

**Community-Academic Partnership
To Improve Pneumococcal
Immunization Rates
In an Underserved Population**

*Submitted to Pfizer by
University of Cincinnati
Health Professions Education Collaborative
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OVERALL AIM AND OBJECTIVES

Background: Invasive pneumococcal disease is a leading cause of vaccine preventable illness and death in the United States. *Streptococcus pneumoniae* bacteria can infect the lungs, blood and meninges, with mortality rates of 1 in 20, 5 and 10, respectively.ⁱ These infections result in hundreds of thousands of outpatient visits and nearly two million hospital days each year.ⁱⁱ Given the severity and cost of the illness and its increasing resistance to antibiotics, prevention through immunization is a national priority. Healthy People 2020 set target immunization rates for non-institutionalized adults aged >65 years at 90% and non-institutionalized high-risk adults aged 18-64 years at 60%, up from 2008 rates of 60% and 17% respectively.ⁱⁱⁱ Despite previous health promotion efforts, rates of immunization for racial/ethnic groups have not increased at a sufficient rate to reach these important national health objectives.

Much work has been done to understand barriers to vaccination, which exist at system, provider and patient levels as detailed in the Request for Proposal. Underserved patients face additional barriers associated with low health literacy and poor access to preventive services due to lack of insurance coverage and/or connection to a primary care medical home. As such, immunization rates for poor and minority populations are worse than the national baseline. According to the 2010 National Health Interview Survey, pneumococcal vaccination coverage among high-risk adults aged 19-64 years was 18.5% overall. Coverage among high-risk non-Hispanic whites aged 19-64 years was higher (19.0%) compared with Hispanics (14.8%) and non-Hispanic Asians (11.5%). Among adults aged ≥65 years, coverage was 59.7% overall. Non-Hispanic whites aged ≥65 years had higher vaccination coverage (63.5%) compared with Hispanics (39.0%), non-Hispanic blacks (46.2%), and non-Hispanic Asians (48.2%). Neither overall coverage nor coverage for any specific age or racial/ethnic group differed significantly from 2009 coverage, thus efforts at eliminating racial/ethnic disparities in pneumococcal immunization have not been successful thus far.^{iv}

Published efforts to improve immunization rates tend to target system and provider levels; for example, through coaching of providers to communicate a strong recommendation for vaccination (provider level) or by creating standing orders for non-physician staff to immunize patients (system level).^v Few studies in our literature review attempted to address patient level barriers such as beliefs about immunization that might lead to vaccine refusal or preferences about where and from whom to receive vaccination. In particular, we identified only a few studies which incorporated the use of community-based participatory research (CBPR) methods that engage patients in understanding barriers and crafting solutions tailored to their own communities. The studies we found focused on other vaccinations as a way to improve community health, including influenza and hepatitis B.^{vi,vii} Since published data suggest that patient level barriers are a common contributor to low immunization rates, this seems an important gap in past efforts.^{viii, ix}

Project Aim: With this project, we will create a multi-level strategy to improve adult pneumococcal immunization rates in a high-risk, urban community within Cincinnati, Ohio. Our approach will integrate proven strategies with specific input from our local consumers and community. Through a partnership of community health advocates, a local service agency and students and faculty from the University of Cincinnati Academic Health Center (UCAHC) Open School Student Chapter we will:

Objective 1: Use CBPR methods to conduct focus groups with patients, providers, agency/public health staff and students that:

- Identify local beliefs, practices, facilitators, and barriers related to immunization, including where and by whom such services should be delivered.
- Gain a broader understanding of the local health system with regard to existing immunization services.
- Describe local relationships and patterns of activity within the community that could be utilized to improve immunization rates.
- Provide feedback on development of strategies to improve immunization rates through a local service agency, St. Vincent de Paul (SVDP).

Objective 2: Use quality improvement (QI) methods to design and pilot a multi-level strategy to improve immunization rates among patients served by an interprofessional free clinic housed at SVDP, the UC Open School Clinic, such that we:

- Convene an improvement team at the Open School Clinic that incorporates stakeholders from the community-academic partnership.
- Connect our clinic to local federally qualified community health centers via a community-wide immunization registry.
- Using the QI Roadmap,
 - o Integrate learnings across the focus groups into a key driver diagram that describes our theory of improvement.
 - o Collect and analyze biweekly immunization rates using run charts.
 - o Test interventions with Plan-Do-Study-Act (PDSA) cycles that impact patient, provider and system level barriers specific to our community.
 - o Implement successful interventions and establish plans for sustainability and spread.

Objective 3: Use interprofessional team teaching methods to integrate health professions students from the UC Colleges of Medicine, Nursing, Pharmacy and Allied Health into the project, such that we:

- Conduct a focus group of student volunteers as part of Objective 1.
- Incorporate student leaders into the improvement team and process.
- Develop and deliver a presentation on “Improving Pneumococcal Immunization” to interprofessional student leaders through an Open School chapter meeting.
- Team teach a UC Open School Seminar on “Improving Pneumococcal Immunization” in partnership with student leaders to disseminate project outcomes to interprofessional students, faculty and community stakeholders.

The combination of CBPR and QI methods in this project will clarify modifiable barriers to adult pneumococcal immunization and engage community members as partners in the creation and pilot of a multi-level strategy tailored to our local community. By incorporating interprofessional students, we will develop their skills in these methods and cultivate these future healthcare leaders as champions in immunization advocacy. Each partner on the Project Team will play a specific role in moving from the current state to realizing these goals, as described in the section below on Technical Approach.

TECHNICAL APPROACH

Current assessment of need in target area: Much of the focus of the public health system in Cincinnati is on pediatric immunizations, creating an unmet need for projects that assess and improve adult immunization rates. According to Beth Gay from Immunization Action Team, part of the Cincinnati Health Department (July 2012), population level data for pneumococcal vaccination rates is unavailable. Also, funding is an issue as The State of Ohio does not provide monetary or other types of support for adult immunizations programs.^x Background information on patient, provider and system levels indicate a high risk population facing many barriers to care and fractionated health care services, especially in the area of preventive services such as immunization. We will describe the current need according to three levels: patient, providers, system.

