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Project Title: Virginia Vaccinates: Improving the Commonwealth's HPV and Influenza Coverage

Project Abstract:

For many vaccine preventable diseases, Virginia has been successful in achieving strong immunization rates, leading to good protection and low disease incidence rates. Yet for two key vaccinations, Human Papillomavirus (HPV) and influenza, Virginia lags significantly behind other US states, with HPV adolescent vaccination completion rates of 35.9% for girls (ages 13-17) and 22.5% for boys (ages 13-17) and annual influenza vaccination rates for adults of 48.2%[1]. These completion rates fall far short of the Healthy People 2020 recommendations of 80% for HPV vaccination completion and 70% for influenza[2]. We intend to address these critical shortfalls by employing a well-tested, multi-pronged provider and patient quality improvement intervention in 150 primary care practices across the Commonwealth of Virginia, improving the immunization systems and performance outcomes of at least 450 pediatricians, family physicians, physician assistants, and nurse practitioners. Clinicians that participate in *Virginia Vaccinates* will be educated in successful HPV and influenza immunization practices, will receive both onsite and virtual practice coaching, will review monthly immunization coverage rate reports for their practices from the Virginia Immunization Coverage Assessment Tool (VICAT), will qualify for the completion of quality improvement recertification requirements, and will achieve at least a 30% improvement in the HPV initiation rate, a 10% improvement in the HPV completion rate, and, for those engaged in both active interventions, a 10% improvement in the influenza vaccination completion rate within 12 months of the start of each active intervention.

Project Goal:

Goal 3.3 of *Virginia's Plan for Well-Being* states "Virginians Are Protected Against Vaccine-Preventable Diseases" and targets two specific vaccines for completion rate improvement, HPV and influenza, by the year 2020.

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[1] http://virginiawellbeing.com/
[2] https://www.healthypeople.gov/2020/topics-objectives/topic/immunization-and-infectious-diseases/objectives

Objectives:

Virginia Vaccinates will address this goal by accomplishing five primary objectives.

1) Engage at least 450 primary care clinicians from 150 practice sites across the Commonwealth in a year-long HPV vaccination quality improvement project which requires clinicians to a) connect to Virginia's Immunization Information System (VIIS), submit monthly data, and review monthly coverage rate reports for their practice; b) attend mandatory *Virginia Vaccinates* educational offerings including a one day in-person kickoff session and three webinars; and c) work with an assigned practice coach to make recommended changes in practice delivery to better address HPV vaccine delivery.
2) Engage at least 300 primary care clinicians from 100 practice sites across the Commonwealth in a year-long influenza vaccination quality improvement project which requires clinicians to a) connect to Virginia's Immunization Information System (VIIS), submit monthly data, and review monthly coverage rate reports for their practice; b) attend mandatory *Virginia Vaccinates* educational offerings including a one day in person kickoff session and three webinars; and c) work with an assigned practice coach to make recommended changes in practice delivery to better address influenza vaccine delivery.
3) Engage participating primary care clinicians from both the HPV and the influenza QI projects in an ongoing *Virginia Vaccinates* learning collaborative that extends beyond the proposed grant and offers online tools and resources to address other vaccine preventable diseases as clinicians are interested. Webinars will be available to address improvements in Diphtheria, Hepatitis A, Hepatitis B, Herpes Zoster (Shingles), Measles, Meningitis, Mumps, Pertussis, Pneumococcus, Polio, Rotavirus, Rubella, Tetanus, and Varicella. Given clinician interest and engagement, future active interventions may be planned. Interest will also assist with planning for future reporting capabilities for the VICAT.
4) Achieve at least a 30% improvement in the HPV initiation rate, a 10% improvement in the HPV completion rate, and a 10% improvement in the influenza vaccination rates for the participating practices within one year of the start of their *Virginia Vaccinates* intervention.[3] For HPV, practices will work to increase the percent of both boys and girls ages 11-13 that complete the HPV series. For influenza, practices will work to increase the percent of adults ages 18-65 and 65+ that receive an annual influenza vaccine.
5) Improve the availability, accessibility, and utilization of vaccination coverage reports by Virginia's primary care providers by pilot testing, modifying as necessary, and building a path to sustainability for the Virginia Immunization Information System (VIIS) and the Virginia Immunization Coverage Assessment Tool (VICAT) administered by the Virginia Department of Health.

[3] The *Virginia Vaccinates* program aims to improve HPV vaccination rates for all adolescents, but places an emphasis on those between the ages of 11 and 13 as to reflect the most recent best practices and address a prominent age range where missed opportunities occur.

Governing Structure:

The Virginia Center for Health Innovation (VCHI), a 501-C3 organization, will oversee the *Virginia Vaccinates* Collaborative and will serve as the project administrator and fiscal agent. It will oversee subcontracts with the Virginia Department of Health, George Mason University, Virginia Health Information, and select expert faculty and speakers.

Additional collaborative members include the American Academy of Pediatrics, Virginia Chapter; Cancer Research and Resource Center of Southern Virginia; Massey Cancer Center; the Virginia Academy of Family Physicians; the Virginia Community Healthcare Association; the Virginia Council of Nurse Practitioners, the Virginia Foundation for Healthy Youth, and the Virginia Nurses Association.

VCHI Organizational Description:

A true public-private partnership, the Virginia Center for Health Innovation (VCHI) was incorporated on January 18, 2012, following a recommendation from Governor Robert McDonnell's Virginia Health Reform Initiative. The organization's mission is to facilitate innovation by convening key stakeholders and securing the resources to accelerate value-driven models of wellness and healthcare throughout Virginia. The board of directors includes an impressive array of stakeholders, including health care providers, health systems, health plans, laboratory and pharmaceutical providers, state government, employers, and consumers. (Please see Appendix A for a listing of the current board of directors and a staff organizational chart).

VCHI's core services include:

- Convening and educating stakeholders interested in accelerating the adoption of value-driven models of wellness and healthcare in an effort to improve patient outcomes and advance Virginia's well-being and economic competitiveness.
- Overseeing and facilitating demonstration research to test and evaluate models of value-driven wellness and health care.
- Leveraging data and analytical resources that educate and equip health care providers, public health professionals, government representatives, community organizations, employers, and consumers to make more informed decisions.
- Helping prepare the health care workforce and the public for a high quality, value-driven health care marketplace which features engaged and satisfied clinicians and patients.

VCHI currently employs 4.5 FTEs and has a 2017 operating budget of $1,623,992.[4] Most recently VCHI served as the implementation lead on Virginia's $2.6M *State Innovation Model (SIM) Design* grant from the Centers for Medicare and Medicaid Innovation and on a $10.6M *Evidence Now: Heart of Virginia Healthcare Primary Care Transformation* grant from the Agency for Healthcare Research and Quality. Using its innovative online platform (www.innovatevirginia.org) to connect more than 1,900 individuals interested in health care payment and delivery system reform, VCHI has established a national reputation for leading highly engaged primary care learning collaboratives that are changing how clinicians and communities work together to advance population health.

VCHI's tax identification number is 80-0796077, and it is a 501-C3 organization, awarded public charity status under Section 170 (b) (1) (A) (vi) of the Internal Revenue Code.

