**Delivering Childhood Immunization in Schools: A Systematic Review of Implementation in Low- Income Community**

**The title has been updated into Delivering Childhood Immunizations in Schools: A Systematic Review of Implementation in Low-Income**

**Setti**

**ABSTRACT**

**Background:**

Immunization is important in promoting child health in the Philippines. Ensuring Delivery of vaccination to low income community is beneficial to promote overall health of the children. In the Philippines, Despite efforts, achieving a 95% immunization coverage for children between 2010 and 2021, vaccine coverage rates declined. The school is great opportunity to provide information for the children and a place to conduct essential program for immunization. School has shown great impact in the delivery of immunization on low-income communities. The school provide venue in providing vaccine to reach large number of children. The essential program includes routine and boaster immunization, Children who are unvaccinated and vaccination outcome that cater specifically in low-income community. Despite success in the delivery of services, challenges that usually occur such as manpower or staff, vaccination supplies, and information delivery to the parents of the students. School base immunization essential program, include immunization for human papillomavirus (HPV), meningococcal, routine dose for tetanus-diphtheria, measles and polio. It shows that vaccination in low income community impact the public strategies to improve immunization coverage.

**Purpose:** The objective of this study is to identify factors that promote successful delivery and create program that will enhance the capacity to foster partnership of school health in improving health strategies in the low income community. The intervention to strengthen the delivery and provide reliable sources of information in the benefits of immunization. With school health and parents’ role toward delivery of information in the importance of immunization in child’s health.

**Result:** A total of 12 articles were identified, essential immunization program in school health setting was conducted in the process evaluation. The immunization of school entry or during school is essential in factors in vaccination implementation.

The programmed management in low income community. The work force capacity which focus on collaboration of parents, students and school health nurse towards achieving immunization positive outcome toward child health.

**Conclusion:** The study review provides critical analysis in the concepts of immunization for the children. This serves as support in in creation of strategic ways in promoting delivering childhood immunization in low income community. Implementing effective delivery establish overall child health. School and community had establish strong monitoring to improve immunization delivery. The availability of services and work force capacity tailors in monitoring programmed. Collaboration with parents, students and school nurse foster foundation in vaccination programmed in school-based setting. The delivery of information on immunization have impact in promoting child health. The study underpinned robust theory informed research to help development of essential programed.

**Keywords***: childhood, delivery of immunization, school health, low income,*

**1.0. Introduction**

Immunization is important in promoting child health in the Philippines. Despite efforts, achieving a 95% immunization coverage for children between 2010 and 2021, vaccine coverage rates declined. Outbreaks of measles and polio in 2019 further highlighted the vulnerability of children. In 2019, the World Health Organization recognized vaccine hesitancy as a significant global health concern. Factors such as complacency and doubts about efficacy contribute to this hesitancy (Migriño et al., 2020). Several challenges, including financial limitations, societal indifference, vaccine hesitancy, that, hinder optimal immunization. Cordero,(2024) The Philippines ranked fifth globally for its "zero-dose" child population and seventh for children at risk of measles due to inadequate vaccination reducing cases from 1 million in 2021 to 163,000 in 2023. (UNICEF Philippines, 2022) .In 2024, DOH reinstated Bakuna Eskwela, a school-based immunization program offering vaccines for measles, rubella, tetanus, diphtheria, and HPV. The delivery of immunization is one way to combat challenges and to reach large number of children to acquire vaccination. The school is great opportunity to provide information for the children and a place to conduct essential program for immunization. School has shown great impact in the delivery of immunization on low-income communities. The school provide venue in providing vaccine to reach large number of children. The evidence shows that school base immunization is effective with high completion rate. Perma, et.al. (2017). Low- and lower-middle-income implement some school-based vaccination. This includes assessment in school based survey to determine largest portion such as ages 4–7 years or ages 12–15 years. LaMontage, et.al.(2017)

 The evaluation on the delivering childhood immunization in the low income community is beneficial in the immunization coverage. Intervention to strengthen the health system must ensure immunization reliably and locally available.The essential program includes routine and boaster immunization, Children who are unvaccinated and vaccination outcome that cater specifically in low-income community. Despite success in the delivery of services, challenges that usually occur such as manpower or staff, vaccination supplies, and information delivery to the parents of the students. School base immunization essential program, include immunization for human papillomavirus (HPV), meningococcal, routine dose for tetanus-diphtheria, measles and polio. Assessing the capacity to conduct immunization in school base setting is essential in the health system. Undertaking readiness assessment in countries improve to identify school vaccination activities. World Organization (2024). The children immunization in achieving success is through support by parents through consent that bring parent consent and voluntarily bring children to be vaccinated in the health clinic.

