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ABSTRACT

Background: According to the World Health Organization (WHO), vaccination has reduced the burden of infectious diseases to a significant extent. In recent times, however, the focus has been more on vaccine safety rather than effectiveness. As with any other public health program, immunizations and associated policies are designed to protect the health of the public. Compared to minor risks of side effects of vaccination, the risk of infection often rationalizes the use of vaccination. In states like Georgia, with fewer outbreaks associated with non-vaccination, the need to access community immunity remains constant. Though some articles have assessed parental refusal of childhood vaccination as an ethical concern, few have addressed the economic burden to society as a result of parental rights to refuse vaccination in the ethical contexts of rights, outbreak costs, and community safety.

Methods: A literature review was conducted on both qualitative and quantitative studies that described the ethical issues associated with parental refusal of child vaccinations. Electronic databases through PubMed and EBSCO search engines were examined for studies conducted between 2012-2018. Five reviewers independently assessed those articles for content and relevance.

Results: Forty-seven articles were identified by a subject matter expert and assessed by the five reviewers. Nineteen articles, based on relevance and theme were selected by consensus to include in this review. Article themes of “rights of parents,” “community rights,” and “costs associated with outbreak or mitigation of outbreak” were examined.

Conclusions: Ethical issues of community safety and costs of the outbreak, as well as the rights of the child, should be considered in the debate of childhood vaccination. Research, policy, and parental education strategies should also take ethical implications into account to encourage well-informed policy and parental decision-making.

Keywords: Vaccination, childhood immunization, parental refusal, ethics, consent

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INTRODUCTION

According to the World Health Organization (WHO), vaccination has reduced the burden of infectious diseases to a significant extent (2018). In recent times, however, the focus has been more on vaccine safety rather than effectiveness (Andre et al., 2008). Strides in vaccination rates have been made in modern history; however, low rates of disease do not mean that threat of outbreak should not be monitored consistently. Though the immunization section of the Georgia Department of Public Health (GADPH) states that vaccine-preventable disease levels are at or near of record lows, the presence of under-immunized and unimmunized individuals could place any state at risk of potential outbreaks of disease.

The concept of herd immunity describes when a sufficient portion of the population is vaccinated against an infection and as a result, the population becomes resistant to the spread of that particular disease (Fine, Eames, & Heymann, 2011). To consider the effectiveness of a childhood vaccination, one must first assess the severity of the disease

against which vaccination is used and determine the probable harm to the individual. Secondly, for prevention of the disease, the vaccine should be examined, both at the individual and community level (Verweij & Dawson, 2004). This is indicative of the importance surrounding parental vaccination decisions. Both the individual and society benefit from more immunized individuals making up the community when compared to less.

Concerns about safety and effectiveness arise in all individuals considering vaccination but scrutiny is placed on children's vaccinations and thereby, their parents' rights to refuse them. Parents refuse to vaccinate their children for several reasons to include: religious reasons, personal beliefs or philosophical reasons, safety concerns, and a desire for more information from healthcare providers (McKee & Bohannon, 2016).

BACKGROUND

There are potentially negative consequences associated with vaccination. Vaccinations are medications and can place children at risk of side effects. According to the CDC, most

cases of side effects (often issues like redness and/or swelling at injection site) are considered mild (2017). There is also a small chance (1-5% of vaccinated children) that the child may not develop an immunity to the disease and still experience symptoms of the disease if exposed (2017).

Compared to minor risks of side effects, the risk of infection often justifies the use of vaccination. Four variables usually govern risk magnitude: the nature of the illness, the associated link between the local epidemiological and environmental characteristics; the possibility of transmission; disease duration and its severity (WHO 2018). Vulnerable populations, like children, are biologically more susceptible to vaccine-preventable diseases than others (CDC, 2017). When parents refuse to have their children vaccinated, they expose them to vaccine-preventable diseases.

There are no federal mandates associated with immunization consent. Such guidelines are left to state and local governance. In order to improve the health of the nation, states in the United States have mandated certain compulsory vaccinations. This has become protocol for the protection of people against certain diseases, such as meningococcal meningitis and measles. As with any other public health program, immunizations and associated policies are designed to protect the health of the public (CDC, 2017). When a course of action is mandated, however, certain ethical issues can often arise. If there are two ways to solve a problem, the ethical decision is to choose the option that does not violate the individual's moral right, like privacy and justice (Kass, 2001).

