C. Main Section

1. Overall Goal and Objectives

Goal

The overall goal of this quality improvement project is to increase pneumococcal immunizations among populations of color in Central and East Harlem by coupling pneumococcal vaccine administration with other pharmacy-based reimbursed services delivered by community pharmacies.

Our approach includes the recognition that community pharmacists may require further education about the need for pneumococcal vaccination, methods for reaching at risk residents, and reimbursement opportunities. We recognize the influence of perceived and actual regulatory and fiscal barriers and the benefit of instructional dialogue with service providers.

Key Objectives

1. Recruit pharmacists from 100 Central and East Harlem community pharmacies for quality improvement project.
2. Conduct focus groups with non-project participating pharmacists.
3. Review relevant literature and Department of Health statistics.
4. Compile list of reimbursement strategies for coupling pneumococcal vaccine administration with other pharmacy-based reimbursed services.
5. Construct database.
6. Design intervention Questionnaire and Resource Manual for pneumococcal service delivery and coupled reimbursement.
8. Implement quality improvement intervention to include instructional Resource Manual.
9. Analyze intervention data.
10. Conduct follow-up to elicit one year post-intervention immunization services using the date of the intervention as the point of reference.
11. Analyze all quantitative and qualitative data.
12. Write up findings, recommendations, and disseminate results.

The following results are intended to address low pneumococcal immunization rates in the predominantly black and Hispanic low-income New York City neighborhoods of Central and East Harlem:

1) Increased number of individuals receiving pneumococcal vaccination at Central and East Harlem community pharmacies.
2) Increased number of Central and East Harlem pharmacies delivering pneumococcal immunizations.
3) Increased number of Central and East Harlem pharmacies employing enhanced reimbursement strategies.

2. Technical Approach

a. Current Assessment of Need in Target Area

i. Quantitative Summary of Need

The current national pneumococcal immunization rate of 60.6%[1] for those 65 and older falls far short of the 90% goal set in Healthy People 2010 and Healthy People 2020.[2] The problem of low immunization rates is particularly acute among the nation's minorities, including among Medicare beneficiaries.[3] In New York City where pneumococcal immunization levels among those ≥ 65 years have remained at about 50% for the past decade, there exist notable racial and ethnic disparities.[4] In 2008, 54% of white, 48% of black, 41% of Hispanic, and 40% of Asian New Yorkers ≥ 65 years reported ever having received pneumococcal vaccination.[5] In the predominantly minority low-income New York City communities of Central and East Harlem, the area of our proposed initiative, only 44% and 28%, respectively, of residents aged ≥ 65, reported ever having received pneumococcal vaccine.[6]

Central and East Harlem, (zip codes 10026, 10027, 10029, 10030, 10035, 10037, and 10039), have a combined population of 272,624. In Central Harlem, 55% of residents are black, 24% are Hispanic, 14% are white, 4% Asian and 3% other; in East Harlem 52% of residents are Hispanic, 29% are black, 12% are white, 6% are Asian and 2% are other.[7] The proportion of Central and East Harlem residents living below the poverty level, 35% and 38% respectively, is nearly twice that of New York City overall.[8] The Central and East Harlem District Public Health Office has the highest rate of uninsured individuals (23.2%) among all the high-risk neighborhoods in New York City.[9]

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[1] National Center for Health Statistics. *Health, United States, 2010: With Special Feature on Death and Dying.* Hyattsville, MD. 2011. Table 85, p.293.

[2] US Department of Health and Human Services. Healthy People 2020 objective topic areas. http://www.healthypeople.gov/2020/topicsobjectives2020/pdfs/HP2020objectives.pdf. Updated 2011. Accessed on July 30, 2012.

[3] Centers for Disease Control and Prevention. Racial/ethnic disparities in influenza and pneumococcal vaccination levels among persons aged >65 years – United States, 1989-2001. *Morb Mortal Wkly Rep.* 2003; 52(40): 958-962.

[4] New York City Department of Health and Mental Hygiene. Community Health Survey 2002-04, 2006 and 2008, Influenza and Pneumococcal Vaccination Among New York City Adults. (2010) *New York City Vital Signs,* November 2010, 9(7).