Background on Virginia's Immunization Challenge:

In 2016, The Virginia Department of Health unveiled a four-year population health improvement plan for the Commonwealth of Virginia, known as the *Virginia Plan for Well-Being*. The plan lays the foundation for focused population health improvement. It identifies 13 goals among 4 aims and includes 29 discreet measures. The four aims are:

1. Healthy, Connected Communities – Factoring health into policy decisions related to education, employment, housing, transportation, land use, economic development and public safety
2. Strong Start for Children – Investing in the health, education, and development of Virginia's children
3. Prevention Actions – Promoting a culture of health through preventive actions
4. System of Care – Creating a connected system of health care.

Changing the culture of health in Virginia will take significant and ongoing investment and attention by lawmakers, business executives, health care providers, community leaders, and the general public. Achieving population health improvement requires clarity of purpose on issues that matter to people with corresponding measurable outcomes. With this in mind, VCHI, in partnership with the Virginia Department of Health and others, has chosen to start plan implementation by focusing on Goal 3.3 "Virginians Are Protected Against Vaccine-Preventable Diseases" and is targeting two specific vaccines for completion rate improvement, HPV and influenza, by the year 2020.

A close look at the data provides a compelling reason for starting with HPV and influenza vaccinations.

[4] Assuming Merck funding is awarded, $414,868.00 would represent 26% of VCHI's adjusted 2017 budget. This assumes a grant start of August 1, 2017 and the fact that VCHI operates on a calendar budget year.

Human Papillomavirus (HPV):

HPV is the most common sexually transmitted infection and roughly 80 percent of sexually active people contract this disease at some point in their lives.[5] Although the infection is defeated without medical intervention by the immune system in many people that are infected, this is not true for all. About 79 million Americans are currently infected with HPV, with almost 14 million new cases introduced each year, and approximately 50% of these new infections occur in 15-24 year olds.[6] Certain strains of HPV, 16 and 18, have been linked to cervical, anal, vaginal, vulvar and oropharyngeal cancer and genital warts. Based on CDC data from 2008 to 2012, about 38,793 HPV-associated cancers occur in the United States each year: about 23,000 among women, and about 15,793 among men. Cervical cancer is the most common HPV-associated cancer among women, and oropharyngeal cancers (cancers of the back of the throat, including the base of the tongue and tonsils) are the most common among men. In general, HPV is thought to be responsible for more than 90% of anal and cervical cancers, about 70% of vaginal and vulvar cancers, and more than 60% of penile cancers. Cancers of the head and neck are often caused by tobacco and alcohol, but recent studies show that about 70% of cancers of the oropharnyx may be linked to HPV.[7]

It has been proven that the completion of the HPV vaccine series (which is now defined as the reception of 2 shots if the series is started before the age of 15, and 3 shots if series begins at 15 years of age or older or if the adolescent has contraindications) can help protect against these cancers.[8] More needs to be done to improve the up-take and completion of the HPV vaccine in Virginia. Virginia is currently in the bottom half of US states for HPV vaccination, with a ranking of 29 in 2015.[9]

Several American Academy of Pediatrics Quality Improvement demonstration projects[10] have shown that altering the communication between providers, patients, and their parents when discussing vaccination series will increase the up-take of the HPV vaccine. Best practice research finds offering providers education about HPV infection, related diseases/cancers, HPV vaccine information and recommendations (including safety and impact) combined with utilizing tools such as text reminders and EHR recall notifications are successful in increasing immunization uptake. Further education regarding the importance of a consistent strong provider recommendation improves HPV vaccine uptake.[11] Therefore, it is important to educate providers with scripts and modeling on how to recommend the HPV vaccine and engage in conversation with

[5] http://www.hpvtvad.com/
[6] Accelerating HPV Vaccine Uptake: Urgency for Action to Prevent Cancer. A Report to the President of the United States from the President's Cancer Panel. Bethesda, MD: National Cancer Institute; 2014.
[7] www.cdc.gov/cancer/hpv/statistics/
[8] http://www.aafp.org/news/health-of-the-public/20161026acipoctmtg.html
[9] National, Regional, State, and Selected Local Area Vaccination Coverage Among Adolescents Aged 13–17 Years — United States, 2014, CDC Weekly July 31, 2015 / 64(29);784-792
[10] http://www.aappublications.org/news/2016/10/03/Chapters100316
[11] Gilkey, M. B., Malo, T. L., Shah, P. D., Hall, M. E., & Brewer, N. T. (2015, November 24). Quality of physician communication about human papillomavirus vaccine: Findings from a national survey. Cancer, Epidemiology, Biomarkers & Prevention, 1673-1679. Doi:10.1158/1055-9965

patients/families about the vaccine. In addition, utilizing every interaction with patients to identify those that could be due for a vaccine and addressing that need will fill the gap in current vaccination rates and help accomplish the *Virginia Plan for Well-Being* goals. In 2013, if all missed opportunities for HPV vaccination had been eliminated, coverage with at least 1 dose of HPV vaccine before age 13 years could have reached 91.3%.[12]

Influenza:

The flu is a contagious respiratory illness caused by influenza viruses that infect the nose, throat, and lungs. Influenza viruses typically circulate widely in the United States annually, from the late Fall through early Spring. Although most persons who become infected with influenza viruses will recover without severe abnormalities, influenza can cause serious illness and death, particularly among older adults, very young children, pregnant women, and those with chronic medical conditions. During 31 seasons from 1976 through 2007, estimated influenza-associated deaths ranged from approximately 3,300 to 49,000 annually.[13] In addition, the flu is costly to Americans and the workforce. The annual direct costs of influenza in the United States, such as hospital and doctor's office visits and medications, are an estimated $4.6 billion.[14] The flu causes U.S. workers to lose up to 111 million workdays at an estimated $7 billion a year in sick days and lost productivity.[12] Routine annual influenza vaccination for all persons aged ≥6 months who do not have contraindications has been recommended by CDC and CDC's Advisory Committee on Immunization Practices (ACIP) since 2010 as the primary means of preventing influenza outbreak and its complications.[10] Despite this recommendation and the associated risks of a low completion rate, Virginia's influenza vaccination rate for adults over the age of 65 is poor, earning the Commonwealth a ranking of 21st in the nation.[15] Although Virginia's influenza vaccine rates for adults over the age of 18 ranked 11th in the nation for the 2015-2016 flu season, this performance is not adequate, with a coverage rate of only 46%, falling well short of the *Healthy People 2020* and *Virginia Plan for Well-Being* goals of 70%.[16] We can and must do better. Studies have shown that altering the communication between providers and patients, providing provider feedback, and initiating standing orders are the most effective system change methods in improving influenza vaccination rates in adults.[17]

An additional advantage for launching *Virginia Vaccinates* with these two vaccinations can be found in the relative simplicity of the proposed evaluation (detailed later). Both the HPV and influenza vaccinations are applicable to all patients within a given age range. Unlike many other vaccines, such as pneumococcal, the HPV and influenza

[12] https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6329a3.htm
[13] CDC. Estimates of deaths associated with seasonal influenza—United States, 1976–2007. MMWR Morb Mortal Wkly Rep 2010;59:1057–62. PubMed
[14] https://www.cdc.gov/niosh/topics/flu/activities.html
[15] http://assets.americashealthrankings.org/app/uploads/virginia-senior-health-summary-2016.pdf
[16] https://www.cdc.gov/flu/fluvaxview/reportshtml/reporti1516/reportii/index.html
[17] Lau, D., Hu, J., Majumdar, S. R., Storie, D. A., Rees, S. E., & Johnson, J. A. (2012). Interventions to Improve Influenza and Pneumococcal Vaccination Rates Among Community-Dwelling Adults: A Systematic Review and Meta-Analysis. The Annals of Family Medicine, 10(6), 538-546. doi:10.1370/afm.1405

vaccines are not dependent on determining other risk factors before targeting patients or conducting an evaluation of impact. Risk factor determination would add significant data demands – necessitating that all participating practices be able to run immunization reports directly from their EHRs. Our informal survey of Virginia primary care practices suggests this would be a tremendous lift for many, and impossible for some, without additional programming resources that are well beyond the scope of this opportunity. For this reason, we will share information on these additional vaccines with interested practices, but will focus coaching and evaluation on HPV and influenza for this first intervention.