The state of Georgia makes provisions for immunizations. The Georgia code CHAPTER 511-2-2 contains the requirement for immunization for the state of Georgia. A Certificate of Immunization (Form 3231) is required for all children through grade 12 in Georgia and includes children attending any childcare facility, pre-kindergarten, Head Start program, nursery, or school. This includes public and private operations and all enterprises, educational programs and institutions involved in the care, supervision, or instruction of children.

Although, in the State of Georgia, exemptions are approved for vaccination to include exemptions on religious grounds and in some case medical exemptions, if the "Department or a County Board of Health determines that an epidemic or the threat of an epidemic exists, the Department or Board shall immediately notify the governing authorities of all schools and childcare facilities within the affected area. Under those circumstances, the Department or Board may require immunization for those who object on the grounds of religious beliefs and may prohibit attendance at schools or childcare facilities within the area by unimmunized children" (GADPH, 2018). It is essential that the most vulnerable subpopulation within society, infants and children, be monitored with regard to their immunization status. This is why the state collaborates with all local health districts to conduct the Georgia Immunization Study. The purpose of this study is to assess immunization

coverage rates of two-year-old children within each of the eighteen health districts.

The purpose of this analysis is not primarily to examine why parents do not vaccinate their children but to examine the ethical implications of their refusal based on the effect on mitigating an outbreak, the children's rights, and the safety risk placed on the community. When vaccination is directed towards children, the question arises whether the parental autonomy provides enough authority to preclude immunization when prescribed by healthcare authorities. Parental responsibility necessitates making decisions in the best interest of the child. In the case of community health vs individual rights, the adverse effects of the vaccine are usually minimal for those individuals who endure being vaccinated despite the low incidence of the disease (Bradley, 1999). It is documented that adverse effects associated with vaccination are minimal. Indeed, devastating outcomes resulting from a lack of childhood immunization at the population level have been well documented. Scientific evidence as to the benefits of immunization should be provided at the community level, in an effort to educate community residents with attention to appropriate health literacy levels. This mandate strengthened by evidence would place the public at ease when it comes to childhood immunization and more children would undergo vaccination (King, 1999).

There are multiple factors that must be considered when determining the ethical consequences of non-vaccination. For the purpose of this analysis, those identified factors would be the cost of a disease outbreak, community safety, and the rights of the child.

- **Cost of disease outbreak** – Outbreaks can occur with one or more infected person(s). These public health emergencies can easily snowball from being an endemic situation to an epidemic, and eventually, a pandemic situation. The cost of curtailing an outbreak due to non-vaccination has direct monetary costs and can increase the incidence of preventable diseases (Moser, Reiss & Schwartz, 2015). This associated cost is a burden, often taken out of publicly funded sources. Because these events are unplanned and costly, often resources are diverted from other needs; this reduces the funding to support other important public health programs and aims (Moser, Reiss & Schwartz, 2015).
- **Community safety** – This term is concerned with the safety of the community as a whole around unvaccinated members. Are members of the community unnecessarily exposed to a preventable disease? As the CDC states, immunization laws are in place not only to protect an individual child but all children (2017).
- **Right of the child** - Many individuals believe that children have certain rights. Are vaccinations infringing upon the right of the child? Is the decision really in the best interest of the child considering the possibility of the child dying if infected by some of the vaccine-preventable diseases?

SIGNIFICANCE

In the case of mandatory vaccination, the rights of parents and children need to be considered but are not the only factor. It is the ethical duty of healthcare professionals to obtain the consent of parents before initiating any medical intervention in protection of the child. It is also the duty of the public health community to educate local communities on the ethical issues associated with vaccinations. By immunizing school children, public health or healthcare professionals seek to ensure societal conditions under which people can lead healthier lives, minimizing threats to our health “that can be averted or lessened only through collective actions aimed at the community (Kaas, 2001). Identifying the ethical implications of parental refusal to vaccinate children will provide context for public health policy and describe the role ethics plays in understanding the costs associated with outbreak containment, community safety issues with reference to herd immunity, and rights of the child with exposure to vaccine-preventable diseases.

