mandatory-Vaccination Law Survives Court Test,* S.F. CHRON. (Jul. 19, 2018, 9:50 AM), https://www.sfchronicle.com/health/article/California-s-mandatory-vaccination-law-survives-13047905.php/.

62. *Id.*

63. ELIZABETH SLATTERY, WHO WILL REGULATE THE REGULATORS? ADMINISTRATIVE AGENCIES, THE SEPARATION OF POWERS, AND CHEVRON DEFERENCE 2 (THE HERITAGE FOUND. Legal Memorandum No. 153, 2015).

64. *See* Richard A. Epstein, *Why the Modern Administrative State is Inconsistent with the Rule of Law,* 3 N.Y.U. J.L. & LIBERTY 491, 505 (2008).

the power to enforce interventions that increase vaccination rates without passing formal bills or laws, taking much of the politics out of vaccine regulation.

B. Pursuing Herd Immunity Over a 100% Vaccination Rate

The interventions implemented by administrative agencies in order to increase vaccination rates should aim to achieve herd immunity. Herd immunity is an important goal because it ensures that even if an individual does become infected with a disease, the disease will not spread throughout the community.[65] Vaccine preventable diseases are a great threat to the health of a community for many reasons. First, many of these diseases are highly contagious.[66] For example, the measles virus spreads through the air and can last on a surface for up to two hours after the infected person has left the area.[67] Second, many of these diseases have devastating health effects.[68] For example, polio can result in complete paralysis and even death.[69] Finally, many of these diseases were once completely eliminated in the United States.[70] However, with fewer people getting vaccinated, some communities no longer have herd immunity against once eliminated, vaccine preventable diseases.[71] Currently, the United States as a whole is beginning to see more cases of these once-eliminated diseases.[72] With these diseases back in the United States, achieving herd immunity to protect the health of communities is more important than ever.

In general, "herd immunity is a form of immunity that occurs when the vaccination of a significant population (or herd) provides a measure of protection for individuals who have not developed immunity."[73] When herd immunity exists, germs cannot spread as easily between individuals because so many individuals are immune to the disease.[74] This, in turn, makes it so the

65. *See Vaccines Protect Your Community*, *supra* note 23.

66. *See Measles*, MAYO CLINIC (May 24, 2019), https://www.mayoclinic.org/diseases-conditions/measles/symptoms-causes/syc-20374857.

67. *Id. See Transmission of Measles*, CTRS. FOR DISEASE CONTROL & PREVENTION (Feb. 5, 2018), https://www.cdc.gov/measles/transmission.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fmeasles%2Fabout%2Ftransmission.html.

68. *See What is Polio?*, CTRS. FOR DISEASE CONTROL & PREVENTION (Jul. 25, 2017), https://www.cdc.gov/polio/about/.

69. *Id.*

70. *The Reemergence of Vaccine-Preventable Diseases: Exploring the Public Health Successes and Challenges,* CTRS. FOR DISEASE CONTROL & PREVENTION (Feb. 10, 2015), https://www.cdc.gov/washington/testimony/2015/t20150210.htm.

71. *See id.*

72. *Id.*

73. *See What is Herd Immunity?*, VACCINES TODAY (Feb. 7, 2015), https://www.vaccinestoday.eu/stories/what-is-herd-immunity?.

74. *Id.*

community as a whole is less likely to experience an outbreak of the disease.[75] Eventually, the disease for which the community has herd immunity becomes rare and may be eliminated altogether.[76] Herd immunity protects a community from experiencing an epidemic of a particular disease.[77] This means that even individuals who are not vaccinated will have some protection from the disease and, if an individual does get sick, there is a lower chance of an outbreak because it is "harder for the disease to spread."[78] Herd immunity is especially important because some individuals cannot get vaccinated for certain diseases due to a weakened immune system; further, some individuals do not have a strong immune response from vaccines.[79] A population is only protected against an epidemic of an infectious disease if a population has a sufficient number of vaccinated individuals so as to achieve herd immunity against that disease.[80] While herd immunity does not ensure that every individual is immune to a disease, it does prevent a disease from spreading.[81]

When an individual is vaccinated against a certain disease, he/she develops an immune response against that disease and thus contributes to their herd's immunity.[82] Vaccines allow an individual to develop immunity against a disease by "imitating an infection."[83] This infection, however, rarely causes illness.[84] Instead, it causes the immune system to produce T-lymphocytes and antibodies.[85] Once the imitated infection is cured, the body is left with memory T-lymphocytes and B-lymphocytes that will "remember how to fight" the infection the next time the individual is exposed.[86] This, in turn, gives the individual immunity against the disease. He/she is unlikely to get infected the next time they are exposed to the disease since his/her cells know how to fight against the infection.[87]

A community attains herd immunity against a disease when enough individuals are vaccinated against a certain disease so that the disease cannot

75. *See Vaccines Protect Your Community*, *supra* note 23.

76. *See id.*

77. *Id.*

78. *Id.*

79. *Id.*

80. *See Vaccines Protect Your Community, supra* note 23. *See also* Tolsma, *supra* note 48, at 334 (explaining that a "critical portion" of the community must be immunized for herd immunity to occur).