[5] New York City Department of Health and Mental Hygiene. EpiQuery: NYC Interactive Health Data System - Community Health Survey 2008. http://nyc.gov/health/epiquery. Accessed July 24, 2012.

[6] New York City Department of Health and Mental Hygiene. EpiQuery: NYC Interactive Health Data System - Community Health Survey 2008. http://nyc.gov/health/epiquery. Accessed July 24, 2012.

[7] New York City Department of Health and Mental Hygiene. EpiQuery: NYC Interactive Health Data System. Census 2010. http://nyc.gov/health/epiquery. Accessed 9/29/12.

[8] New York City Department of Health and Mental Hygiene. Community Health Profiles. Take Care Central Harlem. 2nd edition. 2006 and Take Care East Harlem, 2nd edition 2006.

[9] New York City Department of Health and Mental Hygiene. EpiQuery: NYC Interactive Health Data System. Community Health Survey 2010. http://nyc.gov/health/epiquery. Accessed 9/28/12.

Influenza and pneumonia have been among the top three leading causes of death in New York City throughout the past decade.[10] In 2009, in high poverty New York City neighborhoods such as Central and East Harlem, rates of invasive pneumococcal disease (IPD) were almost 50% higher than national rate estimates (18.2/100,000 vs. 14/100,000) and were more than twice as high as rates in low-poverty New York City neighborhoods (18.2/100,000 vs. 8.5/100,000.)[11] The significantly higher rates of IPD in high-poverty neighborhoods are likely related to higher rates of underlying medical conditions that increase the risk of IPD irrespective of age. The rate of diabetes among adults in Central and East Harlem is almost 50% higher than that of New York City as a whole (13.4% vs. 9.3%, respectively); 8% of Central and East Harlem residents suffer from asthma compared with 3.8% of city residents.[12] The rate of HIV infection in Central and East Harlem is twice that for New York City residents overall (1.4% vs. 2.8%, respectively.)[13] Despite increased risk, only 40% of diabetics and 54% of asthmatics in New York City have received pneumococcal immunization.[14]

The New York City Department of Health estimates that there are more than one million New York City residents eligible for pneumococcal vaccine.[15] Extrapolation from Central and East Harlem data regarding racial and ethnic composition, racial and ethnic disparities in pneumococcal vaccination rates, high rates of poverty, and relatively high prevalence of at risk conditions, suggests that there are tens of thousands of Harlem residents who are eligible for pneumococcal immunization and would benefit from greater information about and access to convenient, accessible, low cost immunization services.

Suboptimal immunization levels have been attributed to patient, provider, and structural factors. These include lack of patient and provider knowledge regarding appropriate adult immunization schedules and vaccine safety and efficacy; lack of effective provider reminder system; lack of provider recommendation; absence of standing orders; difficulty accessing services; and lack of health insurance and/or a primary care physician.[16]

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[10] New York City Department of Health and Mental Hygiene. *Executive Summary of the Annual Summary of Vital Statistics*. http://www.nyc.gov/html/doh/downloads/pdf/vs/vs-highlights-of-2010summary.pdf

[11] New York City Department of Health and Mental Hygiene. Invasive Pneumococcal Disease Surveillance in New York City. *Epi Data Brief.* August 2011, No.7.

[12] New York City Department of Health and Mental Hygiene. EpiQuery: NYC Interactive Health Data System. Community Health Survey 2010. http://nyc.gov/health/epiquery. Accessed 9/25/2012.

[13] HIV Epidemiology and Field Services Program. New York City Department of Health and Mental Hygience. *New York City HIV/AIDS Annual Surveillance Statistics 2010.*

[14] New York City Department of Health and Mental Hygiene. EpiQuery: NYC Interactive Health Data System. Community Health Survey 2008. http://nyc.gov/health/epiquery. Accessed 9/25/2012.

[15] Geevrughese Anita. Pneumococcal Vaccination in Commercial Pharmacies. New York City Department of Health and Mental Hygiene Presentation. June 13, 2012.