METHODS

The Georgia Southern University Institutional Review Board approved all protocols for this review. A literature review was conducted on both qualitative and quantitative studies that described the ethical issues associated with parental refusal of child vaccinations. Electronic databases

through PubMed and EBSCO search engines were examined for studies conducted between 2012-2018, using the following search criteria in title and body of the article broadly: “vaccination” or “outbreak cost” or “right of child” or “right of minor” and “ethics” or “ethical” or “good of the people” or “herd immunity” or “community” or “parental refusal” or “public health”. Only peer-reviewed journal studies, written in English were included. Relevant articles and themes were identified by one reviewer and Subject Matter Expert (SME). Five reviewers independently assessed those articles for content and relevance. These reviewers also categorized articles into three identified themes: “rights of the child,” “community rights,” and “costs associated with outbreak or mitigation of outbreak.”

RESULTS

Forty-seven articles were identified by the SME and assessed by the five reviewers (Figure 1). Nineteen articles, based on relevance and theme were selected by consensus to include in this review. Purpose, Methodology, Sample Description, Key Findings, Theme/Question Answered and Limitations were extracted from each article. Two of the nineteen articles explored the cost of outbreaks. Seven of the nineteen articles explored the rights of the child. Finally, ten of the nineteen articles explored community safety. One should note that five articles incorporated two of the analytical themes which were community safety and rights of the child. Most (10 of 17) of the articles were qualitative in nature. The remainder were quantitative (7 of 17).

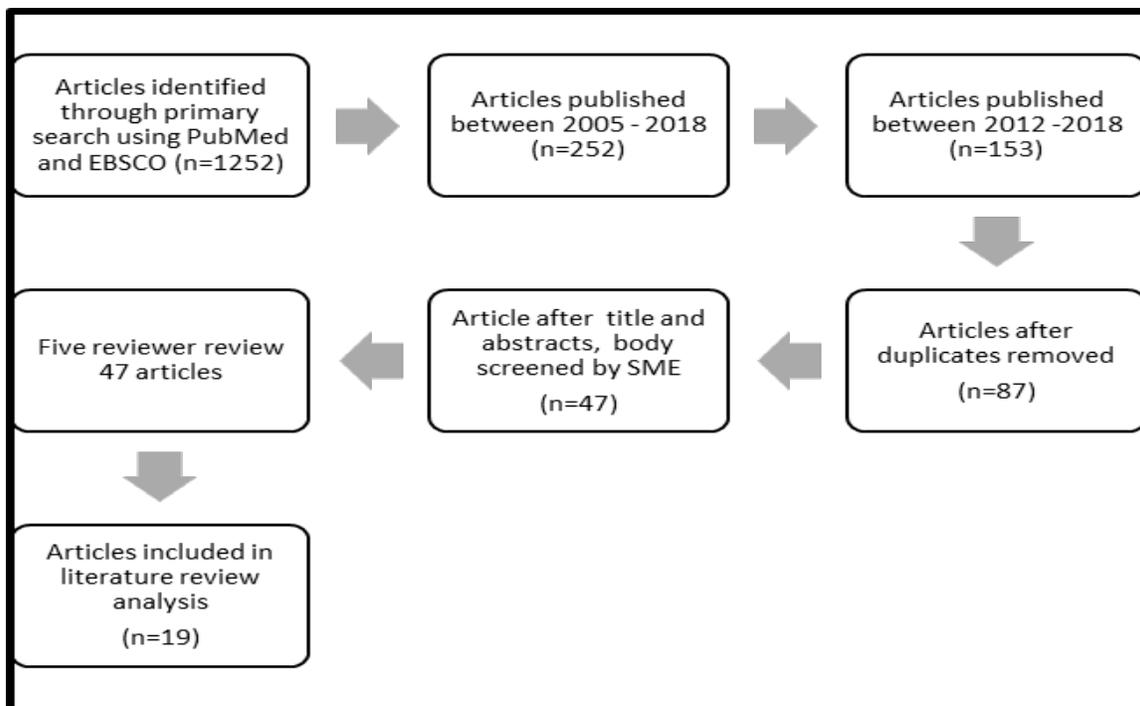


Figure 1. Review of search and selection algorithm

Cost of disease outbreak

The two articles that explored the cost of outbreak mitigation both agreed that considering the cost of containing an outbreak to the society, the government should consider making exemptions share some of the

economic burden imposed on the population (Constable et al., 2014; Moser et al., 2015). Constable, Blank & Caplan (2014) described the economic impact of a healthcare-associated measles outbreak in two hospitals was placed at \$799,136 in 2008 and the recent measles outbreak in San

Diego because of exposure to an intentionally unvaccinated child was \$10,376 per measles case. Therefore, to make the decision to not vaccinate more equitable for society, those who choose to forgo vaccination should be faced with a fine to “offset” the potential cost to the society from which they enjoy herd immunity (Silverman & Wiley, 2017).