The delivery program on school immunization cater to help the low income community to achieve child health. The aim to identify factors that promote successful delivery and create program that will enhance the capacity to foster partnership of school health and low income community to improving health strategies and increase immunization coverage. The intervention to strengthen the delivery and provide reliable sources of information in the benefits of immunization. With school health and parents’ role toward delivery of information will enhance the capacity to address barriers and increase demand in the immunization in child’s health

.**2.0. Methodology**

To maintain a balanced and thorough examination of research, this review adheres to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. Developed by Moher et al. (2009), PRISMA offers a robust framework for identifying, screening, and including studies in a systematic review, thereby enhancing the review's quality and reliability (Liberati et al., 2009). By adhering to the PRISMA framework, the study have been able to meticulously screen and select only the most pertinent and highest-quality studies for our analysis. (Figure 1). The systematic review base on delivery of immunization in school base setting. This action strategies in enhancing child health in low income community. In order to understand the factors that influence on the delivery of program. The eligibility of criteria were studies that (1) delivery of childhood immunization in school;(2)factors that affect preparation or delivery ,(3) conducted in low income community (4) undergo peer reviewed. The articles searched published between 2018- 2015 using electronic data base. The extracted data from the studies has undergo quality and risk assessment bias and categorized the finding using thematic framework.



Fig 1. Data gathered utilizing PRISMA Diagram

Initially, a total of 100 records were identified through a comprehensive search using the database from National Library of Medicine, Google Scholar, Science Direct, PLOS and other databases, with the aim to gather a wide range of potentially relevant studies. Keywords such as "school health immunization,"” role of school healthcare providers in immunization," and " immunization programmed" were utilized to capture the most pertinent literature. During the screening process, 50 of these records were examined in more detail, with 17 being excluded due to irrelevance to the research question or lack of necessary data. The remaining 33 reports were then sought for retrieval, leading to a further assessment of 12 for eligibility based on predefined criteria, which included the study’s relevance to the research questions, methodological soundness, and data completeness.

The appraisal process was thorough, with each study being evaluated for its contribution to understanding the barriers to immunization in low-income communities. Factors such as the study design, context, population, and outcomes were considered. After this careful consideration, 12 studies were included in the final review for their direct relevance and high-quality data. This process ensured that the findings of this systematic review are based on the most relevant and robust evidence available.

**3.0 Results and Discussion**

Numerous studies were thoroughly examined to identify factors and delivery to promote program in school immunization. Through a range of research methods—including qualitative interviews and meta-analyses—these studies offer valuable insights into the complexities and possibilities surrounding immunization initiatives in different contexts. This section aims to synthesize these diverse findings, pinpoint common themes and variations, and explore. Through a comparative analysis, key insights are highlighted that could inform future research and policymaking that enhance child health.