[16] Vlahov, D., Bond, K.T., Jones, K.C. & Ompad, D.C. (2012). Factors Associated with Differential Uptake of Seasonal Influenza Immunizations Among Underserved Communities During the 2009–2010 Influenza Season. *Journal of Community Health*, *37*(2), 282-287, DOI: 10.1007/s10900-011-9443-x

Successful efforts to address the above have included education aimed at communities, patients and providers, the presence of standing orders, expansion of provider base to include pharmacists and nurse practitioners, and provision of immunization services at alternative nontraditional community based sites such as pharmacies.[17] Pharmacies are ideal venues to offer easy access, convenient, affordable pneumococcal immunization services (multiple sites, extensive hours, lack of requisite appointments, and relatively low cost vaccinations). In addition, automated medication records allow pharmacists to easily identify and reach out to individuals eligible for pneumococcal vaccine either due to age or chronic medical conditions for which they regularly take medications. As community based health professionals with whom individuals with chronic illness often have frequent, long standing, trusting advisory relationships, pharmacists are in an ideal position to make strong pneumococcal vaccine recommendations that are likely to be positively received.[18] In low-income minority neighborhoods, community pharmacies can be an important resource to increase pneumococcal immunization rates and address racial and ethnic disparities.

In New York State, pharmacists have only been authorized to provide adult immunization for influenza and pneumococcal disease since December 2008. Doing so requires pharmacists to obtain additional certification beyond licensure and to have a standing order from a protocol physician.[19] The latter requirement is more readily fulfilled by chain pharmacies than by independent ones.

Barriers noted to commercial pharmacy provision of adult immunization services include time and space constraints, concerns regarding legal liability, lack of standing orders, and variable and inadequate reimbursement.[20] Despite these barriers, community pharmacists' efficacy and willingness as influenza immunizers has been documented in a number of studies.[21] However, their engagement in pneumococcal vaccine administration has been far more limited. The New York State Department of Health Bureau of Immunization reports that between December 3, 2008 and June 30, 2011, pharmacists administered 585,458 doses of seasonal flu vaccine, 68,714 doses of H1N1 influenza vaccine (10/1/09 – 3/31/10), and 9, 621 doses of pneumococcal vaccine.[22]

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[17] Vlahov, D., Bond, K.T., Jones, K.C. and Ompad, D.C. (2012). Factors Associated with Differential Uptake of Seasonal Influenza Immunizations Among Underserved Communities During the 2009–2010 Influenza Season. *Journal of Community Health*, *37*(2), 282-287, DOI: 10.1007/s10900-011-9443-x

[18] Graberstein JD. Pharmacists as vaccine advocates: roles in community pharmacies, nursing homes, and hospitals. *Vaccine,* 1998;16(18):1705-1710.

[19] http://assembly.state.ny.us/leg/?bn=S8673.

[20] Taitel M, Cohen E, Duncan I, Pegs C. Pharmacists as providers: targeting neumococcal vaccinations to high risk populations. *Vaccine.* 2011;29:8073-8076. Pace AC, Flowers SK, Hastings, JK. Arkansas Community Pharmacists' Opinions on Providing Immunizations. *J. Pharm. Pract.* 2010; 23:496-501.

[21] Graberstein, JD, Guess HA, Gartzema AG. People vaccinated by pharmacists: Descriptive Epidemiology. *J. Am. Pharm. Assoc.* 2001; (1):46-52.

[22] New York State Department of Health Bureau of Immunization. *Certified Pharmacist Immunizer Survey Report: 2008 – 2011 Reporting Period. December 2011.* http://www.op.nysed.gov/documents/pharmimmunizerpt.pdf Accessed 10/1/12.

From a commercial pharmacy's perspective provision of pneumococcal vaccine differs from that for influenza in a number of significant ways. The potential patient/ client pool for pneumococcal vaccine is far smaller, (due to markedly different clinical indications, lack of knowledge and demand by at risk individuals and their physicians,) and higher pneumococcal vaccine cost. Hence, there is greater investment in and risk of financial loss from unused pneumococcal vaccine stock.