81. *Id.*

82. *Understanding How Vaccines Work*, CTRS. FOR DISEASE CONTROL & PREVENTION (Jul. 2018), https://www.cdc.gov/vaccines/hcp/conversations/downloads/vacsafe-understand-color-office.pdf.

83. *Id.*

84. *Id.*

85. *Id.*

86. *Id.*

87. *See Understanding How Vaccines Work*, *supra* note 82.

travel as easily from one person to another.[88] Once a community achieves herd immunity, individuals in the community are less likely to get a disease.[89] However, a group of unvaccinated individuals can damage herd immunity. If a community has a high number of unvaccinated individuals, it is at risk for an epidemic of a disease.[90]

Herd immunity does not require that 100% of individuals in a community are vaccinated.[91] It instead requires that "enough" individuals are vaccinated so that the disease does not spread.[92] This number can vary across different diseases. For example, in order for herd immunity to be effective against mumps, measles, rubella, and pertussis, there must be ninety-five percent or more individuals vaccinated against the disease.[93] However, for a less contagious disease, such as polio, only eighty percent of individuals need to be vaccinated.[94] It is important to consider herd immunity at both state and county levels because herd immunity exists when enough individuals in close proximity to each other are vaccinated so that a disease does not spread through that community.[95] Currently, many states are very close to achieving herd immunity against many of the vaccine preventable diseases. For example, in 2017, 80.3% of nineteen to thirty-five-month-old children in Washington State had received all recommended doses of the MMR vaccine, which protects against mumps, measles, and rubella.[96] This number was lower for the DTaP vaccine, which protects against pertussis, where only 68.3% of children ages 19-35 months have received the recommended doses of the vaccine.[97] Additionally, 79.2% of children between the ages of nineteen and thirty-five months in Washington have received the polio vaccine.[98] Even though these statewide vaccination rates may be close to or at the threshold for herd immunity, many individual counties within the states have much lower rates. For example, in Clark County, Washington, which was the starting point for the most recent measles outbreak,

88. *See What is Herd Immunity?*, *supra* note 73.

89. *Vaccines Protect Your Community*, *supra* note 23.

90. *See id.*

91. *See What is Herd Immunity?*, *supra* note 73.

92. *Id.*

93. *See* Tolsma, *supra* note 48, at 334.

94. Oxford Vaccine Group, *Herd Immunity: How Does it Work?* (Apr. 26, 2016), https://www.ovg.ox.ac.uk/news/herd-immunity-how-does-it-work.

95. *See Vaccines Protect Your Community*, *supra* note 23.

96. *See Public Health Measures*, WASH. ST. DEP'T. PUB. HEALTH, https://www.doh.wa.gov/DataandStatisticalReports/HealthDataVisualization/ImmunizationDataDashboards/PublicHealthMeasures (last visited Aug. 25, 2019); *View Data,* WASH. ST. DEP'T. PUB. HEALTH, https://www.doh.wa.gov/DataandStatisticalReports/HealthDataVisualization/ImmunizationDataDashboards/PublicHealthMeasures (click "Percent Complete" axis on bar graph; then follow "View Data" hyperlink) (last visited Aug. 25, 2019).

97. *See View Data*, *supra* note 96; *Public Health Measures*, *supra* note 96.

98. *See View Data*, *supra* note 96.

the vaccination rates for kindergarteners is 76.5%.[99] It is important for each individual county to achieve herd immunity in order to protect the individuals living in that county from contracting vaccine preventable diseases.

Local administrative agencies should implement interventions that aim to achieve herd immunity within a community. While a 100% vaccination rate may be ideal, it is never achievable. A 100% vaccination rate is not necessary for a community to achieve herd immunity and to therefore protect itself from an outbreak of disease.[100] Such a vaccination rate is not achievable for many reasons. First, some individuals cannot get vaccinated due to certain health conditions such as HIV or cancer.[101] Further, some individuals have a certain biological response to vaccinations by which they cannot obtain immunity even after being vaccinated.[102] Additionally, some children will never get vaccinated even if their state does pass a law that eliminates non-medical exemptions. Some children are not vaccinated due to geographic and sociological factors, and parent opposition to vaccines has nothing to do with it.[103] For example, children who are insured by Medicaid have 2.5–15% lower vaccination coverage than children with private insurance.[104] Additionally, children living in rural areas tend to have a 2.6–6.9% lower vaccination coverage than children living in urban areas.[105] Moreover, some parents may not be adamantly opposed to their child receiving vaccinations but instead have a slight distrust of vaccinations.[106] Due to the ease in many states of establishing a non-medical exemption, many parents with a slight distrust of vaccines choose to claim an exemption instead of vaccinating their child.[107]

99. *See* Wash. State Dep't of Health, *supra* note 2; *School Immunization Data Table*, WASH. ST. DEP'T PUB. HEALTH (May 2018), https://www.doh.wa.gov/DataandStatisticalReports/HealthBehaviors/Immunization/SchoolReports/DataTables (follow "Kindergarten Data, 20172018 School Year" hyperlink).