Table 1. General Characteristic of the Reviewed Studies

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Author’s & Year | Aim | site | Methodology/ Data collection/Data analysis | Result |
| Bethke, et.al. (2024) |  This study examines the effectiveness of a city-wide school-based educational vaccination intervention as part of an on-site vaccination program aimed at increasing MMR and Tdap-IPV vaccination rates versus on-site vaccination alone among sociodemographically diverse students  | Berlin, Germany |  The study was a 1:1 two-arm cluster randomized controlled trial, with schools randomly assigned to either the Educational Class Condition (ECC) or the Low-Intensity Information Condition (LIIC). Both received an on-site vaccination program, while students in the ECC received an additional educational unit.  | Findings suggest that educational, school-based on-site vaccination appears to be a promising strategy for increasing vaccination uptake in adolescents. |
| Brohman, et.al.(2024) |  The objective of this qualitative study was to identify opportunities for HPV vaccine education by exploring the perspectives of students, parents, school staff, and public health nurses on the current SBIP. | British, Columbia | Individual semi-structured interviews were conducted with adult participants and focus groups were conducted with grade 6 students between November 2019 and May 2020. The interviews and focus groups were transcribed and then analyzed using reflexive thematic analysis | Opportunities for HPV vaccine education were identified in three themes: 1) making SBIPs student-centered; 2) adopting a collaborative and interdisciplinary approach to vaccine education; and 3) actualizing parent education opportunities |
| Braumbaugh, et.al. (2024) | In this study, we sought to understand patterns of childhood across socioeconomic. To identify interventions that improve immunization equity and inform public health practice. | USA | The researcher utilize explanatory sequential, mixed methodology. immunization data were analyzed to understand trends in immunization coverage. Qualitative interviews with public health and community leaders were used to explain trends, gain insight into routine childhood immunization interventions, and understand local contexts and data limitations. | Public health leaders identified key interventions that effectively improved vaccine equity and coverage, including data quality improvement, tailored interventions for specific populations, multisector partnerships, addressing common barriers, and data limitations. Participants also identified the critical role of state policies, public health funding, and community vaccine norms. |
| Gallant, et.al. (2024) | The objectives of this study were to explore 1.) stakeholders' experiences with SBIP and changes to programs. School-based immunization programs (SBIP) support access to routine vaccines for adolescents. | Nova Scotia, Prince Edward Island and New Brunswick | Semi-structured interviews with [decision makers](https://www.sciencedirect.com/topics/social-sciences/decision-maker), healthcare providers, teachers, parents and adolescents between February–August 2023. The COM-B model and Theoretical Domains Framework informed interview guides. | Participants (n = 39) identified five themes: 1) enablers to SBIP delivery, 2) barriers to SBIP delivery, 3) desired changes to SBIP delivery, 4) student anxiety. Public health measures facilitated more space for clinics, as did taking smaller cohorts of students. School staff-healthcare provider relationships could help or hinder programs.  Adolescents played a passive role in vaccine [decision making](https://www.sciencedirect.com/topics/social-sciences/decision-making), with mothers often being the sole decision maker. |
| Kim, et.al. (2022) |  to identify appropriate interventions to address the reduced magnitude of vaccination coverage. The SVCP checks the completion status of the [vaccination schedule](https://www.sciencedirect.com/topics/immunology-and-microbiology/vaccination-schedule) for students upon their entry into elementary or middle school. | South korea  | examined and quantified the relationship with SVCP and the vaccination uptake by comparing the vaccination coverage of 2021 and 2022. Based on the standard schedule, the vaccination records of DTaP5, IPV4, MMR2 and IJEV4 were evaluated for elementary school students. | The study found that the SVCP was effective in increasing vaccination coverage for targeted vaccinations such as DTaP5, IPV4, MMR2 and IJEV4 for elementary school students, and Tdap6, IJEV5 for middle school students. However, the SVCP did not show a statistically significant effect on increasing vaccination coverage on HPV1 for middle school students. School can play an important role to improve vaccination coverage.  |
| Lakusa et.al. (2018 | low coverage is poor parental knowledge of the importance of completing vaccination schedules. We therefore assessed the effects on childhood vaccination coverage, of educating parents and other persons assuming the parental role | N/A | six eligible randomized trials with 4248 participants. |  Combining the data shows that these interventions lead to substantial improvements in childhood vaccination coverage (relative increase 36%, 95% confidence interval 14% to 62%). There was no difference between the effects of community-based and facility-based education. Therefore, education in communities and health facilities on the importance of childhood vaccinations should be integrated into all vaccination programmes in low and middle-income countries; accompanied by robust monitoring of impacts and use of data for action. |
| Leidner, et.al. (2021) | The objective of this study was to gain an understanding of the types of school-level vaccination activities that occur at schools, with an interest in better understanding factors that may contribute to differences in vaccination coverage, clusters of under vaccinated students, and with implications for parental and community attitudes about vaccinations. | USA | NASN and CDC developed a school-level immunization practices questionnaire to survey a convenience sample of kindergarten school nurses across the United States. The survey questions were initially developed by the authors.  |  A total of 41% of school nurses worked with external partners for vaccination efforts, the most common support received from partners being vaccine administration (38%) and providing materials/vaccines (21%). School nurses also reported that 95% of kindergartners were up to date for all vaccines. School-based vaccination-related activities are essential to sustaining high levels of vaccination coverage for the protection of children at schools and in the broader community. |
| Musuka, et.al.(2025) | Understanding the factors compromising vaccine equity for these children is critical to reducing zero-dose prevalence and improving health outcomes. | N/A | This scoping review examined peer-reviewed, gray literature from 2010 to 2024. Searches were conducted in PubMed, Google Scholar, and relevant organizational reports (WHO, UNICEF). | Factors such as education, logistical support for vaccination settings were consistently linked with better outcomes. Effective strategies included school-based immunization programs, and robust community engagement to address stigma. Lessons learned underscored the importance of flexible, individualized care plans and empowering families through transparent communication. |
| Parsekar,et.al.(2024) | The study focus On vaccination delivery in low and middle income that present summary to improve routine immunization program. | India, Indonesia and Pakistan | The study utilized experimental quasi experimental on evaluating effectiveness of intervention and immunization routine for the children. The outcome also includes systematic review. A total of 142 were included in the summary of the study | The result shows that barriers in vaccination affects in the effectivity of the program. To combat this, improving vaccination through enhancement in the delivery which include place, time and schedules. Interventions include improving services, training and education of school health nurse and other health workers. |
| Perman, et.al.(2017) | Understanding the facilitator and barrier in the improving delivery of future school health base vaccination program. | USA | Systematic review was conducted in school-based vaccination programs.  | The result shows thatactors included programme leadership and governance, organisational models and institutional relationships, workforce capacity and roles particularly concerning the school nurse, communication with parents and students, including methods for obtaining consent, and clinic organization and delivery. |
| Shattock, et.al. (2024) | The study aim to quantify public impact of expanded program for immunization and its impact in the program inceptions. | Africa Region | This was modelling study that utilized mathematical and statistical models to estimate the global and regional public health impact  | vaccination has averted 154 million deaths, including 146 million among children younger than 5 years of whom 101 million were infants younger than 1 year. |
| Ulep & Uy (2021) | The program hasthe critical objective of providing Filipino children with access to safe and effective vaccinesthat will protect them from diseases like measles, diphtheria, tetanus, and whooping cough. | Philippines | The researchers utilize narrative review and evidence base practices as approach in the study. | The Philippine Expanded Program on Immunization (EPI) has been in existence for almost 40years. It is one of the major programs of the Department of Health (DOH). assess the performance of the EPI in the Philippines. demand factors like vaccine confidence have contributed to the weak performance ofthe program, the sharp decline in immunization coverage is largely a result of deep-seatedsupply-side systems issues related to leadership, planning, and the supply chain that has led torecurring vaccine stock outs in the past decade. |