To address the gap between potential and actual pharmacy delivery of pneumococcal immunization services, in September 2011, the New York City Department of Health and Mental Hygiene (NYCDOHMH) offered pneumococcal vaccine standing orders to community pharmacies willing to provide pneumococcal vaccine administration. To promote greater pharmacist awareness and knowledgeable about pneumococcal vaccine, in June 2012, the NYCDOHMH offered a comprehensive educational seminar for pharmacists detailing clinical, retail, and public health aspects of pneumococcal vaccine. They also provided educational materials for customer distribution. More than one year after making available standing orders and months after provision of a comprehensive pneumococcal educational seminar, the NYCDOHMH had received only 79 applications from the 1650 eligible New York City pharmacies. Only one application was received from any of the 100 eligible community pharmacies located in Central and East Harlem. To date, that pharmacy had vaccinated one individual.[23]

Successful initiatives to increase community pharmacy engagement in pneumococcal immunization services require more than educational programs that increase pharmacists' awareness and knowledge of pneumococcal vaccination. They must also offer innovative approaches to assist commercial pharmacies in addressing practical and financial obstacles they need to overcome for delivery of pneumococcal vaccine services to be attractive and feasible to them. Initiatives that assist community pharmacies in identifying strategies to make provision of pneumococcal immunization services more viable and remunerative, such as enhanced reimbursement through coupled services as we propose, can significantly contribute to overcoming these barriers, to greater community pharmacy engagement in service delivery, increase immunization rates, and to decrease racial and ethnic disparities in immunization levels.

ii. Primary audience targeted for this intervention and direct beneficiaries of project outcomes.

Pharmacists practicing at independent and chain pharmacies in Central and East Harlem are the primary targets of our proposed initiative.

At risk members of these predominantly minority low-income communities are the direct beneficiaries of the outcomes through increased pneumococcal service delivery,

[23] Personal communication. Bureau of Immunization. New York City Department of Health and Mental Hygiene.

(including public advocacy, education, patient identification, patient notification, and vaccine administration by community pharmacies in Central and East Harlem. Increased community pharmacy engagement in pneumococcal vaccine service delivery in other communities through future adoption of innovative enhanced reimbursement strategies would benefit at risk individuals in those communities.

Community pharmacists in Central and East Harlem would also directly benefit through greater revenue as a result of enhanced reimbursement practices. Increased community pharmacy engagement in pneumococcal vaccine service delivery in other areas through future adoption of innovative enhanced reimbursement strategies would benefit at risk individuals in those communities.

b. Intervention Design and Methods

This quality improvement project addresses the established need for increased pneumococcal immunization in Central and East Harlem. This project utilizes a pretest-posttest design.[24] The methods used will include an intervention comprised of a Questionnaire and a Resource Manual that describes a number of specific, individualized plans for increasing reimbursement through coupling of vaccine administration with other reimbursable services.

Year One (Months 1-9) Formative Research and Implementation of Intervention

1) A review of relevant literature will be conducted focused on broader considerations of racial and ethnic disparities; New York City and New York State Departments of Health statistics describing pneumococcal immunization in New York City and Central and East Harlem; and pharmacy delivery of health promotion activities including immunization.

2) Four separate focus groups will be convened with non-project participating pharmacists who are representatives of two chain and two independent pharmacies to elicit perceptions of barriers to and opportunities for reimbursable service delivery such as immunization, smoking cessation, medication therapy management, and syringe exchange; perceptions of clientele and community; and perceptions of role and potential benefits of immunization. The focus groups will be recorded and transcribed.

3) Consecutive cohorts of Touro College of Pharmacy doctoral students will be trained regarding project content and protocols.

4) Students will compile a list of Central and East Harlem pharmacies and conduct a dialogue with pharmacists in both chain and independent pharmacies to explain the quality improvement project and ascertain their willingness to participate in the intervention and follow-up.

[24] Dimitrov DM. Rumrill PD Jr. Pretest-posttest designs and measurement of change. *Work.* 2003;20(2):159-165.