Virginia's Proposed Intervention:

A. Medical and Healthcare Disciplines to be Included:

This intervention will be targeted to Virginia's pediatricians, family physicians, nurse practitioners, physician assistants, nurses, and medical assistants.

B. Description of the Planning and Recruitment Phase:

The first six months of the project will be dedicated to securing two new practice coaches,[18] recruiting primary care practices, securing maintenance of certification approval, finalizing curriculum and printed material orders and implementing necessary technology enhancements to the Virginia Health Innovation Network (administered by VCHI), and the Virginia Immunization Information System (VIIS) and the Virginia Immunization Coverage Assessment Tool (VICAT) (administered by the Virginia Department of Health).

Practice Recruitment will include 300 practices from across all geographic regions of the Commonwealth - 100 pediatric practices and 200 family practice (FP) and federally qualified health centers (FQHC). This will ensure a diverse patient mix in terms of ethnicity, income, and insurance status. FPs and FQHCs commonly treat both children and adults, so they can participate in both interventions or serve as controls for both. The pediatric practices will participate or be controls for the HPV intervention only. Each practice will be assigned to treatment or control groups at random. Fifty pediatric and 100 FP/FQHC practices will receive the active HPV intervention (months 7-18) and 100 FP/FQHC practices will receive the active influenza intervention (months 19-30). All practices will be required to participate in the Virginia Immunization Information System and commit to monthly data submission and engagement with a practice coach. Practices will be reimbursed $50 per month for the completion of required data submissions and review of monthly immunization completion reports.

Practice recruitment will be led by VCHI, with assistance provided by all *Virginia Vaccinates* collaborative partners. In 2016, VCHI successfully recruited 220 primary care practices to participate in its Agency for Healthcare Research and Quality (AHRQ)

[18] Note: Highly qualified individuals have already been identified for the 12 other project positions.

EvidenceNow: Heart of Virginia Healthcare Primary Care Transformation intervention (http://www.vahealthinnovation.org/hvh/) and has built exceptionally strong relationships with Virginia's physician and nursing communities. VCHI's senior practice coach recently served as a Membership Director for the Medical Society of Virginia and is personally well acquainted with the physician and administrative leads in hundreds of primary care practices across the Commonwealth. Nearly all of Virginia's health systems are members of VCHI's Leadership Council (http://www.vahealthinnovation.org/who-we-are/lcmembers/) and can be counted on to assist with recruitment of health system owned primary care practices. Additionally, the project's co-medical directors serve as presidents of the Virginia Chapter of the American Academy of Pediatrics and the Virginia Academy of Family Physicians, which provides a unique and powerful recruitment and distribution channel, especially with private practice physicians. These co-medical directors have committed to assisting with peer recruitment and their respective associations have committed to working to disseminate participation information to their respective members. Likewise, the Virginia Council of Nurse Practitioners and the Virginia Nurses Association have representatives serving on the *Virginia Vaccinates* collaborative and will work with VCHI to engage their members. Finally, VCHI will recruit interested Federally Qualified Community Health Centers, and will be aided in this endeavor by the fact that VCHI's offices are physically co-located with the state association for the FQHCs (the Virginia Community Healthcare Association) and the two entities have an established track record of working together on quality improvement initiatives.

The recruitment proposition for primary care practices is critical to the success of the intervention and includes five main components:

1) *A data-driven Call to Action*. *Virginia's Plan for Well-Being*, which specifically targets just two immunizations for improvement –HPV and influenza – and shares detailed information on Virginia's poor performance, provides an impetus for health care providers to strive for quality improvement in this specific area. Additionally, new functionality (coming online summer 2017) from the Virginia Immunization Information System and the Virginia Immunization Coverage Assessment Tool will allow each participating practice to receive and review a monthly report on their immunization coverage performance. This type of specific performance feedback reporting is a powerful tool for positive change.
2) *A tested quality improvement intervention*. The intervention selected by *Virginia Vaccinates* has had its core elements successfully piloted by a small sample of Virginia and North Carolina practices (please see attached Appendix B), the Tennessee Immunization Program, and the National Improvement Project Association, and utilizes materials recommended by the CDC, the American Academy of Pediatrics, and the American Academy of Family Physicians.
3) *Maintenance of Certification credit*. Physicians and nurse practitioners completing the *Virginia Vaccinates* HPV or Influenza practice intervention will be awarded recertification credit known as Maintenance of Certification, Part IV, which requires completion of a qualified quality improvement project (approved by their national specialty society) within a specified time period in order to

continue practicing medicine or nursing.[19] This is not continuing medical education, but instead a requirement that providers engage in problem solving and documented quality improvement within their own practices. Without assistance, maintenance of certification can be a very arduous process for providers busy with day-to-day operations and patient care. The provision of a practice coach and a qualified maintenance of certification project is typically greeted with considerable enthusiasm by primary care providers and makes a terrific recruitment tool. VCHI is experienced in working with the national specialty societies to secure the necessary maintenance of certification credit.

4) *Connectivity between the proposed intervention and existing financial incentives for quality improvement*. Immunization completion rates and connection to a certified registry (such as the VIIS) are increasingly required in provider performance contracts and CMS alternative payment models. During the planning phase of this initiative, the *Virginia Vaccinates* collaborative will prepare a one-page briefing for interested practices detailing how participation in the intervention will assist them in meeting these specific performance requirements and earning maximum financial incentives from their health plan contracts.

5) *Easy data submission*. Each practice participating in the intervention, either as a control or an active intervention site, will be able to submit the required immunization completion data by simply connecting their practice's electronic health record to the Virginia Immunization Information System (VIIS). Many practices across the Commonwealth (3,789 as of January 2017) are already connected to VIIS, as participation in this registry is required in order to secure free vaccines through the Vaccines for Children Program and to complete the CMS Meaningful Use requirement for participation in a registry. For those that are not already connected, there is a one-time cost of $100 to secure an organization ID (OID) and connect to Virginia's Health Information Exchange (ConnectVirginia). This connection fee will be covered for those for whom it would be a barrier to participation. We estimate that no more than 30 percent of practices will need a new OID. Additionally, the Virginia Department of Health will provide technical assistance to any practice that would benefit from support in making the technical connection. What is new with the *Virginia Vaccinates* initiative is that a new tool will be offered with the VIIS registry – the Virginia Immunization Coverage Assessment Tool – which will change the registry's information flow from one directional (practices submit data to VDH) to bidirectional (practices submit data to VDH and then can review their patients completion rates, from all sites where their patients may get care). The same technology will be used for both purposes and every month when a participating practice completes its data upload it can review its completion report and earn a $50 incentive payment. No other data reporting will be required. No chart reviews or EHR extractions. This will make the *Virginia Vaccinates* data submission requirements highly efficient and user friendly.

[19] At this time, this will not apply to physician assistants, as their recertification process relies entirely on the completion of continuing medical education and does not include the additional component of completion of a quality improvement project.