100. *See* Paul Fine et al., "*Herd Immunity": A Rough Guide*, 52 CLINICAL INFECTIOUS DISEASES 911, 914 (2011).

101. *See* Ahmet Arvas, *Vaccination in Patients with Immunosuppression*, 49 TURK. ARCHIVES PEDIATRICS 181, 181–183 (2014).

102. *See* Fine, *supra* note 100, at 915.

103. Jim Wappes, *More Young US Kids Not Getting Vaccinated*, U. MINNESOTA (Oct. 12, 2018), http://www.cidrap.umn.edu/news-perspective/2018/10/more-young-us-kids-not-getting-vaccinated. *See also* Holly A. Hill et al., *Vaccination Coverage Among Children Aged 19–35 Months—United States, 2017*, 67 MORBIDITY & MORTALITY WKLY. REP. 1123, 1123, 1126–27 (2018).

104. *See* Wappes, *supra* note 103.

105. *Id.*

106. *See Dealing with Parents' Mistrust of Vaccines,* HARV. T.H. CHAN SCH. PUB. HEALTH, https://www.hsph.harvard.edu/news/hsph-in-the-news/dealing-with-parents-mistrust-of-vaccines/ (last visited Feb. 25, 2019).

107. Saad B. Omer et al., *Trends in Kindergarten Rates of Vaccine Exemption and State-Level Policy, 2011–2016*, 5 OPEN F. INFECTIOUS DISEASES 1, 1 (2017).

While interventions suggested for implementation in this Comment will never reach the individuals who cannot get vaccinated and are unlikely to change the minds of parents strongly opposed to vaccines, they should be effective for children who are not vaccinated for other reasons. By vaccinating such children, it is likely that their communities will achieve herd immunity, which in turn will protect those children who will never be vaccinated.

Not striving for a 100% vaccination rate may seem unethical. What about the unvaccinated children who may still get a deadly disease? With herd immunity, the unvaccinated child's chances of getting the disease are much lower because their exposure to the disease is much less. If there are fewer individuals that become infected with the disease because they have immunity as a result of their vaccination, then the individuals who are not vaccinated are less likely to be exposed to the disease. Thus, herd immunity protects everyone, not just those who are vaccinated.[108]

III. RECOMMENDATIONS

A. Explanation of the Community Guide

In order to improve vaccination rates, administrative agencies should implement interventions that are supported by scientific research to be effective in increasing vaccination rates. The Community Guide, through the Community Preventative Services Task Force (CPSTF), provides explanations of evidence-based interventions that scientific studies have shown to be effective.[109]

The CPSTF was established in 1996 by the U.S. Department of Health and Human Services. It was established to develop guidance—based on scientific evidence—of which community-based health promotion and disease prevention intervention approaches are effective.[110] The CPSTF is an independent panel of public health and prevention experts that represents a broad range of expertise in "community preventative services, public health, health promotion, and disease prevention."[111] The CPSTF is supported by thirty-two "liaison organizations that represent federal agencies" that are vested in America's health.[112] The CDC provides the CPSTF with both scientific and administrative support.[113]

108. *See generally* Fine et al., *supra* note 100, at 911–14.

109. *About the Community Guide,* COMMUNITY GUIDE, https://www.thecommunityguide.org/about/about-community-guide (last visited Aug. 25, 2019).

110. *About the Community Preventative Task Force,* COMMUNITY GUIDE, https://www.thecommunityguide.org/task-force/about-community-preventive-services-task-force (last visited Aug. 25, 2019).

111. *Id.*

112. *Id.*

113. *Id.*

The CPSTF issues findings based on "systematic reviews of effectiveness and economic evidence that are conducted with a methodology developed by the Community Guide Branch."[114] This methodology involves a formal process whereby all relevant studies of the specific topic to be analyzed are identified, the quality of the studies is assessed, and the collective evidence is summarized.[115] This methodology is used because it allows the CPSTF to make sense of large bodies of scientific literature by applying a systematic and scientifically defensible process.[116] Each review is conducted by "specialists in systematic review method[ologie]s" and also by other subject matter experts.[117]

All of the intervention approaches systematically reviewed by the CPSTF are intended to "improve health directly; prevent or reduce risky behaviors, disease, injuries, or complications, or detrimental environmental or social factors; or promote healthy behaviors and environments."[118] When the CPSTF "recommend[s]" a finding, it means that the systematic review of the available studies provides "strong or sufficient evidence that the intervention is effective."[119] The CPSTF recommendations use the terms "strong" and "effective" to reflect the "degree of confidence the CPSTF has that an intervention has beneficial effects."[120] This categorization is based on multiple factors such as the number of studies, the design of studies, and the consistency of effect across studies.[121] This means that the terms "strong" and "sufficient," when used by the CPSTF in a recommendation, are not solely related to the magnitude of a finding from a single or small number of studies. Rather, the terms are related to a body of research that supports an intervention.[122] Conversely, when the CPSTF recommends against an intervention, it means that the systematic review of available studies indicates that the intervention is ineffective or even harmful.[123]

Additionally, the CPSTF includes sections in their reports called "costs" and "economic benefits." These sections are only reported when an intervention is found to be effective.[124] The CPSTF conducts economic reviews by either cost analysis, cost-benefit analysis, cost-utility analysis, or cost-effectiveness

114. *About the Community Guide*, *supra* note 109.