5) A Questionnaire will be constructed by the Principal Investigator, the Co-PI, the Monitoring and Evaluation specialist, and Medical Anthropologist to elicit baseline data describing pharmacy and pharmacist characteristics, dispensing profile, types of reimbursed service delivery, such as influenza and other immunizations, smoking cessation, medication therapy management, syringe exchange, etc., perceptions of clientele and community, levels of pharmacists' knowledge, receptivity and capacity to engage in pneumococcal immunization activities and enhanced reimbursement strategies, e.g., coupling pneumococcal vaccination activities with other health promotion reimbursed initiatives; identification of information technology and capacity; and numbers of pneumococcal vaccine administered in previous two years using the date of the administration of the assessment Questionnaire as the point of reference.

The Questionnaire will also elicit perceived barriers to service delivery. To avoid the problem of extracting data from multiple potentially incompatible data systems, pharmacists will be asked to provide and share data from their medical record systems regarding medication dispensing patterns and immunization activities. Pharmacy and pharmacist characteristics will be identified including: subgroups of appropriate services for coupling, differences in pneumococcal immunization knowledge, perceptions of barriers and benefits, previous two years level of immunization service provision, and receptivity to enhanced reimbursement modalities.

The Questionnaire in and of itself will serve as an educational intervention for pharmacists, drawing their attention to the need for increased pneumococcal immunization services and the possibility of enhanced reimbursement strategies noted earlier. To evaluate its educational aspect, subjects will be asked if there is anything in the Questionnaire that they hadn't known, thought of, or previously considered.

Based on a review of Questionnaire data, specific individually tailored recommendations will be made to each participating pharmacy regarding potential new approaches to increased delivery of pneumococcal services described in the Resource Manual.

6) A Resource Manual detailing reimbursement requirements for specific services such as smoking cessation coupled with immunization administration, will be written for distribution as part of the intervention. The manual will be comprised of educational materials for pharmacy personnel and patients regarding pneumococcal vaccine benefits, detailed information and instruction regarding pneumococcal immunization (certification, standing orders, patient identification, notification, education, and vaccination,) work flow models to assist in overcoming time constraints, and will describe specific enhanced reimbursement opportunities and regulatory procedures for coupling services. The dialogue will be tailored to pharmacy characteristics and subtype of coupled reimbursable services. The manual will be presented to participants with an opportunity for review with the interviewers to answer any questions. Procedures such as pharmacy review of patient

records and notification, and acquisition and display of posters promoting pneumococcal vaccination will be reviewed by the pharmacist and the doctoral student during the instructional session. The checklist will reflect these activities.

7) Protocols and check lists will be constructed for the administration of Questionnaire and the Resource Manual. The check list will document intervention activities.

8) A database will be constructed and a system of data collection and tracking will be devised.

Year One (Months 10-12) Intervention

9) The intervention will be conducted by doctoral students and will entail one day in which the Questionnaire is completed. A second day (or part thereof) will be scheduled as close to the first as possible to conduct an instructional session to review the opportunities for coupled reimbursement and other contained in the manual. The schedules of the intervention will be determined by the individual pharmacists' availability and noted by staff.

10) Available relevant posters and literature supplied by the NYCDOHMH will be delivered in significant quantities at the time of the intervention.

Year Two (Months 1-9) Analysis of Intervention Data

11) Previously collected data will be analyzed by the Lead Team and the Monitor and Evaluation individual.

12) A follow-up Questionnaire will be constructed.

Year Two (Months 10-12) Administration of Follow-up Questionnaire

13) Following a period of one year from the conclusion of the intervention, the follow-up Questionnaire will be administered to participating pharmacists to elicit extent and nature of enhanced reimbursement utilization, content of pneumococcal vaccine delivery, i.e., presence and extent of patient identification, notification, and education; promotional materials displayed; and numbers of persons receiving pneumococcal vaccine during the year following the conclusion of the intervention.