As practices are being recruited, VCHI will add three new communities (one for HPV, one for Influenza, and one for All Other Vaccines) to its Virginia Health Innovation Network (VHIN) platform and the lead practice coach, with assistance from project partners, will begin uploading the selected curriculum tools and resources. VHIN allows our participating providers and our project faculty and coaches to have a secure, private space where they can share information, ask questions, and connect electronically. VCHI and VDH both use VHIN to facilitate quality improvement work on other statewide grants and find that it is a cost-effective mechanism to promote engagement *anytime a provider is ready to engage, day or night*. It is a one-stop shop for all project information and extremely user friendly. To date, more than 1,900 providers and health policy experts are active users of the VHIN for a wide variety of Virginia projects and events.

C. Description of the HPV Intervention:

After the six-month planning and recruitment phase is complete (January 2018), the second phase will be a 12 month (February 2018-January 2019) HPV active intervention for 150 pediatric, family medicine, and federally qualified community health center practices. Each practice will be assigned to one of three practice coaches and will work with their coach at an initial visit (completed during the first three weeks of February 2018) to complete a practice readiness assessment and an office systems inventory. Next practices will participate in a one-day kickoff event that will feature information on best practices in HPV immunization. While in person attendance at this event is not required for practices to be part of the learning collaborative, it is strongly encouraged. Each participating practice will be encouraged to send a physician lead and an office management and/or nursing lead to the kickoff session. A webinar version of the event will also be offered for practices that cannot attend in person, or who wish to share the information with additional members of their team. iPads (preloaded with educational videos for patients and parents) will be distributed to practices at each kickoff event, and the day will feature presentations from three nationally recognized experts on HPV vaccination quality improvement.

In addition to hearing from the three speakers, practice participants will be introduced to the *Virginia Vaccinates* online learning platform, which will be hosted on the Virginia Health Innovation Network (innovatevirginia.org). They will see how they can use this tool to review educational content, interact with their peers, and engage with their practice coach.

Following the project kickoff, the practice coach will continue working individually and jointly with the participating practices. Through a series of in-person meetings, conference calls and webinars, the practice coach will address the following topics:

1) Improvements in provider communication
    a. Focus on cancer messaging, not sexual debut
    b. Practice with scripts and modeling
    c. Role for <u>all</u> practice staff

    d. Use of sandwiching and bundling techniques

2) Improvements in practice systems
    a. Review of immunization completion reports
    b. Standing orders to allow nurses/medical assistants to administer follow-up shots
    c. Reminder/recall supports
    d. Scheduling of follow up appointments

3) Improvements in patient education -- *Bug Your Doc* Campaign (used effectively in Tennessee)
    a. Advance brochures
    b. Q&A sheets
    c. Magnets
    d. Recall postcards
    e. Videos in waiting room

Coaches will also work to ensure practices are submitting data via the VIIS and will connect practice staff with a VIIS data integrity monitor if needed to address data quality or technology concerns.

The HPV intervention will be complete by January 2019.

D. Description of the Influenza Intervention:

The influenza intervention will begin in February of 2019 and will roll out in an identical manner to the HPV intervention. The only notable differences include the composition of the practices (Cohort 2 will include family medicine practices and federally qualified health centers, but not pediatric practices) and the focus of the curriculum. For the influenza intervention, the practice coaches will focus on the following topics:

1) Improvements in provider communication
    a. Focus on risks of not receiving vaccine
    b. Practice with scripts and modeling
    c. Role for <u>all</u> practice staff

2) Improvements in practice systems
    a. Review of immunization completion reports
    b. Standing orders to allow nurses/medical assistants to administer follow-up shots
    c. Reminder/recall supports

Coaches will also work to ensure their practices are submitting data via the VIIS and will connect practice staff with a VIIS data integrity analyst if needed to address data quality or technology concerns.

The influenza intervention will be complete by January 2020.

E. Ongoing Learning Collaborative Opportunities

Following completion of their active interventions (either HPV only for pediatric practices or influenza for family practice and FQHC sites), all *Virginia Vaccinates* sites will maintain access to the Virginia Health Innovation Network and will be encouraged to engage in a series of webinars addressing opportunities to improve performance on Diphtheria, Hepatitis A, Hepatitis B, Herpes Zoster (Shingles), Measles, Meningitis, Mumps, Pertussis, Pneumococcus, Polio, Rotavirus, Rubella, Tetanus, and Varicella vaccines. These webinars will be offered to all participants for at least one year following the completion of the active intervention.

F. Description of Lead Project Staff:

Project Director: *Beth A. Bortz, MPP, President and CEO, Virginia Center for Health Innovation*. Since starting VCHI in 2012, Ms. Bortz has secured more than $20M in federal, state, corporate, and foundation funding for Virginia innovation and reform initiatives, while garnering strong bi-partisan support for her organization's health improvement priorities. Previously, she served as Executive Director of the Medical Society of Virginia Foundation, where she launched the Claude Moore Physician Leadership Institute and led a series of quality improvement collaboratives to address antibiotic resistance, asthma and cardiovascular disease. Her experience also includes service as Deputy Director of the Virginia Health Care Foundation and as a Senior Associate Legislative Analyst for the Virginia General Assembly. Ms. Bortz currently serves on the Board of Directors of Virginia Health Information, Lead Virginia, and the Maggie L. Walker Governor's School Foundation. She was a founding board member of Rx Partnership, serving as Board Chair from 2006-2008. She has received several awards and recognition for her work, including *Virginia Leader of the Year* 2014 from Lead Virginia, *Influential Women of Virginia* Award from Virginia Lawyer's Media; *Medallion Award for Community Partnership* from Mutual of America; *Stettinius Award for Nonprofit Leadership* from the Community Foundation representing Greater Richmond; and Style Weekly's *Top 40 Under 40*. Ms. Bortz earned her undergraduate degree in Economics and Government and her Masters in Public Policy from the College of William and Mary.

Medical Director, HPV: *Samuel (Sam) T. Bartle, MD, FAAP, FACEP, President, Virginia Chapter American Academy of Pediatrics*. Dr. Bartle practices pediatric emergency medicine with the Medical College of Virginia Physicians and is an Assistant Professor in the Department of Emergency Medicine and the Department of Pediatrics for Virginia Commonwealth University Health System. He currently serves as the chairman of the state EMSC board and the pediatric representative to the Governor's Advisory Board for Emergency Medical Services. He has advocated on behalf of children at the Virginia General Assembly and as the pediatric representative on the Governor's sub-panel on Disaster Preparedness. Dr. Bartle also serves as the EMSC representative on the Governor's Emergency Medical Services Council Advisory Board. He is an alumni of 2010-11 Claude Moore Physician Leadership Institute. He received his medical degree from the University of South Alabama College of Medicine;

a fellowship in pediatric emergency medicine was earned at the University of Alabama in Birmingham; and was granted a bachelor's degree from the University of Alabama.

Medical Director, Influenza: *Lindsey D. Vaughn, MD, FAAFP, President, Virginia Academy of Family Physicians*. Dr. Vaughn has served the citizens of Suffolk and the Western Tidewater region of Virginia as a family physician for over twenty years. He is passionate about providing quality health care for his patients as well as the thousands of patients who are part of the Sentara Quality Care Network (a clinically integrated network including hospital-owned, independent, and FQHC practices), for which Dr. Vaughn serves as Chair. His medical background includes attending Eastern Virginia Medical School and then VCU - Riverside where he completed his residency in Family Medicine. He was a physician partner in Family Medicine Associates for 20 years. In 2013 he joined Sentara Medical group and currently serves as Associate Medical Director.