**3.1. Immunization Status at entry or during school**

Immunization status check is important in the policies to enter school. This includes routine in practice in checking status of children that helps to promote childcare. The school vaccination checked program help to achieve the immunization program. The integrated system partnership to school to access the vaccination status of students that enters in the elementary. This access is important to notify the parents on the status of vaccination of the children. This also informed parents on schedules of vaccination or missed vaccination. Maintaining high level of routine immunization important in promoting quality of health of the children. School vaccination program is effective in increase protection of the children.

 The program targets specific vaccinations such as the second dose of the measles-mumps-rubella vaccine (MMR2), the fifth dose of the diphtheria-tetanus-acellular pertussis vaccine (DTaP5), the fourth dose of the [inactivated polio vaccine](https://www.sciencedirect.com/topics/medicine-and-dentistry/poliomyelitis-vaccine) (IPV4), and fourth dose of inactivated [Japanese encephalitis vaccine](https://www.sciencedirect.com/topics/medicine-and-dentistry/japanese-encephalitis-vaccine) (IJEV4) for elementary school students. Kim et.al. (2023). The schools play important role in global strategic plan to eradicate measles and rubella which commonly affects the children.

**3.2. Programmed management in the low income community**

 Program that cater the immunization delivery through school health setting in the low-income community is essential in promoting child health. Planning is important in the coordination of the effectiveness of delivery. Reducing distance of immunization services are necessary in strengthening the immunization coverage. In the Philippines program such as “Bakuna Eskwela” to revive the school based immunization against diseases that can be prevented. DepEd(2024). This program focus on immunization for measles, rubella, diphtheria, tetanus and HPV vaccination. The shifting of community base immunization to school based setting is beneficial to reach the low in cone community. The goal of this programmed is to create a safe and ensure health of every Filipino child.

**3.3. Work force capacity and activity**

 Workforce capacity to cater the needs of childhood immunization is important in understanding the role of school nurse and attitude toward school based immunization. School nurse competency and it’s familiarity to the students is important. Establishing partnership with health and education authority help to strengthen the immunization program. This is beneficial in improving immunization coverage for school age children. School nurse and parent partnership is school health care is important in tailoring interactive process in balance responsibilities in providing tailored care. Establishing trust relationship, transparent and open communication help the children to meet their needs. Advocating the students and performing role together for the student is essential to achieve optimum outcome. Uhm & Choi (2022). Ensuring the complexity of collaboration between school health care in promoting students’ welfare.

 School have become increasing int the delivery of immunization program. The evidence shows the role of school-based vaccination in promoting essential program such as routine booster immunization program, and program for vaccination. This help to reduce burden in the disease. Perman, et.al. (2017). Understanding the processes that influence school-based vaccination programmed is important information for shaping strategy and policy for future programmed.

**Conclusion**

The study review provides critical analysis in the concepts of immunization for the children. This serves as support in in creation of strategic ways in promoting delivering childhood immunization in low income community. Implementing effective delivery establish overall child health. School and community had establish strong monitoring to improve immunization delivery. The availability of services and work force capacity tailors in monitoring programmed. Collaboration with parents, students and school nurse foster foundation in vaccination programmed in school-based setting. The delivery of information on immunization have impact in promoting child health. The study underpinned robust theory informed research to help development of essential programed. As the Philippines strives to meet its public health goals with efforts are being made to achieve public health goals outlined in the Immunization Agenda 2030 and Sustainable Development Goals. This research provides a timely resource that not only highlights areas for improvement but also lays the foundation for targeted interventions that can make a lasting difference in public health outcomes.

**Data Availability**

All the data generated and analyze are available upon request from the authors.

**Ethical Consideration**

Not Applicable

**CONFLICTS OF INTEREST**

The authors declares there are no significant competing financial, professional, or personal interests that might have influenced

Disclaimer (Artificial intelligence)

Author’s hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

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