Patient Level: The project will be conducted in the West End neighborhood of Cincinnati, a community with the following demographics according to the 2010 Census: Population 6,627 (73% adults over age 17); Racial Characteristics 89% African American, 10% White, 1% other; Family Structure 80% female-only run households; Housing 88% rent dwelling; Median Household Income \$12,000 (51% live below poverty line); and Transportation 61% of residents do not own one car.^{xi}

One other key indicator of the health of a community is the number of insured individuals. Data by specific neighborhood is unavailable. However, information is available for the Cincinnati Metropolitan area in which the neighborhood of the West End resides. The US Census Bureau estimates that in 2009, 13.4% of the area's population at all income levels is without health insurance. This is an increase of 1% from 2008 to 2009 and is the most recent data available.^{xii}

In order to begin to understand the needs of this community as related to vaccinations, a step-wise process was undertaken by faculty and students of the UCAHC Open School Chapter to obtain preliminary data to submit for a small pilot grant. An informal oral survey was conducted in the lobby of SVDP over a one month time frame in September 2011. Clients were asked a general question: "Would you receive a vaccine, for example for the flu, if available at no charge?" The responses were collected and analyzed for trends.

With this data and a small grant from the American Pharmacists Association Foundation, we began an ongoing pilot immunization project focusing on education of health professions students, screening of existing clients and vaccinating those at risk in the spring of 2012. New patients served by SVDP charitable pharmacy (up to 36 per week) and all patients seen by the Open School Clinic (see Organizational Detail section) are screened to determine eligibility to receive the pneumococcal vaccine. Once identified, patients are asked to return to SVDP to be vaccinated at a monthly vaccination clinic. Since the start of the project, a total of 154 patients have been screened, detecting 108 eligible patients. However, only seven have actually received the vaccine during the monthly vaccine clinics. It is unclear if the reason for not returning to clinic is related to inconvenience of a return trip, lack of understanding of the reason for the service, or concern about receiving the vaccination.

This pilot project underscores our incomplete understanding of patient level barriers that contribute to low immunization rates as well as the high risk of the patients served by SVDP and the Open School Clinic.

Provider Level: Traditionally, patients access immunization services through physician offices. For people living in the West End community, access to primary care is limited. Hamilton County, Ohio has been identified as a partial health care provider shortage area,^{xiii} defined as counties or portions of counties in the United States that have the lowest ratio of physicians to population.^{xiv} The West End neighborhood has only one primary care low cost clinic within the neighborhood, the WinMed clinic at CityWest. In 2010, The West End Clinic, a low cost primary care clinic, closed due to lack of funds. Outside the neighborhood, there are only two primary care clinics that border the West End; the Good Samaritan Free Health Center of Price Hill and the Elm Street Health Center, one of the City of Cincinnati Health Department clinics. To reach any other available clinics, patients must find transportation. Even then, there is no guarantee of receiving care. According to Dr. David Rahner, medical director at Crossroad Health Center (June 2012), a 600-person new patient wait list exists, causing extended wait time between referral and first appointment. These shortages are reflected in the client base served by SVDP. According to Mike Espel Pharmacy Director (July 2012), 30% of their clients do not have a documented primary care provider of record.

This lack of access also extends to other local providers of health care including pharmacies. The charitable pharmacy at SVDP is the only pharmacy located in the West End neighborhood with the next closest pharmacy 1.5 miles away. The SVDP pharmacy has provided over 100,000 prescriptions for those in need with a retail value of about \$10 million to clients who could otherwise not afford critical life-saving medication.^{xv} Increasingly, pharmacists have become one of the important players in delivering of immunization services by providing vaccine-preventable disease screenings, education, administration and promoting advocacy efforts.^{xvi}

While we have described a provider level assessment characterized by shortage, which could itself contribute to lack of access to immunization services, we do not have information on other provider level factors that may be important to understand or improve immunization rates. Specifically, provider beliefs regarding whose responsibility it is to ensure that immunizations are done, personal decisions regarding immunization^{xvii} and communication styles used in making immunization recommendations could impact local rates as well.^{xviii} Our project will seek to uncover these provider level factors specific to the West End community.

System Level: System level factors relevant to immunization services include the landscape of community resources (health care and other), the interaction of those entities, the collection of population level data, and efforts to improve immunization rates at a population level.

We have already described the paucity of primary care medical homes available in the West End. Other changes in the local healthcare system are the opening of the McMicken Homeless Clinic providing health and dental care and social service support to the homeless, as well as the opening of The Good Samaritan Free Health Center of Price Hill in 2011, providing care on a sliding fee schedule to uninsured patients. Likewise, the Elm Street Health Center is the closest City of Cincinnati Health Department clinic to the West End, located 1.2 miles from SVDP. All five of these organizations offer adult primary care services and both WinMed and Crossroad use the patient-centered medical home model of care delivery. These five health care organizations function as independent entities.

Importantly, four of the five clinics do use a state-wide immunization registry called ImpactSIIS (Statewide Immunizations Information System) to document immunizations given, to avoid duplication of immunization and in some cases, to conduct improvement projects around immunization rates within their practices. Only Good Samaritan Free Health Center of Price Hill does not use this system, as they do not provide immunization services currently. Managed by the Ohio Department of Health, ImpactSIIS serves as a health information exchange (HIE) to warehouse and manage immunization data. The ultimate goal is to provide efficient and accurate immunization information to stakeholders (providers, schools, parents) to ensure appropriate and timing vaccinations.^{xix}

At the hospital system level, West End lies between 4 and 4.5 miles from three major hospitals: UC Health University Hospital, Good Samaritan Hospital and Mercy Hospital Western Hills. Also nearby is Deaconess Hospital, which provides mental health services. According to JCAHO requirements, all these locations have pneumococcal vaccination as a core quality measure and use a universal screening and standing order process to ensure delivery. Thus, the hospitals could be important providers of this immunization. Unfortunately at this time, the hospitals do not document immunizations in ImpactSIIS, making the true immunization rate in the community, and the degree it is contributed to by hospitals, difficult to determine.