Year Three (Months 1-6) Data Analysis, Reports, Dissemination of Results

14) The Lead Team and the Monitoring and Evaluation Individual will analyze all data. A report will be written and submitted. Papers will be written and presentations conducted to disseminate results.

c. Evaluation Design

i. To determine if the practice gap identified in the needs assessment (i.e., the disparity between actual and potential pneumococcal immunization service delivery by Central and East Harlem community pharmacies) was addressed by the proposed instructional intervention, a pretest-posttest design with subjects serving as their own controls will be utilized.[25] The evaluation will examine the extent of Central and East Harlem community pharmacy engagement and changes in the following metrics: the number of Central and East Harlem pharmacies providing pneumococcal immunization services, number of pneumococcal vaccines administered at these pharmacies in the two years prior to the intervention and the year following the intervention, the number of pharmacies with NYCDOHMH standing orders, the number of pharmacies notifying at risk individuals, number of at risk individuals notified by pharmacy, number of pharmacies utilizing coupled reimbursement, and frequency of use of specific reimbursement strategies.

- **Sources of Data utilized to make above determination will include:**

1. **The New York State Department of Education** listing of registered pharmacies by zip code will indicate all eligible pharmacies in Central and East Harlem.
2. **The Questionnaire** (Pre-test) will provide information regarding the number of participating pharmacies among those eligible; pharmacy characteristics (including dispensing patterns as ascertained from pharmacy automated record systems); presence, nature, and source of standing orders; level of pneumococcal service delivery; and number of vaccines administered in the two years prior to the intervention.
3. **Follow-up Questionnaire** (Post-test) will provide information regarding the number of pharmacies engaging in the instructional intervention and the number engaging in the follow-up; pharmacist perception and utilization of enhanced reimbursement strategies; presence and source of pneumococcal standing orders; level of pneumococcal service delivery; and number of vaccines administered in the year following the intervention.
4. **New York City Department of Health and Mental Hygiene, Bureau of Immunization** will provide data regarding the number of pharmacies with NYCDOHMH standing orders and number of pneumococcal vaccines administered by these pharmacies in zip codes under consideration.

- **Data Collection and Analysis**

1. **The New York State Department of Education** listing of registered pharmacies is available in electronic form upon request.
2. **The Questionnaire** will be collected on tablets by doctoral students and entered into the database in the project office. Frequency distributions of pharmacy and pharmacist characteristics (pharmacy type, size, location, volume, staff, ownership,

[25] Dimitrov DM Rumrill PD jr. Prettest-posttest designs and measurement of change. *Work.* 2003;20(2):159-165.

range of service delivery, certification, etc.) will be cross-tabulated with pneumococcal vaccine knowledge, activity level, engagement interest, and receptivity to innovative approaches. These subsets along with information from the focus groups will inform the specifics of the enhanced reimbursement intervention which will be developed under the direction of the PI and Co-PI.

3. **The Follow-up Questionnaire** will be collected on tablets by doctoral students and entered into the data base in the project office. Comparison of intervention and follow-up data for the following features will indicate target audience engagement in instructional intervention and changes in pneumococcal immunization service delivery; number of Central and East Harlem pharmacies participating in intervention, number providing any pneumococcal immunization services (patient identification, notification, educational posters, and vaccination); number of pneumococcal vaccines administered at these pharmacies in the period under consideration; the number of pharmacies with NYCDOHMH standing orders; the number of pharmacies notifying at risk individuals; the number of at risk individuals notified by pharmacy; the number of pharmacies utilizing coupled reimbursement; and frequency of use of specific reimbursement strategies.

A secondary analysis utilizing data from the focus groups, intervention Questionnaire, follow-up Questionnaire administration, and process and progress notes related to intervention will compare intervention and nonintervention pharmacies and pharmacies that do and do not provide pneumococcal immunization services. Bivariate associations will be compared using chi-square statistics. Multivariate logistical regression will be used to determine factors associated with pharmacy delivery of pneumococcal immunization services, intervention participation, and receptivity to future engagement and alternative approaches.