Evaluation Lead: *Len M. Nichols, PhD, Director of the Center for Health Policy Research and Ethics (CHPRE) and a Professor of Health Policy at George Mason University*. Dr. Nichols has been intimately involved in health reform debates, policy development, and communication with the media and policy makers for 20+ years, after he was Senior Advisor for Health Policy at the Office of Management and Budget (OMB) in the Clinton Administration. Since that time he has testified frequently before Congress and state legislatures, published widely and spoken to a tremendous range of hospital associations, physician groups, and health policy forums around the country. After OMB, Dr. Nichols served as a Principle Research Associate at the Urban Institute, Vice President of the Center for Studying Health System Change, and Director of the Health Policy Program at the New America Foundation. In addition to his positions at GMU, Dr. Nichols is on the Board of Directors of the National Committee for Quality Assurance and serves as advisor to the Patient Centered Primary Care Collaborative and as a member of the HHS Physician-Focused Payment Model Technical Advisory Committee. In Virginia, Dr. Nichols served as an advisor to the Virginia Health Reform Initiative and as the payment reform advisor to the State Innovation Model design effort. Dr. Nichols has also served as an Innovation Advisor to the Center for Medicare and Medicaid Innovation at CMS, and is now the Principal Investigator on a 5-year evaluation study of the CareFirst Patient Centered Medical Home program. Dr. Nichol's first job was teaching economics at Wellesley College from 1980-1991, where he became Associate Professor and Economics Department Chair, after receiving his Ph.D. in Economics from the University of Illinois in 1980. He received his B.A. from Hendrix College in Conway, Arkansas, and his M.A. in Economics from the University of Arkansas in Fayetteville.

Curriculum Lead, HPV: *Tira Hanrahan, MPH, Adolescent Immunization Coordinator, Virginia Department of Health*. As the Adolescent Immunization Coordinator (September 2016 – present), Ms. Hanrahan coordinates, develops, and implements initiatives and strategies for health care providers, public health stakeholders, and health district immunization staff. She also serves as the primary contact for the Centers for Disease Control and Prevention on all adolescent immunization projects. Ms.

Hanrahan co-developed and co-leads a statewide HPV immunization task force established to reduce the incidence of HPV associated cancers and to increase HPV immunization rates. Prior to this role, Ms. Hanrahan served as: a Program Evaluator for the Texas Medical Association, a Program Evaluator and Assistant Project Manager with Foundation Communities, and worked with the Austin/Travis County Community Health Improvement Plan during her graduate studies at the University of Texas School Of Public Health. Ms. Harahan values the importance of public health and understands the challenges underserved populations face through her undergraduate studies culminating in a Bachelor of Social Work, work experiences serving many different subpopulations, role as an AmeriCorps VISTA, and experience as a care coordinator for at-risk youth. Ms. Hanrahan maintains and continues to develop expertise in adolescent immunizations, program evaluation, program development, building community relationships with diverse groups, and leadership.

Curriculum Lead, Influenza: *Bethany McCunn, MPH, Deputy Division Epidemiologist, Virginia Department of Health*. As the Deputy Division Epidemiologist (September 2013 – present), Ms. McCunn ensures cases of vaccine preventable diseases are reported to the Centers for Disease Control and Prevention, assists with outbreak response, and oversees the Virginia Adult Immunization Program (VAIP). Ms. McCunn also collaborates with the Virginia Association of Free and Charitable Clinics (VAFCC) to provide seasonal influenza vaccine and for reporting influenza doses administered. Prior to this role, Ms. McCunn was the Field Operations Supervisor for the Virginia Immunization Information System (VIIS; June 2011 - September 2013) and oversaw recruitment, training, and retention of offices using VIIS. She also developed business rules, training plans, and acted as a liaison with organizations for the promotion of VIIS. Ms. McCunn began her tenure with the Virginia Department of Health in March 2009 as a field consultant and recruited, trained, and retained organizations to use VIIS. She also ensured data accuracy and worked closely with local health departments for VIIS outreach. Ms. McCunn graduated from West Virginia University with a Master in Public Health in 2006 and received a Bachelor's of Arts in Biology from Slippery Rock University in 2004. Prior to joining VIIS, Ms. McCunn worked for two years with the Emergency Medical Services for Children National Resource Center (EMSC-NRC) and one year with West Virginia University's Office of Health Services Research.

Maintenance of Certification and VHIN Director: *Ashley M. Edwards, Chief Innovation Officer, Virginia Center for Health Innovation*. At VCHI, Ms. Edwards manages several of the Center's core research and demonstration projects, including the Virginia Health Innovation Network and the Accountable Care Communities initiative of the Virginia Health Innovation Plan. Prior to joining VCHI, Ms. Edwards directed the launch of the Virginia Health and Wellness Passport project at the Virginia Community Healthcare Association and served as the Director of Programs and Quality Initiatives at the Medical Society of Virginia Foundation. In her role at the MSV Foundation, Ms. Edwards oversaw and expanded the Foundation's nationally recognized TO GOAL™ chronic disease quality improvement initiatives and maintenance of certification programs for primary care physicians across Virginia. In addition to her work in physician quality improvement, Ms. Edwards managed the DOC RxRelief medication

assistance program for the uninsured. Ms. Edwards is a graduate of James Madison University, where she studied Public Health and Health Information Systems. She has also completed coursework at the Institute for Healthcare Improvement in Leading Quality Improvement and received professional training and certification as a Health Coach, with a focus in nutrition, from the Institute for Integrative Nutrition. She is a graduate of the 2013 class of LEAD Virginia. In 2014, she was selected as one of Style Weekly's "Top 40 Under 40."

F. Key Milestones and Timeline:

August 1, 2017 – January 31, 2018 – Planning and Recruitment

- Staff hired
- Practice recruitment for control and cohorts 1 and 2 completed (300 practices)
- Maintenance of Certification Part IV approval secured through American Academy of Pediatrics, American Academy of Family Physicians, and the American Academy of Nurse Practitioners
- HPV and Influenza communities established on the Virginia Health Innovation Network
- HPV and Influenza digital educational materials and webinar information finalized and posted on the Virginia Health Innovation Network
- HPV patient education materials ordered and distributed by practice coaches
- Virginia Immunization Information System (VIIS) updates completed and feedback reporting functionality (VICAT) finalized
- VIIS data integrity monitors initiate contact, and copy practice coaches on their outreach, with all cohort 1 practices and provide training on VIIS and VICAT where requested
- Baseline immunization coverage rate reports run for the cohort 1 active intervention practices and provided to practice coaches

February 1, 2018 – January 31, 2019 – Active Intervention for HPV and Planning for Influenza Intervention

- Initial visit between practice coaches and practice staff to complete readiness assessment and office systems inventory (February 2018)
- HPV Kickoff Session (March 2018)
- Practice coaches continue to connect with HPV active intervention practices at least three times a month for the next 11 months (March 2018 – January 2019). This will include a minimum of two on-site visits to each practice and conducting at least two conference calls with all practices each month.
- Three HPV webinars held (April, June, August 2018)
- VIIS data integrity monitors will provide support in cleaning practice data (reduce duplicate/inactive clients, reduce pending records, and enter missing historical data) for active and control practices in cohort 1
- VIIS data integrity monitors will provide coverage rate reports on a monthly basis to cohort 1 active intervention practices