With this diversity of entities in the neighborhood, understanding more completely what connections they have to each other and where patients can get what services will be an important part of improving immunization rates. Creating a picture of the system as a whole would also include using IMPACT to look across institutions and track immunization rates at the community level - something currently done for pediatric but not adult immunizations.

Intervention Design and Methods

Objective 1: Use CBPR methods to conduct focus groups with patients, providers, agency/public health staff and students. (Refer to detailed objective points on page 2.)

Design: Community-Based Participatory Research

Identifying barriers and facilitators to immunization at the client, provider, and system levels is an important first step in efforts to increase immunization rates. Capturing the unique first-person perspective of those individuals targeted by health promotion efforts requires a participatory and emancipatory approach to knowledge generation. This framework is especially crucial when engaged in cross-cultural health encounters. Community-based participatory research (CBPR) is one such approach. CBPR focuses on the social, environmental, and behavioral determinants of health and health behaviors, and the manner in which these factors influence health disparities.^{xx} CBPR emphasizes partnering between community members and agencies, and researchers in order to explore specific health needs of the population. This collaborative approach ensures the research conducted, and the programs developed, are relevant, meaningful, and appropriate to the targeted population.^{xxi} Because of their active involvement, community members who participate in the planning and development of these programs go on to serve as advocates during implementation.^{xxii}

In this project, a CBPR approach is used as a key strategy to improve the quality and validity of research by engaging members of the community and a trusted community agency

as partners in the research process. This partnership then facilitates the development and implementation of a population-specific, multi-modal, interprofessional strategy to increase immunization rates within the community. Therefore, it is crucial to the success of our project that it is embraced by the community and each key stakeholder group.

Methods:

Project Kick-Off Event: In order to initiate the CBPR approach for this project, we will first hold a project kick-off. This event will be open to members of the community currently engaged in receipt or delivery of services through SVDP. This will result in the identification of those who wish to become members of the community-academic partnership

Data Collection: Following the project kick-off event, the community-academic partnership will be convened. This group will include representation from the following key stakeholders: community members (clients), providers (including UC faculty), agency/public health staff and Open School students. Once convened, all members will be trained in basic CBPR methods, including protection of human rights during research process, self-management support, basic QI, and pneumococcal disease vaccination procedures. Members will assist with both the development of questions to be used to guide each focus group, as well as identification and recruitment of potential focus group participants.

Focus groups are a well-documented data collection strategy used to collect qualitative data from participants. This type of research is important in the health care arena to obtain client-specific information which can be used to encourage positive health change in both individuals and communities.^{xxiii} Focus groups can be used to gain more in-depth understanding of attitudes, thoughts, opinions, and ideas of the community. This approach is especially well-suited to collecting information from underserved populations, such as poor or ethnic minority groups.^{xxiv} Input gained in this manner helps to ensure that the health promotion programs developed are clear, practical, relevant, and culturally appropriate. In addition, active participation in program development leads to a greater sense of ownership once programs are initiated. Focus group methodology uses in-depth, open-ended group discussions centered around a specific set of pre-defined issues.^{xxv} For this project, active involvement of representatives from key stakeholder groups will be facilitated through two phases of focus groups. Thus, the voices of the community will inform both the development and refinement of our multi-modal strategy.

Focus Groups – Phase 1: Project Development

Recruitment: Data collection will proceed through a series of focus groups held with each stakeholder: (1) Clients, (2) Healthcare providers, (3) Interprofessional healthcare students, and (4) Agency/public health staff. These focus groups will provide a more in-depth understanding of the issues related to immunization from the perspectives of each stakeholder group. This will allow for discovery of beliefs, practices, facilitators, and barriers related to immunization, as well as uncover the language used by each of these groups when discussing this important issue.

Two focus groups consisting of approximately 6-8 participants will be held at each stakeholder level. Focus group sessions will be scheduled for one to two hour time periods allowing for maximum participation of targeted stakeholder groups. Initial recruitment of focus group participants from the first three levels of stakeholders will be initiated through

the community-academic partnership convened at project initiation. Community agencies, crucial to expansion of immunization programs, will be identified during focus group discussion with each of the above stakeholders. Once agencies have been identified, representatives from each will be recruited to participate in two additional focus groups.

Clients who participate in focus groups will receive a \$20 grocery store gift card in appreciation for their time. Childcare will be provided in order to facilitate participation. All focus groups will include light refreshments for participants.

Facilitation: Focus groups with clients, providers, and students will be held at SVDP in a large, private community room. Focus groups with community agency/public health staff will be held at a mutually-agreeable location to maximize participation.

Sessions will be audiotaped to allow for data analysis. At the beginning of each session, participants will be given an overview of the purpose of the study and asked to sign a consent form. When all consents have been collected, the moderator will begin the group discussion. The discussion will be informed by a semi-structured interview guide. A co-moderator will be in charge of observation and note-taking related to group processes, activities, climate, and discussions taking place during each session.

Data Analysis: The audiotapes and notes from each focus group session will be transcribed by a trained transcriptionist in preparation for data analysis. Once these transcripts have been verified, files will be uploaded and stored using Ethnograph v6.0. Data will be analyzed using content analysis and line-by-line coding. During this process, three interprofessional faculty members will independently code transcripts, identifying key patterns and themes. These individuals will then meet to discuss patterns and themes identified and reach consensus, thus ensuring intercoder reliability.

Findings: Once key patterns and themes related to beliefs, practices, facilitators, and barriers related to immunization are uncovered across the key stakeholder groups, the project team will synthesize learnings which will then be shared with the members of the community-academic partnership as described below in *Focus Groups - Phase 2*.