115. *Our Methodology,* COMMUNITY GUIDE, https://www.thecommunityguide.org/about/our-methodology (last updated Aug. 28, 2019).

116. *Id.*

117. *Id.*

118. *About the Community Guide*, *supra* note 109.

119. *Our Methodology*, *supra* note 115.

120. *Id.*

121. *Id.*

122. *See id.*

123. *Id.*

124. *Our Methodology*, *supra* note 115.

analysis.[125] Typically, economic evaluations are done separately from the effectiveness evaluation.[126]

All of the interventions recommended in this Comment are recommended by the CPSTF. The CPSTF only recommends interventions that have a strong foundation of evidence for their effectiveness in improving health outcomes. The CPSTF has identified the interventions listed in this Comment as fully supported by research findings. Therefore, when these interventions are implemented correctly, people can have full confidence that these interventions will be successful and that vaccination rates in communities will increase.

B. Explanation of Recommended Interventions

In order to increase vaccination rates, state or local administrative agencies should implement interventions that have been proven to be effective, through scientific evidence, in increasing vaccination rates. Through a careful review of all relevant scientific studies, the CPSTF has found all of the interventions provided below to be effective in increasing vaccination rates.

1. Client Reminder/Recall Systems

The first intervention a state or local administrative agency should implement to improve vaccination rates are client reminder and recall systems. "Client remainder and recall systems are used to remind members of a target population that vaccinations are due (reminders) or are late (recall)."[127] Client reminders and recalls differ in content and may be delivered by various methods including telephone calls, postcards, and text messages.[128] Client reminders and recalls should be tailored to each individual client and may contain educational information about the "importance of vaccination."[129] Client reminder and recall interventions are most successful when implemented in conjunction with another type of intervention.[130]

Client reminders and recalls may be delivered by various methods. Researchers found text message reminders to be successful in increasing vaccination rates, particularly with regard to the HPV vaccine.[131] Even though

125. *Economic Reviews*, COMMUNITY GUIDE, https://www.thecommunityguide.org/about/economic-reviews (last updated Aug. 28, 2019).

126. *Id.*

127. CMTY. PREVENTATIVE SERVS. TASK FORCE, *Increasing Appropriate Vaccination: Client Reminder and Recall Systems*, COMMUNITY GUIDE 1, 1 (2015), https://www.thecommunityguide.org/sites/default/files/assets/Vaccination-Client-Reminders.pdf [hereinafter *Client Reminder and Recall Systems*].

128. *Id.*

129. *Id.*

130. *Id.*

131. Elyse Olshen Kharbanda et al., *Text Message Reminders to Promote Human Papillomavirus Vaccination*, 29 VACCINE 2537, 2539 (2011).

the HPV vaccination is typically administered in three doses, text message reminder and recall notices should be successful in increasing vaccination rates for vaccines that require any number of doses.[132] One way to further improve vaccination rates through client reminders or recalls via text messaging would be to personalize the text messages with the patient's name. In addition, the patient's language preference for the text messages should be obtained.[133]

Email is another potentially effective tool to send client reminder or recall notices. Not only is email now widely used both as a professional and social tool for communication, it is predicted (and is already true to a certain extent) that email will begin to replace paper mail in the future.[134]

Client reminder and recall notices could even include features that allow the client to maintain an active role in managing their health.[135] Researchers have suggested that some type of Web-based portal that gives the users up-to-date information about their health, which includes a messaging function, could potentially increase vaccination rates.[136]

The CPSTF recommends client reminder and recall systems as successful interventions to increase vaccination rates for a variety of reasons.[137] First, evidence that this intervention is successful is based on twenty-nine studies conducted from 1997 until 2012.[138] These studies show that client reminder and recall systems increase vaccination rates by a median of eleven percentage points.[139] When used alone, client reminder and recall systems increase vaccination rates by a median of six percentage points per client.[140] However, when coupled with another intervention, client reminder and recall systems increase vaccination rates by a median of twelve percentage points.[141]

Not only are client reminder and recall systems effective at increasing vaccination rates, they are also relatively cost effective to implement.[142] The CPSTF conducted an economic review on twenty-four studies with a median group size of 654 people and found that implementing client reminder and recall

132. *See id.* at 2540.

133. Anna Odone et al., *Effectiveness of Interventions That Apply New Media to Improve Vaccine Uptake and Vaccine Coverage: A Systematic Review*, 11 HUM. VACCINES & IMMUNOTHERAPEUTICS 72, 80 (2015).

134. *Id.*

135. *Id.*

136. *Id.*

137. *Client Reminder and Recall Systems*, *supra* note 127, at 1.