4. **New York City Department of Health and Mental Hygiene** data regarding issuance of pneumococcal standing order to community pharmacies and number of pneumococcal vaccines administered by each pharmacy in zip codes under consideration will be provided to the Lead Team by **NYCDOHMH Bureau of Immunization.**

The outcome evaluation to determine changes in the gap between potential and actual pneumococcal vaccine service delivery will be accomplished through: a comparison of the number of pharmacies providing these services and level of service delivery, number of pharmacies utilizing enhanced reimbursement strategies, number of pharmacies with NYCDOHMH standing orders, number of clients identified, notified and receiving pneumococcal vaccine during the two years prior to the intervention and one year following the conclusion of the intervention. This data will provide both the control and the outcome data for each pharmacy. The source for the follow-up data will include pharmacy electronic medication record system, NYCDOHMH registry, and pharmacy self report.

- **Method used to control for other factors**

The possible influence of factors external to the intervention on pharmacist behavior visa vie pneumococcal immunization service delivery will be assessed by querying participants regarding such factors in both the Questionnaire and the Follow-up Questionnaire. In addition, NYCDOH Bureau of Immunization data will be used to compare Central and East Harlem community pharmacy engagement in pneumococcal service delivery, (i.e., number of pharmacies with NYCDOHMY standing orders and number of vaccines deliver by them) to that of community pharmacies in the other two New York City "high risk neighborhoods" with designated District Public Health Offices, the South Bronx and North and Central Brooklyn.

ii. Quantification of amount of change expected

There exists no accurate data regarding number of Central and East Harlem community pharmacies providing pneumococcal vaccines or number of individuals who have received pneumococcal immunization at these pharmacies. The data that does exist indicates that to date pharmacists have been the source of few pneumococcal vaccinations. In New York State pharmacists at all type of venues had administered a total of 9,621 pneumococcal vaccine doses between December 2008 and June 2011.

With regard to our targeted community of Central and East Harlem, as of September 2012, there was only one community pharmacy with NYCDOHMH pneumococcal standing orders; some small number of pharmacies may have an alternative standing order source, but clearly administration of pneumococcal vaccine by pharmacists and at pharmacies is an uncommon evident. Based on these numbers, even one additional Central and East Harlem pharmacy with NYCDOHMH standing orders would constitute a 100% increase in pharmacy participation. We expect our initiative to result in a far greater number of pharmacies providing this service.

We anticipate 60% to 70% of Central and East Harlem community pharmacies to participate in the Questionnaire, and that this participation will result, at a minimum, in heightened awareness of community need, increased knowledge of pneumococcal vaccination, availability of standing orders, opportunities for service delivery, and willingness to engage in some level of pneumococcal immunization activities. We expect that most participants (70%) will be willing to identify and notify at risk clients of their eligibility, make vaccine recommendations, and distribute patient educational material, provided as part of this initiative. An additional group, notably those who already provide other forms of reimbursable services, such as influenza immunization, diabetes education, medication therapy management, etc., will readily be able to engage in coupled enhanced reimbursement strategies and provide pneumococcal vaccine administration.

With no precise data, but all information indicating extremely low pharmacy engagement in pneumococcal immunization services, it would be impossible to assign a numeric estimate of the amount of anticipated change. However, in our community any

increase in service provision would be valuable given the magnitude of people, at risk conditions and level of need.

iii. Determination of Target Audience Engagement

Degree of target audience engagement in the intervention will be assessed by determining the number of Central and East Harlem pharmacists who agree to participate, the number completing the Questionnaire, and the Follow-up Questionnaire. Degree of target audience engagement will also be evaluated by determining the number of participating pharmacies that apply for standing orders, displayed pneumococcal vaccine educational posters, identified and notified at risk clients, administered pneumococcal vaccine and utilized coupled reimbursement strategies.

iv. Plan for project outcomes to be broadly disseminated

The project findings will be disseminated through submission of a written report, publication in professional journals, and professional presentations. The report will include findings and recommendations to further promote and support community-based pharmacy delivery of pneumococcal immunization services, e.g., augmented use of technology, work flow models, enhanced reimbursement methods, etc. If successful, we plan to write a description of the model and the steps taken to implement it for use in other communities experiencing racial and ethnic disparities.