Community safety

Ten of the nineteen articles explored community safety and the concept of vaccines’ ability to promote herd immunity. Across all of the articles selected themes of outbreak prevention and vaccination maintenance were recurrent themes (Aita & Ragland, 2015; Barraza et al., 2013; Bucchieri 2016; Buttenhei et al., 2013; El Amin et al. 2012; Diekema, 2014; Hendrix et al., 2014; Moser et al., 2015; Silverman & Wiley, 2017; Wang et al., 2014). All ten articles presented that vaccinations have proven to be effective in eradicating numerous disease outbreaks, largely due to maintenance of herd immunity. Two of the ten studies (Diekema 2014; Hendrix, Sturm, Zimet, & Meslin, 2016) expressed that though there are some schools of thought believing that a few non-vaccinated children are not enough risk for the likelihood of an outbreak, these risks are ultimately dependent on some other underlying factors that include the infectiousness of the disease, effectiveness of the vaccine and degree of contact between individuals in the community. Several of the articles addressed the issue of herd immunity providing coverage for those not vaccinated but also pointed to the fact that herd immunity thresholds vary by disease and coverage can be precarious. As Diekema (2014) points out, for non-vaccinated children, there is a 9-fold increased risk of contracting chickenpox, a 23-fold increased risk of contracting pertussis, and there is a 35-fold increased risk of contracting measles.

One study made reference to what is known as Hardin’s iconic 1968 “Tragedy of the Commons” and uses it as an analogy that it is a common good to the society if its population are appropriately vaccinated against highly infectious diseases and maintaining this common good requires that all vaccine-eligible individuals be vaccinated (Hendrix, Sturm, Zimet, & Meslin, 2016). In considering community safety some physicians exclude patients from their practices for not adhering to the recommended vaccines (Hendrix, Sturm, Zimet, & Meslin, 2016; Silverman & Wiley, 2017). In 2013, approximately 1 in 8 excluded such patients which was a twofold increase from 2007 (Silverman & Wiley, 2017). Such tactics may be necessary to attain the 96-99% compliance needed to achieve ideal state for herd immunity when it comes to measles (Hendrix, Sturm, Zimet, & Meslin, 2016).

Though many policies have been promoted to combat exposure and encourage child vaccinations in the community, many options have been found not to work. For example, Buttenheim, Cherng, & Asch (2013) discovered that practices that dismiss hesitant patients increase risks at other practices, produce higher concentrations of unvaccinated children, increase exposure, and increase the proportion of patients unable to find pediatricians.

Rights of a child

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Seven of the nineteen articles (Barraza et al., 2013; Bucchieri 2016; El Amin et al. 2012; Diekema, 2014; Ma and Stahl, 2017; Sadaf et al., 2013; Silverman & Wiley, 2017) explored the rights of the child in juxtaposition to safety of the community in which they live. The articles present the understanding that childhood vaccination is a key intervention against the spread of dangerous diseases and children and the communities they live in are protected when they are vaccinated against a potentially serious infectious disease. However, fear of harm from vaccines has been and will continue to be a significant reason stated by parents/guardians for refusing vaccinations for their children. The public’s concerns regarding vaccine safety must be considered in the context of the public’s awareness of the seriousness and risk of acquiring a particular vaccine-preventable disease.

Though there is a need to protect individual rights, Diekema (2014) pointed out that several court rulings have established that religious freedom does not allow the endangerment of others including either the public’s health or the health of one’s child: “The right to practice religion freely does not include the liberty to expose the community or the child to communicable disease or the latter to ill health or death”. The state may have paternalistic interest in protecting the children over their parent’s objections (Silverman & Wiley, 2017).