- Control and cohort 1 practices upload immunization data from their EHRs to VIIS on a monthly basis
- Influenza patient education materials ordered and distributed by practice coaches
- VICAT report modification completed in advance of influenza vaccine active intervention
- VIIS data integrity monitors initiate contact, and copy practice coaches on their outreach, with all cohort 2 practices and provide training on VIIS and VICAT where requested
- Baseline immunization coverage rate reports run for the cohort 2 active intervention practices and provided to practice coaches
- All Other Vaccines community established on the Virginia Health Innovation Network
- All Other Vaccines curriculum finalized and posted on the Virginia Health Innovation Network

February 1, 2019 – January 31, 2020 – Active Intervention for Influenza

- Initial visit between practice coaches and practice staff to complete readiness assessment and office systems inventory (February 2019)
- Influenza Kickoff Session held for cohort 2 (March 2019)
- Practice coaches continue to connect with Influenza active intervention practices at least three times a month for 11 months (March 2019 – January 2020). This will include a minimum of two on-site visits to each practice and conducting at least two conference calls with all practices each month.
- Three Influenza webinars held (April, June, August 2019)
- VIIS data integrity monitors will provide support in cleaning practice data (reduce duplicate/inactive clients, reduce pending records, and enter missing historical data) for active and control practices in cohort 2
- VIIS data integrity monitors provide coverage rate reports on a monthly basis to cohort 2 active intervention practices
- Control and cohort 2 practices upload immunization data from their EHRs to VIIS on a monthly basis
- At least one journal publication submission completed by HPV Medical Director and Evaluation Lead (January 2020)

February 1, 2020 – July 31, 2020 – Final Evaluation

- At least one journal article submission completed by Influenza Medical Director and Evaluation Lead (April 2020)
- Final evaluation report completed by the Evaluation Lead and submitted to Merck with final report

G. Deliverables and Enduring Materials:

- During the planning and recruitment phase, the Virginia Department of Health will finalize an immunization coverage rate report and will prioritize its use by the *Virginia Vaccinates* practices, and then eventually by all Virginia practices connected to the Virginia Immunization Information System. Easy access to this benchmarking tool offers enormous promise for long-term behavior change by Virginia's medical professionals.
- Additionally during the planning phase, the *Virginia Vaccinates* collaborative will prepare a one-page Virginia-specific briefing detailing how participation in an immunization registry and improvement in immunization coverage completion rates will assist providers in earning maximum financial incentives from their health plan contracts.
- Both the HPV and influenza interventions will launch with a one-day educational kickoff session for participating providers featuring presentations from three national experts. These sessions will be recorded and made available via webinar on the Virginia Health Innovation Network (VHIN) platform. There is no charge to access the VHIN or the webinars.
- Additionally, during the course of each intervention, three subject matter webinars will be recorded and shared with project participants. This brings the total number of webinars completed to 8 (4 for HPV and 4 for Influenza).
- Each participating practice will receive *Virginia Vaccinates* HPV and influenza brochures, magnets, reminder/recall postcards, and informational patient videos to display in waiting rooms and/or send to patients/parents as appropriate. These will be prepared and distributed during the planning and recruitment phase.
- Each intervention will utilize the VHIN to develop a Virginia-specific FAQ for providers on HPV and influenza by tracking exchanges by project faculty, coaches, and participating practices in the online communities.
- Following the program, VCHI staff will continue to post educational materials and host a series of webinars addressing opportunities to improve performance on Diphtheria, Hepatitis A, Hepatitis B, Herpes Zoster (Shingles), Measles, Meningitis, Mumps, Pertussis, Pneumococcus, Polio, Rotavirus, Rubella, Tetanus, and Varicella vaccines.
- VCHI will ensure that the quality improvement work undertaken by participating pediatricians, family physicians, and nurse practitioners addresses each specialty's Part IV maintenance of certification requirements and is submitted for approval. We anticipate that at least 50% of the participating providers in the active interventions (225) will be interested in securing Part IV maintenance of certification approval.
- During the course of both interventions, the project faculty and coaches will identify and share an online toolkit of already existing non-branded HPV and

influenza resources for clinicians and patients that are determined to be of the highest quality. While none of these resources will be new, we have found through our previous learning collaboratives that there is considerable value in having a small group of experts review all available materials, select the most beneficial, and share them directly in the project communities' workspace.

- A final evaluation report on the success of the *Virginia Vaccinates* initiative will be prepared and submitted to the funder by July 31, 2020.

Project Evaluation:

The quantitative evaluation of an intervention with random assignment of practices to treatment and control groups is relatively straightforward. The sample sizes for HPV and influenza were selected to provide sufficient power of test to detect a 30% change in HPV initiation rates, a 10% change in HPV completion rates, and a 10% change in influenza rates, assuming baseline variances in performance across practices that have been observed in the literature. The design is intent to treat and will entail comparing treatment vs. control means, after adjusting for key practice characteristics that we can measure with a baseline participation / recruitment survey. For example, at the time of recruitment we would require participants to report FTE of clinicians in the practice, average payer mix (public, private, uninsured), hospital affiliation or independent, and zip code so that we could append sociodemographic characteristics of their neighborhood to control for race, ethnicity, income, and urban/rural differences that might affect baseline vaccination rates.

The VDH will collect the vaccination performance data from the practices as part of their new VIIS, and GMU staff will work with VDH staff to develop multiple regression statistical models with the practice-level data that will answer two fundamental questions:

(1) Did the intervention improve HPV and influenza vaccination rates, for girls, boys, and adults respectively?
(2) Which practices improved performance the most, pediatric, family practice, or FQHCs?

Qualitative focus groups with small sample of each type of practice will then shed light on the follow up questions:

(3) Which elements of the intervention were most valuable to the participating practices?
(4) WHY did some practice types improve performance more than others?

The quantitative results will help us identify which practices to seek out in each category, among both high and low performers.

Anticipated Challenges and Potential Solutions:

From our current experience with our AHRQ *EvidenceNow: Primary Care Transformation* work, we have learned that for a variety of reasons, a portion of practices that start the intervention will not finish. Essential practice staff leave or get sick, practice ownership changes, and technology initiatives get in the way of timely reporting. We have anticipated that we may face a retention challenge and have over-recruited for both the control and intervention groups to ensure that we will still have sufficient statistical power to detect expected impacts even with a loss of 10-20% of our originally recruited practices.

We have also learned that not all promising new technology solutions, such as the Virginia Immunization Coverage and Assessment Tool, provide front line users with the functionality that is anticipated at the time of vendor selection. For this reason, we have allotted some additional funding to make adjustments to this tool as it is tested by our participating practices.

The six-month interval between HPV vaccine doses creates challenges measuring HPV completion, during the active HPV intervention, of adolescents who initiate the series of HPV vaccine after June of 2018. VDH will rerun HPV completion rates of the practices enrolled in the HPV intervention by the 3rd quarterly report in 2019. This potential solution will determine the impact of the HPV intervention with the inclusion of adolescents who initiate the series in January of 2019 and offer a measure of sustainability to the success of the HPV intervention.

Plans for Publishing and Dissemination:

Our co-medical directors and evaluation lead will work together to publish results for both the HPV and the influenza interventions. The expectation is that there will be a minimum of two published articles on our intervention.