3. Workplan and Deliverable Schedule

During Year One, the PI and the Co-PI as the Lead Team will schedule regular bi-weekly and as needed staff meetings. Throughout the first year and as needed, the PI and the Co-PI as the Lead Team will recruit the Monitoring and Evaluation individual, the Medical Anthropologist and consecutive cohorts of doctoral pharmacy students.

During months three through nine of the first year, the Monitoring and Evaluation individual will construct a database devised to include formative research elements, intervention, and follow-up data. This individual will also set up tracking and reporting procedures and systems on computers and tablets. A consultant Medical Anthropologist will conduct four focus groups (2 representing chain pharmacies and 2 representing independent pharmacies). This individual will provide a short training to students in the technique of participant observation for application during the initial contact, intervention, and follow up visit. The content of the focus groups will be recorded and transcribed. The medical anthropologist will be responsible for analysis of focus group content.

Students will compile a list of the approximately 100 pharmacies in Central and East Harlem, noting addresses, hours, and which are chain owned and which are independently owned. The students will be assigned areas of the target neighborhoods taking into account language skills in the case of East Harlem's Spanish speaking population.

Regular staff meetings will be scheduled throughout the project.

Having reviewed the relevant literature, focus group data, and distribution of consenting pharmacies, the Lead Team, Monitoring and Evaluation individual, and Medical Anthropologist will devise a Questionnaire and protocols for the Questionnaire administration to be conducted by doctoral students. Responses will be entered into the database and analyzed.

The Lead Team will also compile a Resource Manual which will describe the various pharmacy-based services which are reimbursable and which can be coupled with pneumococcal pneumonia immunization. This document will include introductory information about pneumococcal pneumonia, the demographics of residents most at risk, databases and information that can be accessed on-line, work flow models, and reimbursement streams and regulations.

During the last three months of the first year, the students will administer the Questionnaire and review the Resource Manual. They will maintain a check list and progress notes as part of the protocol.

During the Second Year, months one through nine, the Lead Team and Monitoring and Evaluation specialist will conduct an analysis of intervention questionnaire data. Rates of participation and retention will be analyzed. The Lead Team will construct a one year Follow-up Questionnaire to elicit data to be used for comparing pneumococcal immunization services provided in the two year period prior to the intervention and those provided in the year preceding the Follow-up Questionnaire and pharmacy utilization of enhanced reimbursement strategies.

During the last three months of the second year, doctoral students will administer the intervention Follow-up Questionnaire. Data will be entered into the previously constructed database.

During the six funded months of the Third Year, the Lead Team and the Monitoring and Evaluation individual will analyze all quantitative and qualitative data. A report will be written describing findings and recommendations. Presentations will be scheduled to disseminate results.

Table of Deliverables, Secondary Deliverables and Schedule for Completion

Major Deliverables	Secondary Deliverables	**Schedule - Year One**
Assemble staff		months 1-2
	Maintain bi-weekly meeting notes	throughout project
Review of Relevant Literature, statistics, and regulations	List of pharmacies	months 2-4
Pharmacists Recruited	Progress notes re telephone and direct engagement of Pharmacists	months 3-4
Four Focus Groups	Focus group transcriptions	month 4
Database		months 3-9
	Data input	throughout project
Questionnaire and Follow-up Questionnaire Development	Protocol Check List	months 6-9
Resource Manual	Protocol Check List Compilation of coupled reimbursable opportunities	months 6-9
Intervention: Administration of Questionnaire and Resource Manual	Check Lists Progress Notes Data input	months 10-12
		Schedule - Year Two
Analysis of intervention data		months 1-9
Administration of Follow-up Questionnaire	Data input	months 10-12
		Schedule - Year Three
Analysis of all quantitative and qualitative data	Write report Submit report	months 1-6
Increased # of pneumococcal immunizations	Written report	months 1-6
Increased # of pharmacies delivering coupled pneumococcal immunizations	Written report	Months 1-6
Conduct presentations Disseminate results and findings		