138. *See id.*

139. *Id.* This measure has an interquartile interval of four to seventeen percentage points. *Id.*

140. *Id.* This measure has an interquartile interval of three to thirteen percentage points and was measured in fourteen of the reviewed studies. *Client Reminder and Recall Systems*, *supra* note 127, at 1.

141. *Id.* This measure has an interquartile interval of ten to thirty percentage points and was measured in fifteen of the reviewed studies. *Id.*

142. *Id.* at 2.

systems costs a median of $2.13 per person per year, with a median cost of fifteen dollars per additional vaccinated person to implement.[143] This intervention's low cost makes it particularly suitable for combination with other, more costly, interventions.[144]

Implementing a client reminder and recall system as an intervention to improve vaccination rates is both effective and cost-efficient. Therefore, it is an effective strategy to reach a large number of individuals while using very few economic resources. State and local administrative agencies should consider implementing this intervention in their communities in order to improve vaccination rates.

A state or local health department would have the authority to implement client reminder and recall systems within its jurisdiction.[145] Although the authority of a state or local health department varies by jurisdiction, most state health agencies in the United States have the statutory authority to enact rules and regulations that "further their public health missions."[146] For example, in Washington State, local health departments have the authority to "[t]ake such action as is necessary to maintain health and sanitation supervision over the territory within his or her jurisdiction."[147] Client reminder and recall systems help "maintain the health and sanitation" of the state by increasing vaccination rates and thus lowering instances of vaccine-preventable disease.[148] Since the outcomes and goals of this intervention fall within the state or local health department's statutory authority, a state or local public health department would have the authority to implement it.

2. Provider Reminders

Another intervention state or local administrative agencies should implement in order to increase vaccination rates are provider reminders. "Provider reminders inform those who administer vaccinations that individual clients are due for specific vaccinations."[149] Provider reminders can be delivered by a variety of techniques including notes "posted in client charts, alerts in

143. *Id.* This measure has an interquartile interval of $0.96 to $8.00 and was measured in twenty-three of the reviewed studies. *Id.*

144. *Id.*

145. *See* Jennifer L. Pomeranz, *The Unique Authority of State and Local Health Departments to Address Obesity,* 101 AM. J. PUB. HEALTH 1192, 1192 (2011).

146. *Id.*; ASS'N OF STATE & TERRITORIAL HEALTH OFFICIALS, PROFILE OF STATE PUBLIC HEALTH: VOLUME 1, 28 (2009), https://www.astho.org/Profile/Volume-One/.

147. WASH. REV. CODE § 70.05.070 (2013).

148. *Id.*; *Client Reminder and Recall Systems*, *supra* note 127, at 1.

149. CMTY. PREVENTATIVE SERVS. TASK FORCE, *Increasing Appropriate Vaccination: Provider Reminders*, COMMUNITY GUIDE 1, 1 (Jan. 14, 2018), https://www.thecommunityguide.org/sites/default/files/assets/Vaccination-Provider-Reminders.pdf [hereinafter *Provider Reminders*].

electronic medical records, or letters sent by mail or email."[150] Studies show that all forms of provider reminders are effective in improving vaccination rates. However, a small subset of evidence suggests that standing orders are the most effective strategy "in improving vaccination rates in both inpatient and outpatient settings."[151]

Provider reminders with respect to vaccinations have traditionally been underused by pediatricians and public health clinics.[152] One of the ways that specific health care clinics can increase vaccination rates through provider reminders is to appoint a clinic employee to lead immunization improvement efforts.[153] This individual would be in charge of implementing the provider reminders as well as following up with patients after their visits to determine if the reminder is still needed.[154] This would likely be effective in a public health clinic setting.[155] Additionally, studies have found that health systems or clinics that believe their provider reminder system needs improvement that appoint an individual to improve their system tend to have higher increases in vaccination rates than systems or clinics that do not believe their provider reminder system needs improvement.[156]

Another way that health systems or clinics can implement provider reminders is to develop methods to identify children who may need vaccinations "at specific ages."[157] This could also include identifying children of certain backgrounds who may be at risk for not receiving proper vaccinations.[158] These children could be identified and have a special alert in their file so that vaccine administrators can take extra care to ensure each child receives vaccinations when they come into the office for visits.[159]

Although provider reminders can be used in a public health setting, there is some evidence that this intervention is most effective when it is used by primary care providers.[160] First, it is a "more efficient way to identify children and to target an entire population," as opposed to identifying children through other

150. *Id.*

151. *Id.*

152. Cheryl D. Tierney et al., *Adoption of Reminder and Recall Messages for Immunizations by Pediatricians and Public Health Clinics,* 112 PEDIATRICS 1076, 1081 (2003).

153. *Id.*

154. *See id.* at 1077.

155. *See id.* at 1078.

156. *See id.* at 1080.

157. Tierney et al., *supra* note 152, at 1081.

158. *See id.* at 1080.

159. *See generally id.* at 1081.