Focus Groups – Phase 2: Theory Refinement

Phase 2 of data collection will involve an additional focus group with each of the four previously identified stakeholders. During this process, learnings from the Phase 1 will be shared and refined through cognitive interviewing. Cognitive interviewing is a technique used to provide insight into the perceptions of individuals who are invited to verbalize thoughts and feelings as they examine information.^{xxvi} Participants will review themes and concepts generated during Phase 1, and through a group process, identify problems and express opinions regarding findings. Thus participants in Phase 2 focus groups will serve to ensure trustworthiness, credibility, dependability, and confirmability of the data obtained during Phase 1 focus groups. Phase 2 focus groups will also serve as the transition point from the first half of the project using CBPR to the second using QI methods, as described below.

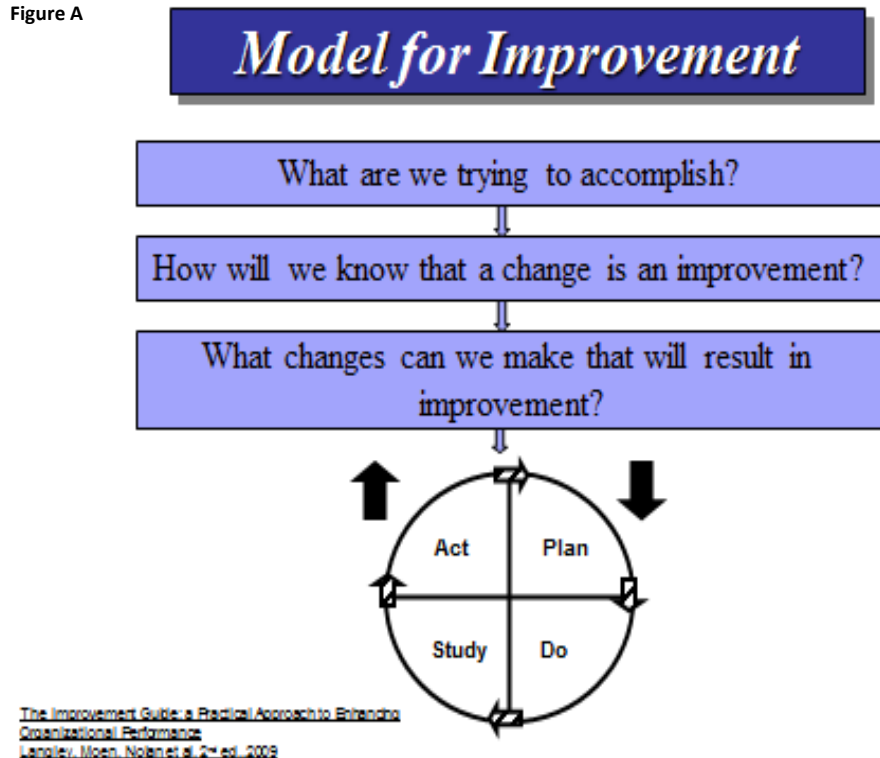
Objective 2: *Use quality improvement (QI) methods to design and pilot a multi-level strategy to improve immunization rates among patients served by an interprofessional free clinic housed at SVDP, the UC Open School Clinic. (Refer to detailed objective points on page 2.)*

Design: Quality Improvement Science

With the learnings from the focus groups and working as a community-academic partnership, we will use quality improvement science to design and pilot a multi-level strategy to improve immunization rates through the Open School Clinic. The Model for Improvement (See Figure A, below) provides a framework for describing a theory of improvement within a system and the method of progressive, small scale testing to create system change over time that results in improvement toward the identified goal.

This method, which is based on the theory of Profound Knowledge described by W. Edwards Demming, incorporates his domains of appreciation of the system, a theory of knowledge, human psychology and understanding of variation^{xxvii} to guide systems change. Increasingly, QI methods are used in health care to move beyond a professional ethos of doctor-patient interaction to a population-level, systems-based approach to care.

Figure A



Fundamental to the Model is the identification of a specific goal and associated measure that can be quantified and tracked over time to assess progress. This process is often now facilitated by electronic medical records or registries which allow population-level data monitoring through reports and dashboards. A theory of improvement can be depicted using different tools; for example, a key driver diagram (See Figure B, next page) connects the specific aim of a project to drivers, or characteristics of the system, which must be in place in

order to achieve the aim, and finally to interventions which can be tested to change the system. Small scale tests, called Plan-Do-Study-Act cycles, are then used in a progressive fashion to make changes that move the system toward one which meets the stated goal.

In this project, use of QI methods will allow us to translate learnings from the focus groups into system changes that

improve pneumococcal immunization rates through the Open School Clinic. This process in turn will generate learnings and best practices that then could be expanded to other sites within the West End to improve immunization rates community-wide.

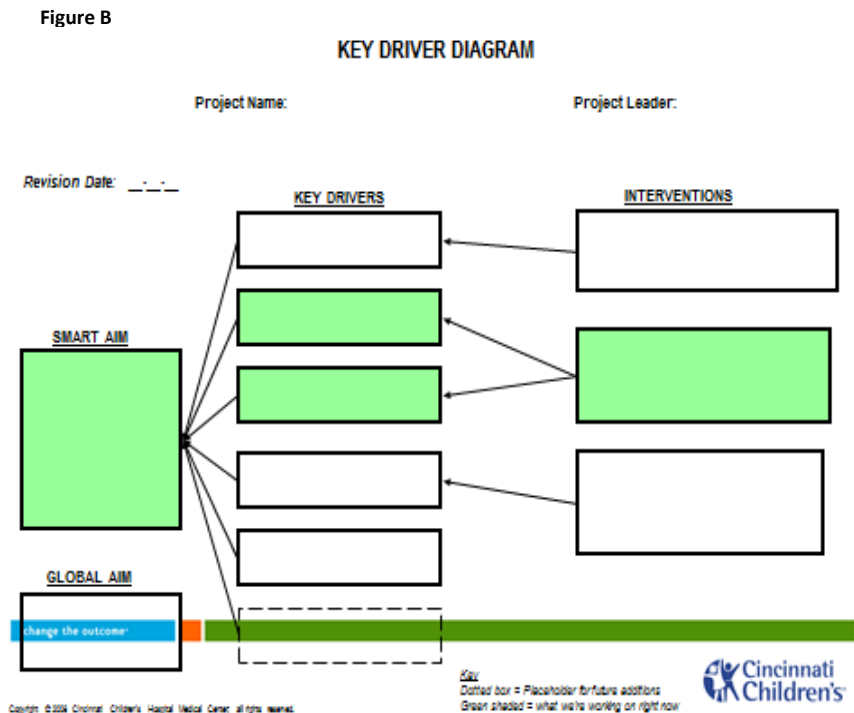
Methods:

Convene Improvement Team: This project is innovative in its blending of CBPR and QI methods. As Phase 1 of the focus groups described in Objective 1 above are completed, we will convene an Improvement Team, consisting of faculty and students from the Open School Clinic and key stakeholders from the community-academic partnership, including one staff member from SVDP, two clients and two Open School students. The clients and SVDP staff member will be compensated for their time, participate in planning PDSA cycles and assist in developing and revising the key driver diagram as new information about the system unfolds. They will work with our Improvement Team to share progress of the project with other stakeholders in the community-academic partnership.

Connect to ImpactSIIS: The federally qualified community health centers and health department clinic in the West End all use the ImpactSIIS immunization registry, presenting an opportunity to track immunization rates both within our clinic and community-wide. We have already begun this process by connecting with Elizabeth Gay from the Ohio Department of Health Immunization Program (July 2012).

We will establish a connection to ImpactSIIS in order to:

1. Collect the baseline pneumovax immunization rate in the West End community by querying deidentified patient information on ImpactSIIS by ZIP code.
2. Maximize identification of eligible patients.
3. Avoid duplication of immunizations.
4. Document immunizations done at the Open School Clinic.
5. Generate biweekly reports to facilitate our use of run charts to display and analyze data.



[Follow Quality Improvement Roadmap](#): Once our Improvement Team has convened and our connection to the registry established, we will follow a step-wise process (depicted in Figure C, below) to guide our improvement project. This process is well known to our faculty and

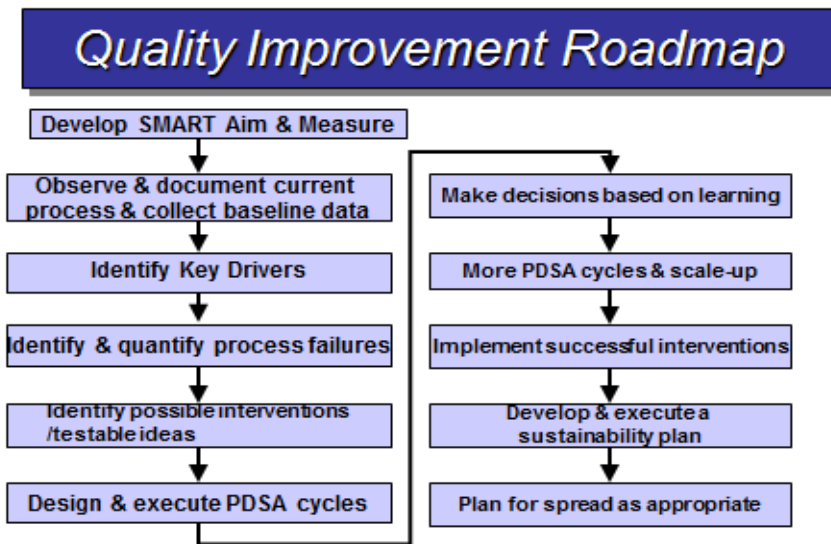


Figure C

students who work at the Open School Clinic as we have used it previously to implement a self-management support system and to improve influenza vaccination rates. We will briefly describe each step here.

[Develop SMART Aim and Measure](#): The SMART Aim is one which is **S**pecific, **M**easurable, **A**ctionable, **R**elevant and **T**ime-bound. Information to develop the SMART aim will come from

the planning and CBPR phases of the project, a sample aim for this project might be: “We will improve the percent of patients seen in the Open School Clinic who are up to date on their pneumococcal vaccination from 20% to 80% within 9 months.” Due to the turnover of clients at SVDP, it is unlikely that immunization rates would reach higher than 80% during the project period, unless an unexpected increase in the background rate occurred through another route in the community simultaneously.

[Observe current process and collect baseline data](#): This step is underway with our pneumovax pilot as described above in *Technical Approach: Current Assessment of Need in Targeted Area* (page 3). Likewise, the focus groups will yield much information about the current system. Our connection to ImpactSIIS will allow us to assess and track pneumovax rates both community-wide and within our Open School Clinic.

[Identify key drivers and possible interventions](#): Once the Phase 1 focus groups are completed and patterns and themes analyzed, our Improvement Team will draft a key driver diagram describing our theory of improvement based on our understanding of the system of immunization services. Using this tool, our team will generate potential interventions based on input from Phase 1 focus groups and the literature on effective strategies to improve immunization rates. These intervention ideas will be discussed with stakeholders at the Phase 2 focus groups to obtain feedback and generate other possible strategies.

[Design and execute PDSA cycles](#): Once this brainstorming is complete, interventions will be prioritized by the Improvement Team using solution selection strategies (i.e., 2X2 diagrams to weigh according to projected benefit and cost). Interventions will then be tested using PDSA cycles with at least one cycle run each Saturday morning during clinic, and results tracked.

Monthly, these individual PDSA cycles will be consolidated into ramps according to intervention for clarity. These documents will be shared to facilitate efficient progress via a cloud file sharing site called DropBox.

[Make decisions based on learnings, scale up testing and implement:](#) As we identify processes that improve our ability to screen patients and deliver immunizations, we will increase the scale of our testing and ultimately implement them as standard in our site. Our process for implementation is through use of protocols that are delivered to faculty and students during training and which drive flow at the clinic. Incorporating immunization processes into the protocols, including staffing protocols, would effectively hard-wire pneumococcal immunization into our clinic.

[Develop and execute a sustainability plan:](#) Once new processes have been implemented, we will establish a method of monitoring to ensure performance remains at goal. Typically this will include less frequent data monitoring, inclusion of immunization in a dashboard and appointing a “process keeper” responsible for sustainability of the improvement.