DISCUSSION

Relevant findings from this review are:

1. Parental refusal towards vaccinations highlights concerns which place individual and community-level health status at risk.
2. The most highly recommended strategy was parental education, which includes using promotional strategies to educate parents about repetitive vaccine usage for health maintenance and improvement will give a clearer insight into their benefits.
3. Educating parents on the costs of decreased vaccination and the concept of herd immunity could also be a strategy, with each strategy assessed based on community traits.
4. Working in sync with health care providers to inform patients may be the best strategy for sustained compliance.
5. Effective communication and education strategies can be designed that inform parents not only of the scientific implications of vaccines but include discussions on ethical implications of refusal to vaccinate as well.

Childhood vaccine administration, in general, is an intricate interplay of many operations, creating variances at the individual, community, organizational, and political levels. As mentioned earlier there are no federal laws governing childhood immunizations and monitoring and enforcement falls to the individual state. As an example, the state of Georgia through the immunization program does this by regularly conducting the yearly immunization study. The 2016 immunization report for Georgia state reported that for reasons of incomplete vaccination, parents choosing to

delay vaccination ranked second, parental refusal ranked third, while missed appointments/convenience issue ranked first.

Furthermore, among the articles assessed for data collection, one common principle applied and remained in effect- state governance through policies and programs. Government agencies play a key role in preclinical development to postoperative monitoring in ensuring that vaccinations remain one of the greatest public health interventions. Preventive efforts at all levels help to ensure the ability to reduce and control outbreaks, while systematically minimizing financial costs. Parental refusal towards vaccinations has ethical implications for both child and parental autonomy in terms of discretionary decision-making. While parents preserve their right to decide whether their child receives vaccinations, not doing so contraindicates this need, placing other members of society at risk.

As maintained throughout the articles researched, there are specific guidelines which dictate these ethical decisions when certain circumstances arise. For example, in the case of compulsory vaccinations-all U.S. states require that children become vaccinated in order to attend public school and some states provide exemptions based on religious, moral, or philosophical beliefs, only two states-Mississippi and West Virginia allow only medical exemptions (Constable, Blank, & Caplan, 2014). While no federal law is imposed requiring all children to become vaccinated as mentioned in the research articles, state law maintains that children become vaccinated against diphtheria, tetanus, polio, pertussis, and measles and rubella, sustaining herd immunity for these diseases. The issue of herd immunity remains a hot topic and thus the Healthy People 2020 objectives set targets which states strive to ensure they meet. Currently, the state of Georgia, based on the last immunization report for 2016, has met the set target for MMR and Polio, has not met the target for Hepatitis B and Varicella. To maintain the target, monitoring and continuous education on the benefits of vaccination will have to continue to ensure that the target remains as is and only then will the state be able to remain outbreak free. When dealing with vaccination campaigns, the public's fear must be mitigated to eventually reverse the lowering rates. Parts of the arsenal to correct the issue are commercial and social marketing practices (Nowak, Gellin, MacDonald, and Butler, 2015).

In this review, there are some notable limitations. Each article's limitations should be taken into consideration as well as this literature review's selection and consensus process. Study selection bias- in which subsequent data analysis is conducted in such a way that is not representative of the population is also possible. Articles of relevance also had the potential to be left out of the selection and review process as only recent publications were selected. Additionally, articles might have appeared in the non-published grey literature and these too would have been eliminated.

CONCLUSION

Preventive care is the cornerstone of public health. Childhood vaccine policy administration has many controversies but from a public health perspective, it is often considered the best approach towards mitigating diseases. Though there are still skeptics of the consequences, most of the healthcare community assert that vaccinations, including childhood vaccinations, have benefits that far exceed their costs. Vaccines play important roles in establishing herd immunity-the minimum threshold necessary to protect the community by providing outbreak prevention and maintenance.

The onus to protect members of society falls on both the community governance and to the individuals that make up the community. Repercussions of epidemics create both resource and individual costs as well as jeopardize community safety. This does not mean that individual rights of the children and the considerations that parents make to uphold these rights should not be considered. On the contrary, more understanding is needed to ease concerns and defend children's rights while still protecting herd immunity and community policies and norms. Changing from a scientific-based community outreach and messaging strategy to a mixed method of both scientific and ethical focused outreach may be one effective strategy to enhance community knowledge and engagement in childhood vaccinations.

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