160. *See* Peter G. Szliagyi et al., *Reducing Geographic, Racial, and Ethnic Disparities in Childhood Immunization Rates by Using Reminder/Recall Interventions in Urban Primary Care Practices*, 110 PEDIATRICS 1, 5 (2002), https://pediatrics.aappublications.org/content/pediatrics/110/5/e58.full.pdf.

means such as risk factors or census-level outreach.[161] Second, targeted individuals tend to trust their personal doctor and may feel more comfortable with their personal doctor administering vaccinations.[162] By directing primary care providers to not only help identify individuals who have not received vaccines, but to also provide reminders to these individuals to administer the vaccine, more children will receive proper vaccinations.[163]

The CPSTF has found that provider reminders are effective in increasing vaccination rates.[164] The CPSTF analyzed twenty-eight studies which, together, show that provider reminders increase vaccination rates by a median of ten percentage points.[165] When used alone, provider reminders increased vaccination rates by a median of twelve percentage points.[166] Six of the studies analyzed by the CPSTF did not provide a "common measure for change in vaccination rates;" however, five of the studies provided "additional support" for using provider reminders.[167]

Not only are provider reminders effective in increasing vaccination rates—they are cost effective to implement. The CPSTF analyzed studies with a median group size of 2,910 clients.[168] The CPSTF found that provider reminders cost a median of seven dollars per person per year to implement with a "median cost per additional vaccinated person" of $309.[169] One way to lower the cost of provider reminders would be to use an immunization information system to generate automated provider reminders instead of a manual system.[170]

Provider reminders are, as stated above, an effective intervention for increasing vaccination rates. Due to their low cost of implementation, state and local administrative authorities should consider implementing provider reminders along with other interventions such as client reminder or recall systems in order to improve vaccination rates in their communities.

A state or local health department would have the authority to implement provider reminders within their jurisdiction.[171] State and local public health departments have the authority to enact rules and regulations that "further their public health missions"[172] and "maintain the health and sanitation supervision over the territory within his or her jurisdiction."[173] Provider reminders help

161. *Id.*
162. *Id.*
163. *See id.*
164. *Provider Reminders*, *supra* note 149, at 1.
165. *Id.* This measure has an interquartile interval of six to twenty-five percentage points. *Id.*
166. *Id.* This measure has an interquartile interval of six to twenty-five percentage points. *Id.*
167. *Provider Reminders*, *supra* note 149, at 2.
168. *Id.*
169. *Id.*
170. *See id.*
171. *See* Pomeranz, *supra* note 145, at 1192.
172. *Id.*
173. *See* WASH. REV. CODE § 70.05.070 (2013).

"maintain [the] health and sanitation" of the state by increasing vaccination rates and thus lowering instances of vaccine preventable disease.[174] Since the outcomes and goals of this intervention fall within the state or local health department's statutory authority, a state or local public health department would have the authority to implement this intervention.

3. Vaccination Programs in Schools and Organized Childcare Centers

Another intervention that state or local administrative agencies should implement to increase vaccination rates are vaccination programs in schools and organized childcare centers. Organized childcare centers include "non-home daycare, nursery or pre-school, and federal Head Start" programs.[175] Vaccination programs in schools and organized childcare centers are "multicomponent interventions" that are delivered onsite to improve vaccination rates.[176] "These programs include two or more of the following components: (1) immunization education and promotion, (2) assessment and tracking of vaccination status, (3) referral of under-immunized school or child care center attendees to vaccination providers, and (4) provision of vaccinations."[177]

In most states, laws that establish vaccination requirements for attendance at schools or organized childcare centers require "assessment, documentation, and tracking" specific to each vaccination.[178] This intervention either expands on the tracking or assessment process or conducts additional interventions.[179] It is best used along with collaboration between local health departments, health care providers, and the school or childcare center.[180]

Although this intervention can be implemented in both schools and organized childcare centers, implementing vaccination programs in an organized childcare center has a unique set of challenges. Unlike schools, most organized childcare centers "lack the resources, infrastructure, and staff to implement a vaccination program."[181] In order to use this intervention in an organized childcare center, it is likely that there would need to be a partnership between the local health department or clinic and the childcare center.[182] Additionally,

174. *Client Reminder and Recall Systems*, *supra* note 127, at 1.

175. CMTY. PREVENTATIVE SERVS. TASK FORCE, *Increasing Appropriate Vaccination: Vaccination Programs in Schools and Organized Child Care Centers*, COMMUNITY GUIDE 1, 1 (2010), https://www.thecommunityguide.org/sites/default/files/assets/Vaccination-Programs-at-Schools-Childcare-Centers.pdf [hereinafter *Vaccination Programs in Schools and Organized Child Care Centers*].

176. *Id.*

177. *Id.*

178. *Id.*

179. *Id.*

180. *Vaccination Programs in Schools and Organized Child Care Centers*, *supra* note 175, at 1.

181. *Id.* at 3.