[Plan for spread:](#) Once we have improved our ability to deliver pneumococcal immunization through the Open School Clinic, we will consider translating this process to other sites. An obvious choice for spread would be to the SVDP Charitable Pharmacy, since they also have hours during the week and could provide immunizations when the Open School Clinic is closed. Other opportunities for spread will be identified through the CBPR process as we better understand beliefs about immunization and patterns of health-seeking activity within the community.

Objective 3: *Use interprofessional team teaching methods to integrate health professions students from the UC Colleges of Medicine, Nursing, Pharmacy and Allied Health into the project. (Refer to detailed objective points on page 2.).*

[Design: Interprofessional Education](#)

The Open School Faculty will design novel curricula to incorporate health professions students into this novel project. At the University of Cincinnati Academic Health Center (UCAHC), as in many similar institutions, training of health professions students is conducted in silos, limiting opportunities to cultivate shared knowledge of interdisciplinary topics such as healthcare improvement, teamwork and the care of vulnerable populations. The UC Open School chapter is a model program which unites faculty and students from all four Colleges of the UCAHC to learn and apply healthcare improvements methods to improve the health of vulnerable populations. The chapter activities (monthly meetings, service site [Open School Clinic], on-line coursework and Open School Seminar Series) will be the venue utilized during the project to deliver and incorporate students into the proposed programming outlined in Objectives 1 and 2. Fundamental to the design will be the creation of curricula on Improving Pneumococcal Immunization rates by an interprofessional faculty team who will then use team-teaching methods to deliver the curricula to interprofessional students.

[Methods:](#)

[Student Focus Group:](#) See Objective 1 Methods (page 6) for details.

[Incorporate Students in Improvement Team:](#) When we convene the Improvement Team, two student leaders of different professions from the Open School chapter will be recruited to

participate. While all student leaders will participate in the project through the chapter meeting presentation and QI process during Saturday morning clinic (through revising the key driver diagram, doing PDSA cycles, review of run charts) only those students selected for the Improvement Team will participate in monthly Improvement Team meetings and project planning. Student participation on the improvement team will assist in realistic planning of interventions to be tested at the clinic and will expose students to a different level of QI planning than seen week to week in the clinic.

Design Improving Pneumococcal Immunization Learning Session: Utilizing existing curricula on immunization, Open School faculty will first design a learning session for the 20 Open School student leaders to be delivered at a monthly chapter meeting. This presentation will serve to introduce the student leaders (who coordinate student volunteers and run the clinic under faculty supervision on Saturday mornings) to the project, background on pneumococcal immunization, and strategies for improving immunization rates. The curricular development will begin with a needs assessment of the students using a short pre-test. Next, based on results of the pre-test, learning objectives and curricular content for the presentation will be created by the Open School Faculty to be presented at the next student chapter meeting. The presentation format will include active learning strategies in which interprofessional students will be broken into small groups to devise potential interventions to improve immunization rates through the Open School Clinic, which will then be shared with the larger group. A post-test will be given to ensure all attain a minimum competency.

Deliver “Improving Pneumococcal Immunization” as Open School Seminar: Upon completion of the program, the Improvement Team will revise the Improving Pneumococcal Immunization presentation to incorporate findings from the project. This presentation will be delivered to the entire UCAHC community (students and faculty) and stakeholders in the community-academic partnership as an Open School Seminar Series. The students, clients and SVDP staff on the Improvement Team will be included on the teaching team for this event.

Evaluation Design

The evaluation of this project will use a matrix evaluation plan that employs a logic model to assess formative and summative outcomes of each of the objectives in this proposal. The logic model strategy focuses on the links between INPUT (funding and other resources), OUTPUT (educational programs, focus groups, patient interviews, and interventions), OUTCOME (increased knowledge by providers, better referral patterns for patients, immunization rates, patient attitudes toward immunization, and increased integration of tracking of patients related to immunization status), and IMPACT (improved health services and health outcomes for at-risk patients). Within this model, both formative and summative strategies will be used to gather data to assess progress toward individual objectives and the extent to which specific metrics within each objective are met.

Objective 1: Use CBPR methods to conduct focus groups with patients, providers, agency/public health staff and students. (Refer to detailed objective points on page 2.)

The evaluation of Objective 1 will include both formative and summative components, anchored by specific measurable outcomes. Our ability to successfully use CBPR methods relies on our ability to introduce our project to the community, gain community buy-in, and to convene a community-academic partnership. Evaluation of success will be determined by: attendance at events, feedback gained through group discussions related to project and process, and enrollment of members for the partnership.

Identification of local beliefs, practices, facilitators, and barriers related to immunizations and development of strategies to improve immunization rates relies on our ability to successfully conduct the focus group series. Evaluation of success for this part of the project will be determined by: attendance and participation in focus groups, dialogue with participants related to process, development and refinement of a QI pilot project

Objective 2: *Use quality improvement (QI) methods to design and pilot a multi-level strategy to improve immunization rates among patients served by an interprofessional free clinic housed at SVDP, the UC Open School Clinic. (Refer to detailed objective points on page 2.)*

The evaluation of Objective 2 will include both formative and summative components, anchored by specific measurable outcomes. Our ability to convene a successful improvement team will be assessed by: composition of the team assembled (i.e., recruitment of the desired complement of interprofessional faculty, students, SVDP staff member and at least two clients), timeliness to assemble the team (as outlined in the Workplan) and effectiveness in team functioning (as measured by the Teamwork Inventory^{xxviii}).

The connection to ImpactSIIS will be measured by the following: timely establishment of connection (as outline in Workplan), effective use of the registry for patient visits in the Open School Clinic (documented in new process development), effective use of the registry as a tool for systems improvement (documented by biweekly registry queries), and notification of local primary care clinics (via ImpactSIIS and documentation of immunization services therein).