For HPV, targeted journals include:

- Pediatrics, Journal of the American Academy of Pediatrics
- AAP News
- Adolescent Medicine: State of the Art Reviews
- Journal of Adolescent Health
- Journal of Vaccines and Vaccination

For influenza, targeted journals include:

- American Family Physician
- Family Practice Management
- Annual of Family Medicine
- Journal of Vaccines and Vaccination

Additionally, *Virginia Vaccinates* will be featured prominently at the annual Virginia Population Health Summits (2018 HPV; 2019 Influenza), an event drawing 300-400 attendees and co-sponsored by VCHI and VDH.

Project Budget:

Staffing	Year 1	Year 2	Year 3
Project Director	57,720.00	59,451.60	61,235.15
Project Manager	54,027.00	55,647.81	57,317.24
Medical Director HPV	13,000.00	13,000.00	6,500.00
Medical Director Influenza	6,500.00	13,000.00	13,000.00
Evaluation Lead	85,000.00	85,000.00	125,000.00
HPV Curriculum Director	inkind	inkind	inkind
Influenza Curriculum Director	inkind	inkind	inkind
Maintenance of Certification/VHIN Manager	27,838.00	28,673.14	29,533.33
3 Practice Coaches	211,300.00	217,639.00	91,079.00
3 VIIS Data Integrity Monitors	143,000.00	143,000.00	57,200.00
Financial Manager	19,200.00	38,400.00	19,200.00
Technology Platforms for Providers			
OID Connections	9,000.00	0.00	0.00
VICAT Enhancements	30,000.00	6,500.00	30,000.00
Communities Created on VHIN	15,000.00	10,000.00	10,000.00
Conference Calls	2,400.00	4,800.00	2,400.00
Cell phone coverage for Practice Coaches	3,000.00	3,000.00	1,200.00
Webinar Development	1,500.00	1,500.00	0.00
Laptops for Practice Coaches	5,400.00	0.00	0.00
GoToMeeting Webinar Accounts (5)	5,000.00	5,000.00	0.00
Kickoff Sessions for Providers			
Speaker Fees	1,500.00	1,500.00	0.00
Speakers Travel and Lodging	3,600.00	3,600.00	0.00
Room Rental and AV	4,500.00	4,500.00	0.00
Binders	7,500.00	5,000.00	0.00
Name Badges	300.00	200.00	0.00
Patient/Parent Materials			
Brochures	10,400.00	0.00	0.00
Refrigerator Magnets	9,200.00	0.00	0.00
iPads to Play HPV and Influenza info videos	39,000.00	0.00	0.00
Stock Photography Purchase	500.00	0.00	0.00

Graphic Design Assistance	1,500.00	0.00	0.00
Recall Postcards	8,600.00	0.00	0.00
Evaluation Support			
VIIS upload reimbursement	90,000.00	165,000.00	75,000.00
Postage for VIIS upload reimbursements	882.00	1,617.00	735.00
Clinician of the month recognition gift cards	300.00	600.00	300.00
Va APCD Data Purchase and Analysis	30,000.00	30,000.00	90,000.00
Travel	8,500.00	10,125.00	2,250.00
Indirect (10%)	90,516.70	90,675.36	67,194.97
Total Requested from Merck	995,683.70	997,428.91	739,144.70
Total Activity Cost (Merck + inkind)	1,030,683.70	1,032,428.91	774,114.70

Project Budget Explanation:

Staffing:

VCHI: The Project Director (.25 FTE), Project Manager (.75 FTE), Maintenance of Certification & VHIN Manager (.25 FTE), and Practice Coaches (3 FTE) will all be employed by the Virginia Center for Health Innovation. Budgeted amounts for each position include salary and a benefits package that includes: retirement contribution (10% of salary); health insurance contribution (13.35% of salary up to a maximum contribution of $16,000 per year); and federal taxes (7.65% of salary). Assumes an annual salary/benefit increase of 3 percent in Years Two and Three. The lead practice coach will be employed for the first 30 months of the grant, and the two new practice coaches will be employed for 27 months and 15 months respectively, as we will need fewer hours of coaching for the influenza intervention, as it will have 50 fewer active intervention practices than the HPV intervention. Practice coaches will not be needed at all during the final evaluation phase of the project.

Subcontractors to VCHI will include George Mason University, the Virginia Department of Health, Virginia Health Information, two physician leads, and a financial manager.

The subcontract to George Mason University (totaling $295,000 over three years) will provide salary and benefit support for the lead evaluator (6-14% FTE) and a Ph.D. level graduate research assistant (50% FTE) for each of the three years of the project. The primary tasks are to design the statistical evaluation of the intervention, including randomizing the practices after they are recruited, specifying multiple regression models to test for impact, working with the VDH to coordinate the data acquisition and storage,

and helping to manage the analytic data base as it is built over time, including adding variables from the surveys done at recruitment and geographically relevant control variables linked to the analytic data set from public sources (for example, census tract income and racial composition averages). In addition, focus groups of intervention participants to learn which features of the program were most and least useful from their perspective. Preliminary statistical work, to be completed in year two, will help us identify higher and lower performers who will then be recruited for the focus group study.

The subcontract to the Virginia Department of Health (totaling $409,700 over three years) will provide salary and benefit support ($343,200) for three full-time dedicated VIIS data integrity monitors (two monitors will be needed during months 1-6, three will be needed during months 7-18, and two will be needed for months 19-30, to correspond to the number of active intervention practices in a given period), as well as funding to support enhancements to the Virginia Immunization Coverage Assessment Tool (VICAT) ($66,500 over three years). VDH is fully supporting the initial purchase cost of VICAT ($180,000), the additional funds requested are for enhancements and customizations that may prove necessary to maximize the tool's benchmarking utilization by participating faculty, coaches, and primary care practice staff. VDH is also contributing the expertise of its Adolescent and Adult Immunization Coordinators to the *Virginia Vaccinates* collaborative, specifically to review curriculum content, provide pre-existing handouts/information from reputable sources to supplement webinar content as developed by VCHI/Medical Directors/Practice Coaches, participate in webinars and provide follow-up information. The expertise of the Adolescent and Adult Immunization Coordinators will be as an in-kind contribution.

The subcontract to Virginia Health Information will cover an annual data use agreement for access to the Virginia All Payer Claims Database ($30,000 per year) as well as 450 hours of analytical assistance from the APCD manager, to assist with the project's final evaluation ($60,000).

The current presidents of the Virginia Chapter of the American Academy of Pediatrics and the Virginia Academy of Family Physicians have agreed to serve as co-medical directors for the *Virginia Vaccinates* initiative. As our project will first focus on HPV and then on influenza, we have budgeted more time for the Pediatric medical director in Years One and Two (2 hours per week @ $125/hour), and less in Year Three (one hour per week @ $125/hour) and more time for the Family Physician medical director in Years Two and Three (2 hours per week @ $125/hour) and less time in Year One (1 hour per week @$125/hour).

We have also budgeted for the services of a financial manager (a CPA who currently serves as the contractual Fiscal Director for VCHI) to assist with grant financial management and processing practice reimbursements for VIIS data submissions. We anticipate this will require 40 hours a month @ a rate of $80/hour.