182. *Id.*

unlike schools, organized childcare centers are typically "smaller, more diverse, and scattered," which reduces the likely efficiencies of on-site vaccinations.[183] On the other hand, since childcare centers are usually smaller than schools, personnel at these centers are more likely to have regular opportunities to interact with parents and caregivers, which may lead to a higher likelihood of success in obtaining consent for vaccination.[184]

One approach schools and organized childcare centers can use to increase consent for vaccinations is to conduct information sessions, administered by trained staff and professionals, about the vaccination programs that will be delivered at the school or organized childcare center.[185] It is important that these sessions be adapted to the specific needs or interests of the community in which the school or organized childcare center resides.[186] Additionally, these sessions have potential to lead to improvements in the way that the community as a whole views childhood vaccinations.[187] These sessions allow parents and caregivers to ask questions so that they feel they are fully informed about the vaccinations their child would receive and the potential benefits, as well as harms, that could come from the vaccinations.[188]

School and organized childcare center vaccination programs are highly effective in increasing vaccination rates.[189] The CPSTF found through twenty-seven studies that vaccination programs in schools and organized childcare settings increased vaccination rates by a median of forty-one percentage points.[190] Many of the studies examined included the administration of the influenza vaccine.[191] However, this intervention could also apply to other common childhood vaccinations. While this interventions could be implemented in any type of school or organized childcare setting, it would be best suited for "Head Start Centers, daycare facilities, and elementary, middle, and high schools in both rural and urban settings"—as they represent the populations most needing vaccination intervention.[192]

Not only are school and organized childcare center based vaccination programs effective, they may also be less expensive to administer than

183. *Id.*

184. *Id.*

185. Spring Chenoa Cooper Robbins et al., *School-based Vaccination: A Systematic Review of Process Evaluations*, 29 VACCINE 9588, 9597 (2011).

186. *See id.*

187. *See id.*

188. *See id.*

189. *Vaccination Programs in Schools and Organized Child Care Centers*, *supra* note 175, at 1.

190. *Id.* at 1–2. The interquartile interval of this number was fifteen to sixty-two percentage points. *Id.* at 2.

191. *Id.* at 2.

192. *See id.*

vaccinations administered in a health care setting.[193] School or organized childcare center vaccinations tend to have lower vaccine costs and eliminate the potential disincentive of expenditure that is associated with the child's health care facility visits.[194] Additionally, a child's vaccination can avert the potential "loss of parental income" that would occur if the child were to get sick due to not being vaccinated.[195] Although the cost of implementing school or childcare center based vaccination programs is unknown, it would likely be economically effective in the long run.[196]

Based on the evidence above, vaccination programs in schools and organized childcare settings are extremely effective in improving vaccination rates. Not only do these programs target children who are at risk for not receiving proper vaccination, but they also allow parents who consent to their child's vaccination to not lose any income due to the child's health care facility visits. State and local administrative agencies should consider implementing these programs in schools and organized childcare centers within their communities.

If this intervention were implemented in a school, a school board would have the authority to implement it within their school district.[197] This is because school board officers, in general, have authority over the "possession, care, control and management of the property and affairs of the school district."[198] Since vaccinating children attending a school is part of the "affairs" of the school district, the school board officials could implement this intervention.[199] Additionally, if this intervention were implemented in an organized childcare center, state and local public health departments would have the authority to implement it. This is because state and local public health departments have the authority to enact rules and regulation that "further their public health missions"[200] and "maintain [the] health and sanitation supervision over the territory within his or her jurisdiction."[201] Vaccination programs in organized childcare centers help "maintain [the] health and sanitation" of the state by increasing vaccination rates and thus lowering instances of vaccine preventable disease.[202] Since the outcomes and goals of this intervention fall within the state

193. *Vaccination Programs in Schools and Organized Child Care Centers*, *supra* note 175, at 2.

194. *Id.*

195. *Id.*

196. *See id.* at 2–3. However, the CPSTF recommends further research on the "economics" of these interventions. *Id.* at 3.

197. *See* WIS. STAT. § 120.12(1) (2017).

198. *Id.*

199. *Id. See also* WIS. STAT. § 120.12(16) (2017).

200. *See* Pomeranz, *supra* note 145, at 1192.

201. *See* WASH. REV. CODE § 70.05.070 (2013).

202. *Id.*; *Client Reminder and Recall Systems*, *supra* note 127, at 1.

or local health department's statutory authority, a state or local public health department would have the authority to implement this intervention.

4. Home Visits

A state or local administrative agency should also implement home visit programs in order to increase vaccination rates. Home visits programs can be conducted by vaccination providers, such as nurses, or community workers like social workers or community health providers.[203] During home visit programs, home visitors "assess a client's vaccination status, discuss the importance of recommended vaccinations, and either provide vaccinations to clients in their homes or refer them to available immunization services."[204] Home visits can be directed to all clients in a designated population or to those clients who have been unresponsive to the previous intervention efforts discussed in this Comment.[205]

Conducting a home visit program is highly effective in increasing vaccination rates for a number of reasons.[206] First, this intervention addresses many of the barriers and social determinants of health that may prevent a client from obtaining proper vaccination, such as lack of transportation or childcare.[207] Additionally, home visit programs should be especially effective if they are paired with another purpose, such as a well-child check for school.[208] This would provide the client with an additional reason, besides obtaining proper vaccination, for the home visit.[209]

The CPSTF found home visits to be effective in increasing vaccination rates.[210] Through a review of twenty-three studies, the CPSTF found that home visits increase vaccination rates by a median of eleven percentage points.[211] Further, the CPSTF found home visits are equally as effective when they are delivered to all clients as when they are only delivered to clients who were unresponsive to other vaccination interventions.[212] Additionally, the CPSTF found home visits that provide vaccination onsite and home visits that refer

203. CMTY. PREVENTATIVE SERVS. TASK FORCE, *Increasing Appropriate Vaccination: Home Visits to Increase Vaccination Rates*, COMMUNITY GUIDE 1, 1 (2016), https://www.thecommunityguide.org/sites/default/files/assets/Vaccination-Home-Visits_0.pdf [hereinafter *Home Visits to Increase Vaccination Rates*].