Each step outlined in the QI Roadmap will be assessed by:

- 1) Creation of the SMART aim and associated measure.
- 2) Creation and successive revision of the key driver diagram.
- 3) Identification and quantification of process failures through use of failure modes effect analyses and a Pareto chart once the process for pneumococcal immunization has been established.
- 4) Number of PDSA cycles and ramps over the course of the project period.
- 5) Achievement of the target pneumococcal immunization rate at the Open School Clinic during the project period.
- 6) Identification of three successful, local strategies that increase pneumococcal immunization for implementation and spread.

Objective 3: *Use interprofessional team teaching methods to integrate health professions students from the UC Colleges of Medicine, Nursing, Pharmacy and Allied Health into the project. (Refer to detailed objective points on page 2.)*

The first two activities in Objective 3 will be evaluated in the same manner described above in the Objectives 1 and 2 evaluation plan.

The presentation on Improving Pneumococcal Immunization for the student leaders at the Open School chapter meeting will include pre- and post-tests for knowledge assessment. More significantly, this presentation will serve also as an orientation to the project for the students. Assessment of their comfort with their role in the QI process on Saturday mornings will be conducted through a mid-project survey. This survey will be formative in its ability to guide our actions as faculty supervisors in the clinic and as an Improvement Team.

Lastly, the final presentation by the Improvement Team to faculty, students and community stakeholders will be evaluated by number attending (especially of the community-partnership stakeholders), and a survey of participants for its effectiveness in meeting stated learning objectives and likelihood to impact practice.

Dissemination Plan

Learnings and outcomes from each phase of the project will be disseminated through a variety of forums, including oral and poster presentations and written reports/manuscripts. The project will be initiated during a community kick-off event held at SVDP during the first month of grant activity. At this time, members of the community and other stakeholders will be introduced to academic team members, the project, and the topic of immunization. Ongoing progress reports will be shared with academic partnership during monthly meetings held for both interprofessional faculty and student groups. Other members of the academic community will share in the learnings through an Open School Seminar Series. At the conclusion of Phase 1 focus groups, identified patterns and themes, along with an initial draft of a QI plan, will be shared with each stakeholder group during Phase 2 focus groups. At the completion of the project, a final presentation will be made to the entire community-academic partnership, during which time all participants will be invited to provide feedback and indicate interest in continuing involvement as a partnership member.

Submission of an abstract for presentation at the Institute for HealthCare Improvement National Forum is planned during the course of the project. At least two manuscripts will be prepared and submitted to peer-reviewed journals, including a methods article and one based on final project outcomes.

Detailed Workplan and Deliverables Schedule

This project will be conducted over an 18 month period, with Objectives 1 and 2 activities occurring sequentially and Objective 3 activities woven throughout, as described in the Methods section and listed in the Tables in Appendix A. There will be a two-month planning period at the beginning of the project and a two month wrap-up/dissemination period at the end with expected outcomes of those periods detailed below.

Adherence to the timeline and production of deliverables outlined below will be the responsibility of the Principal Investigator (PI) and co-PIs. A Project Leadership Team consisting of the PI, co-PIs, Community-Academic-Partner representative, Project Manager and Project Evaluator will begin meeting twice monthly once notification of grant award is received. The Project Leadership Team, the Community-Academic Partnership and the Improvement Team are the primary entities which will accomplish the project activities.

ⁱ Centers for Disease Control. PPSV Vaccine Information Statement 10/6/09. Available at <http://www.immunize.org/vis/pneum3.pdf>. Accessed on July 10, 2012.