Technology:

In addition to the VICAT enhancements mentioned above, technology expenses will include:

- The cost of purchasing one-time OID connections to Virginia's Health Information Exchange for participating practices that do not yet have them. OID connections cost $100 each and we anticipate that 30 percent of practices will need them. In Year One, this means 90 practices will require support, at a cost of $9,000.
- The cost of adding three new project communities to the VHIN and adding at least 400 new users to the platform ($5,000 to create the new communities in Year One and then $10,000 per year in network lease and maintenance expenses).
- The cost of conducting two conference calls with the coaches, faculty, and all of the participating practices each month at an estimated cost of $200 per call, starting at month 6 and ending at month 30 ($2,400 in Years One and Three and $4,800 in Year Two).
- The cost of cell phone coverage for the three practice coaches at a cost of $100 per month per coach ($3,000 for Years One and Two and $1,200 for Year Three).
- The cost of webinar production for eight webinars, four for HPV ($2,000 in Year One) and four for influenza ($2,000 in Year Two), at a cost of $500 each.
- The purchase of laptop computers for the three practice coaches at a cost of $1,800 each in Year One.
- The purchase of five GoToMeeting Accounts (for the three practice coaches and two of the VIIS data integrity monitors) at an annual cost of $1,000 per year per account for the first two years.

Kickoff Sessions for Providers:

Each of the two active interventions will launch with a full day Kickoff session where participants will learn from national experts, network with their colleagues engaged in the learning collaborative, and learn to use the VHIN. Expenses for the Kickoff sessions will include:

- Honorariums of $500 each for three speakers per Kickoff session (total of $1,500 in Year One and $1,500 in Year Two).
- Travel and Lodging for three speakers per Kickoff session at a cost of $1,000 each (total of $3,000 in Year One and $3,000 in Year Two).
- Room rental and AV expenses (audio and video to record each session as an enduring webinar) for each Kickoff session are estimated at $4,500.

- Each of the 300 participants in the first session and 200 participants in the second session will also require a binder which includes all session printed materials (at a cost of $25 per binder, for a total of $7,500 in session one and $5,000 in session two) and a name badge (at a cost of $1 each, for a total of $300 in session one and $200 in session two).

Patient/Parent Materials:

A successful practice intervention will require behavior change by both providers and patients. To facilitate HPV patient education, we plan to implement an approach that was successful in Tennessee, known as the *Bug Your Doc* campaign. We have received permission to use this campaign's tested materials, with slight modifications to reflect a *Virginia Vaccinates* brand. We will provide participating practices with:

- *Bug Your Doc* educational brochures that can be mailed to patients in advance of a vaccination opportunity appointment and can also be available at the time the patient/parent checks in for a scheduled appointment. We anticipate ordering 20,000 brochures at a cost of $10,400.
- *Bug Your Doc* refrigerator magnets that can be sent home with patients/parents with a reminder about the need to complete a second dose of the HPV vaccine. We anticipate ordering 15,000 magnets at a cost of $9,200.
- *Bug Your Doc* recall postcards that can be mailed to patients that have received the first dose of the HPV vaccine and need to complete the second dose. We anticipate ordering 20,000 postcards at a cost of $4,300.
- One iPad per participating practice, to be kept at the front desk and distributed to age appropriate patients and their parents right before they go back to see their clinician. The iPad will be preloaded with a short HPV informational video which details information about the cancer prevention benefits of the HPV vaccine. We anticipate ordering 150 iPads for the HPV intervention practices, at a cost of $260 each, for a total cost of $39,000.

We do not anticipate that we will need this same level of patient education for our influenza intervention. Research has shown that patients are familiar with the influenza vaccine and generally do not need as much information regarding its merits. Moreover, only one dose is required, so the need to emphasize multi-dose completion does not exist. Instead, our focus will be on making certain that clinicians are taking advantage of all available immunization opportunities at the point of care. For this reason, we have only budgeted $4,300 for 20,000 influenza reminder postcards. The iPads, preloaded with an informative video about the importance of receiving the influenza vaccine, will have already been distributed to all of the participating practices during their participation in the HPV intervention.

We will need to tailor all of the existing educational materials to the *Virginia Vaccinates* brand, so we have budgeted an additional $1,500 for graphic design support and $500 for stock photography purchases.

Evaluation Support:

Practice connectivity to Virginia's immunization registry, immunization data submission, and review of immunization completion reports will be essential to the success of *Virginia Vaccinates*. For this reason, we believe it is beneficial to provide our participating practices with nominal compensation for completing these data requirements. Our plan is to reimburse each practice $50 a month for submitting and reviewing their data. In Year One, this would mean 300 practices would submit and review data for 6 months (months 6-12) at a total cost of $90,000. In Year Two, all 300 practices would be submitting data for months 13-18, and then 250 practices for months 19-24 for a total cost of $165,000. In Year Three, 250 practices would be submitting data for months 25-30, for a total cost of $75,000.

Postage will be required to send out reimbursement checks to participating practices for the completion of required data submissions. At the current postage rate of $.49 per piece, this will cost $882 in Year One (300 practices for 6 months), $1,617 in Year Two (300 practices for 6 months and 250 practices for 6 months) and $735 in Year Three (250 practices for 6 months).

Because completion of a Maintenance of Certification QI project is not a relevant participation incentive for physician assistants, nurses and medical assistants, we would also like to establish a targeted recognition program for these individuals who do exemplary work with *Virginia Vaccinates*. We are including $1,200 in the budget to purchase 48 $25 gift cards, which will be awarded to 2 individuals each month of the active intervention.

Travel:

In Year One, we have budgeted $8,500 for travel (to support both mileage and an occasional hotel overnight) for the practice coaches and VIIS data integrity monitors to engage directly with the participating practices (this will be needed primarily during months 3-12). We have increased this amount slightly in Year Two to $10,125 to reflect a full twelve months of necessary travel. In the final year of the initiative, much less travel is anticipated, as there will only be 100 active practices and they will only be engaged for the first six months of Year Three. For this reason, we are only budgeting $2,250 for the remaining four staff for Year Three.

Indirect:

As the project lead and fiscal agent, VCHI charges an indirect fee of 10 percent.

Proposed Payment Schedule:

Advance quarterly payments would seem most efficient. Given this premise, VCHI proposes the following payment schedule:

August 1, 2017	$248,921
November 1, 2017	$248,921
February 1, 2018	$248,921
May 1, 2018	$248,921
August 1, 2018	$249,358
November 1, 2018	$249,357
February 1, 2019	$249,357
May 1, 2019	$249,357
August 1, 2019	$184,787
November 1, 2019	$184,786
February 1, 2020	$184,786
May 1, 2020	$184,786

L. Scalability and Sustainability:

While the provision of targeted practice coaching will be limited to the two-year intervention period, we anticipate that much of the positive behavior change facilitated by the *Virginia Vaccinates* project will be leveraged into long-term gains. For example, practice recruitment will be done with an eye to including a few practices from each of Virginia's health systems, geographic regions, and from the association for Federally Qualified Community Health Centers, so that we are able leverage these sites' learning with their peers by having participants share best practices with others within their systems or networks. Additionally, at the conclusion of year three of the initiative, many of the project resources that are created and captured on the online platform, the Virginia Health Innovation Network, will be made available to any interested Virginia practice at no charge. In an effort to expand upon the constructed online collaborative platforms, all Virginia practices engaged in the Virginia Health Innovation Network will be encouraged to engage in a series of educational materials and webinars addressing opportunities to improve performance on Diphtheria, Hepatitis A, Hepatitis B, Herpes Zoster (Shingles), Measles, Meningitis, Mumps, Pertussis, Pneumococcus, Polio, Rotavirus, Rubella, Tetanus, and Varicella vaccines. These webinars will be offered to all participants for at least one year following the completion of the active intervention and will be maintained by VCHI staff. Perhaps most importantly, advances made to the Virginia Immunization Information System and the Virginia Immunization Coverage Assessment Tool will be maintained by VDH and made available to all health care providers so that they can continuously review and act on their immunization completion reports.