204. *Id.*

205. *Id. See also supra* notes 127–29.

206. Michael R. Isaac et al., *Can Opportunities be Enhanced for Vaccinating Children in Home Visiting Programs? A Population-based Cohort Study*, 15 BMC PUB. HEALTH 1, 10 (2015), https://bmcpublichealth.biomedcentral.com/track/pdf/10.1186/s12889-015-1926-8.

207. *See id.* at 8.

208. *See id.* at 2.

209. *See id.*

210. *Home Visits to Increase Vaccination Rates*, *supra* note 203, at 1.

211. *Id.* The interquartile interval for this measure is five to fifteen percentage points. *Id.*

212. *Id.*

clients to vaccination services outside of the home are both effective in increasing vaccination rates.[213] Finally, the CPSTF found that home visits alone as well as home visits coupled with other health intervention methods cause meaningful change in vaccination rates.[214]

While home visits are effective across many different populations in improving vaccination rates, home visits are costly to implement. The CPSTF, when analyzing a median group size of 575 individuals, found the median cost per person for each home visit was $56.30.[215] Because of its high cost, this intervention would be best paired with other, lower cost interventions such as provider reminders and client reminders and recalls.

Local officials should implement home visits for a variety of reasons. First, home visits are effective in reaching individuals who have not responded to vaccination interventions in the past.[216] This is important because these are the most challenging populations to reach when it comes to vaccination administration. Second, even though this intervention is costly, it has many benefits beyond just vaccination rate improvement, such as well-child checks and health education opportunities.[217] Children who have not received vaccinations may also be lacking in other forms of health care.[218] However, because this intervention is expensive, local officials should be cautious to only implement this intervention with clients who have been unresponsive to less expensive interventions.

A state or local health department would have the authority to implement home visit programs within their jurisdiction.[219] State and local health departments have the authority to enact rules and regulations that "further their public health missions"[220] and "maintain [the] health and sanitation supervision over the territory within his or her jurisdiction."[221] Home visit programs help "maintain the health and sanitation" of the state by increasing vaccination rates and thus lowering instances of vaccine preventable disease as well as promoting other health activities such as well-child visits.[222] Since the outcomes and goals of this intervention fall within the state or local health department's statutory authority, a state or local public health department would have the authority to implement this intervention.

213. *Id.*
214. *Home Visits to Increase Vaccination Rates, supra* note 203, at 1.
215. *Id.* at 2.
216. *Id.* at 1.
217. *Id.* at 1–2.
218. *See* Isaac et al., *supra* note 206, at 2.
219. *See* Pomeranz, *supra* note 145, at 1192.
220. *Id.*
221. *See* WASH. REV. CODE § 70.05.070 (2013).
222. *Id. See Client Reminder and Recall Systems, supra* note 127.

IV. CONCLUSION

Less than a month after a measles outbreak in Washington State, lawmakers proposed a bill to eliminate philosophical objections to vaccinations.[223] After the 2015 measles outbreak in California, lawmakers there did the same thing.[224] Nevertheless, without a major outbreak of disease, many lawmakers are not willing to pass laws that eliminate all non-medical exemptions to mandatory vaccinations due to the political nature of vaccines. Many lawmakers believe that passing laws of this nature will cost them too much politically in the long run. However, passing laws that eliminate all non-medical exemptions to mandatory vaccinations is not necessary to increase vaccination rates in a community or state. In fact, eliminating philosophical and religious exemptions from mandatory vaccination laws is not the most effective way to increase vaccination rates.

By implementing the strategies discussed throughout this Comment, more individuals will be protected from vaccine preventable diseases, even if they themselves are not vaccinated. These interventions will protect individuals with weakened immune systems who cannot safely get vaccinated. These interventions will also protect low-income children who typically have lower vaccination rates than their wealthy peers. These interventions will protect children living in rural areas where the closest doctor is miles away. Finally, these interventions will protect children, who through no choice of their own, never received vaccinations due to their parents' opposition. By taking the politics out of vaccinations and instead focusing on implementing interventions that are proven to be effective through extensive data, large-scale outbreaks similar to the ones in California and Washington can be prevented. If communities implement these interventions, America as a whole will be healthier and safer from vaccine preventable diseases.

KYLIE A. THOMPSON*

223. *See generally* H.B. 1638, *supra* note 4.

224. Silverstein*, supra* note 1; *California State Vaccination Requirements*, *supra* note 9.

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