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- ⁱⁱ Huang SS, Johnson KM, Ray GT et al. Healthcare Utilization and cost of pneumococcal disease in the United States. *Vaccine*. 2011; 29:3398-3412.
- ⁱⁱⁱ US Department of Health and Human Services. Healthy People 2020 objectives. Available at <http://www.healthypeople.gov/2020/topicsobjectives2020/pdfs/Immunization.pdf>. Accessed May 7, 2012.
- ^{iv} CDC. Adult vaccination coverage reported via National Health Interview Survey (NHIS). Atlanta, GA: US Department of Health and Human Services, CDC; 2011. Available at <http://www.cdc.gov/vaccines/stats-surv/nhis/default.htm>. Accessed July 9, 2012.
- ^v Vlahov, D, Coady, MH, Ompad, DC. Strategies for improving influenza immunization rates among hard-to-reach populations. *J Urban Health: Bulletin of the New York Academy of Medicine*. 2007; 84(4):615-631.
- ^{vi} Coady M, Galea S, Blaney S et al. Project VIVA: A Multilevel community based intervention to increase influenza vaccination rates among hard to reach population in NY City.: *Am J Public Health*. 2008; 98(7): 1314-1321.
- ^{vii} Ma G, Gao W, Tan Y et al. A CBPR approach to Hepatitis B Intervention for Korean Americans. *Prog. Community Health Partnershp*, 2012, Spring 6(1) 7-16
- ^{viii} Armstrong, K, Berlin, M, Schwartz, JS, Propert, K, Ubel, PA. Barriers to influenza immunization in a low-income urban population. *Am J Prev Med*. 2001; 20(1):21-25.
- ^{ix} Burnett, M, Genao, I, Wong, WF. Race, culture, and trust: Why should I take a shot if I'm not sick? *Ethn Dis.* 2005;15(2Suppl 3):S3.
- ^x Ohio Department of Health. Immunization program Web Site. Available at: <http://www.odh.ohio.gov/odhPrograms/dis/immunization/immindex1.aspx>. Accessed July 12, 2012.
- ^{xi} City of Cincinnati Census and Demographics reports. West End Statistical Neighborhood Approximation. Available at: http://www.cincinnati-oh.gov/bldginsp/downloads/bldginsp_eps45744.pdf. Accessed July 12, 2012.
- ^{xii} The Census Bureau's Small Area Health Insurance Estimates (SAHIE). Available at: http://nkybythenumbers.nku.edu/index.php?option=com_content&view=article&id=41&Itemid=47. Accessed July 15, 2012.
- ^{xiii} Greater Cincinnati Health Foundation Health Landscape. Available at <https://legacy.healthlandscape.org/mapping/index.cfm?tool=1&cat=1>. Accessed July 7, 2012.
- ^{xiv} Greater Cincinnati Health Foundation Health Landscape. Found at <https://legacy.healthlandscape.org/general/productInfo.cfm?tool=1&nav=true>.
- ^{xv} Society of St. Vincent de Paul, Cincinnati, Ohio chapter WebSite. Available at: <http://www.SVDPcincinnati.org/>. Accessed July 14, 2012
- ^{xvi} Obrien, K. Pharmacists role in preventing vaccine preventable diseases. *US Pharm*. 2009;34(8):39-45.
- ^{xvii} Perkins RB, Clark JA. What affects human papillomavirus vaccination rates? A qualitative analysis of providers' perceptions. *Womens Health Issues*. 2012 Jul;22(4):e379-86. Epub 2012 May 18
- ^{xviii} Prichard EN, Jutel A, Tollafeld S. Positive provider interventions for enhancing influenza vaccination uptake among Pacific peoples in New Zealand. *NZ Med J*. 2011 Nov 25;124(1346):75-82
- ^{xix} Ohio Department of Health Statewide Immunization Information System(ImpactSIIS) Web site. Available at: <https://odhgateway.odh.ohio.gov/Impact/Default.aspx>. Accessed July 14, 2011.
- ^{xx} Minkler, M, Wallerstein, N. *Community-based participatory research for health: From process to outcomes*. (2nd ed.) San Francisco: Jossey-Bass; 2008.
- ^{xxi} Israel, BA, Eng, E, Schulz, AJ, Parker, EA. *Methods in community-based participatory research for health*. San Francisco: Jossey-Bass; 2005.
- ^{xxii} Nyamathi, A, Koniak-griffin, D, Tallen, L, Gonzalez-Figueroa, E, Levson, L, Mosley, Y, Dominick, E, Anderson, NLR. Use of community-based participatory research in preparing low income and homeless minority populations for future HIV vaccines. *J Interpro Care*. 2004;18(4):369-380.
- ^{xxiii} Ulin, PR, Robinson, ET., Tolley, EE. *Qualitative methods in public health: A field guide for applied research*. San Francisco: Jossey-Bass; 2005.
- ^{xxiv} Benavides-Vaello, S, Garcia, AA, Brown, SA, Winchell, M. Using focus groups to plan and evaluate diabetes self-management interventions for Mexican Americans. *The Diabetes Educ*. 2004; 30(2): 236-256.
- ^{xxv} Crabtree, BF, Miller, WL. *Doing qualitative research*. (2nd ed.) Thousand Oaks, CA: Sage Publications, Inc. 1999
- ^{xxvi} Sudman, S, Bradburn, N, Schwarz, N. *Thinking about answers: The application of cognitive processes to survey methodology*. San Francisco: Jossey-Bass; 1996.
- ^{xxvii} Demming, WE. *The New Economics for Industry, Government, Education, 2nd Edition*, Boston, MA; MIT Press, 1993.
- ^{xxviii} Kivimaki, M. & Elovainio, M. "A short version of the Team Climate Inventory: Development and psychometric properties." *Journal of Occupational and Organizational Psychology*. 1999; 72: 241-246.

APPENDIX A – Detailed Workplan and Deliverables Tables

Activity	Timeframe	Responsible Person(s) (all to include Program Manager)	Anticipated Outcomes
<i>Conduct community presentation/project kick-off</i>	<i>9/12</i>		<i>Community will become aware of project and list of potential community-academic partnership members will be generated</i>
<i>Convene community-academic partnership and provide training</i>	<i>9/12-10/12</i>		<i>Formation and training of community-academic partnership</i>
<i>Conduct Phase 1 focus groups (8)</i>	<i>10/12-1/13</i>		<i>Interviews conducted with 8 focus groups: 2 at each stakeholder level</i>
<i>Analyze data & draft pilot project outline</i>	<i>11/12-2/13</i>		<i>Identification of themes and patterns; draft of pilot project outline</i>
<i>Convene Improvement Team, Draft Key driver diagram</i>	<i>2/13-3/13</i>		<i>Team formation, Translate learnings Phase 1 focus groups into key driver diagram</i>
<i>Conduct Phase 2 focus groups (4), Incorporate QI feedback</i>	<i>2/13-3/13</i>		<i>Interviews conducted with 4 focus groups: 1 at each stakeholder level; Interventions identified</i>
<i>Analyze Phase 2 focus group data & revise key driver diagram</i>	<i>2/13-4/13</i>		<i>Initial key driver diagram complete, Initial interventions selected</i>
<i>QI project using Roadmap</i>	<i>2/13-12/13</i>		<i>Successive revisions key driver diagram, failure mode effects analysis, process map, PDSA cycles on ramps, run charts</i>
<i>Final presentation in Open School Seminar</i>	<i>1/14</i>		<i>150 persons attending academic-community presentation summarizing project findings</i>
<i>Project evaluation</i>	<i>2/13-3/14</i>		<i>Formative and summative evaluation for each obj and overall project</i>
<i>Project dissemination</i>	<i>1/14-3/14</i>		<i>Presentation at two national meetings, manuscript submitted for publication within six months of end of project period</i>
<i>Final report</i>	<i>2/14-3/14</i>		<i>Final report including project findings and sustainability plan</i>

Activity	July 2012	August 2012	Sept-Oct 2012	Nov-Dec 2012	Jan-Feb 2013	Mar-April 2013	May-June 2013	July-Sept 2013	Oct-Dec 2013	Jan-Mar 2014
Submission of full proposal	→									
Notice of Funding		→								
Planning Period			→	→						
Submit IRB			→							
Plan/Execute Kick-off			→	→						
Recruit/Convene CAP			→	→						
Focus Group Phase 1			→	→	→					
Obj 1 Action Period										
Data Analysis & Pilot project draft				→	→	→				
Focus Group Phase 2					→	→				
Data analysis & revision of key driver diagram						→	→	→		
Obj 2 Action Period										
Construct/revise key driver diagram							→	→		
Conduct QI project							→	→	→	→
Wrap-Up/Disseminate										
Final CAP Presentation										→
Evaluation Period					→	→	→	→	→	→
Final Report										→