ROANOKE CITY HEALTH DEPARTMENT
COMMUNITY VACCINATION UPTAKE STRATEGIC PLAN

By

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Approved by:

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Abstract

The aim of this paper is to describe the process of developing a 5-year strategic plan to decrease Roanoke City Health Department (RCHD) immunization clinic no-show rates for children and to improve childhood universal vaccination coverage by 1) identifying and eliminating barriers associated with the under-immunization of children in certain minority groups, 2) enhance RCHD services offered to help decrease missed immunization opportunities, and 3) collaborate with community pediatric health care providers for continuity in service delivery. The process began by building upon my MPH practicum experience from the Gillings School of Global Public Health of the University of North Carolina whereby I developed strategic action steps to increase immunization rates through interventions for culturally diverse populations. Utilizing two public health core competencies, leadership and diversity/culture, and with a clear understanding of the RCHD’s mission I was part of a team at RCHD that began this strategic planning process by researching federal, state, and local best practices to increase immunization rates with the intention of developing an applicable strategic plan. The strategic planning process made use of guidance from the Advisory Committee on Immunization Practices (ACIP), the Centers for Disease Control and Prevention (CDC) and Healthy People 2020 guidelines and recommendations for universal vaccinations for children entering kindergarten. The goal of these agencies is to achieve and maintain effective vaccination coverage levels for 90% of children aged 19-35 months by the year 2020 (Healthy People, 2010). However, in Roanoke City, Virginia this goal has not been met for area children. Consequently, the RCHD formed an internal group, Community Health Outreach Improvement Committee (CHOICE), to further investigate why the vaccination coverage levels were not being met. CHOICE discovered Roanoke City to be a culturally diverse city where a large proportion of citizens fall within the low income range. Subsequently, area children are offered low-cost or no-cost vaccines through the health department and other community health care facilities. CHOICE assessed immunization clinic no-show trends to help identify barriers to care and look for opportunities for improvement to service delivery. Recent trend data indicate there has been no change in the RCHD’s 20-30% immunization clinic no-show rates over the past year. Further analysis of these data indicate a need for interventions to address missed vaccination opportunities, eliminate language and transportation barriers, and an increased commitment for collaboration with other community child health care providers. Interventions were developed that include combining Women, Infant, and Children (WIC) clinics with immunization clinics to help decrease missed opportunities, developing language-specific educational materials, and promoting all area providers’ access to the Virginia state-wide vaccination database, Virginia Immunization Information System (VIIS). Future planning includes implementing these interventions and measurable objectives. Additionally, this will include combining clinics to enhance vaccination coverage and broadening community involvement to seek support for vaccination opportunities. These interventions and future planning efforts do come with challenges that are still to be met; these include budgetary constraints and a lack of perceived benefits and non-adherence to the implemented interventions by both patients and providers. This strategic planning process and future planning activities are summarized in this master’s paper.
Introduction

Community Health Outreach Improvement Committee (CHOICE), a group formed August 2011 from various disciplines at the Roanoke City Health Department (RCHD), developed a strategic plan that provides the RCHD with a five-year roadmap for vaccine delivery services and uptake (rate of persons vaccinated in a population), and organization development. CHOICE will review progress quarterly and will update the plan annually as needed.

This paper describes the multi-disciplinary effort to develop this strategic plan with broad involvement and guidance from management staff and workforce members, including me, as the epidemiologist on the team and additional workforce members: nurses, and administrative staff; and three staff members from the management team, the director, business manager, and accountant. This group met once a week to reflect on the mission, vision, core operating values, and to define the agency’s strategic direction. As the epidemiologist in the group, my role began by expanding on knowledge learned from coursework and my practicum experience as part of my MPH degree program at the Gillings School of Global Public Health of the University of North Carolina (UNC). During my practicum I developed strategic action steps to increase immunization rates through interventions for culturally diverse populations.

An important goal of mine was to apply my learning from UNC to help lead the group in the development and implementation of a shared vision to produce change in an intended public health outcome within culturally diverse communities. The management staff, directed by budgetary allowance, helped direct the agency’s capabilities and subsequent priorities. The
workforce members helped coordinate the planning process and provided important support and analysis to complete this plan.

The goal of this strategic plan and subsequent intervention objectives is to a) decrease Roanoke City immunization clinic no-show rates, b) achieve and maintain effective vaccination coverage levels for universally recommended childhood vaccines for Roanoke City kindergartners and sixth grade students, and c) identify and eliminate barriers associated with the under-immunization of Roanoke City children in certain minority groups. To comply with national childhood vaccination standards and to provide measurable objectives and goals that apply at the national, state, and local levels, CHOICE decided to adhere to the directives set forth by the Centers for Disease Control and Prevention (CDC) and Healthy People 2020 that for each birth cohort vaccinated with the routine immunization schedule-DTap, Td, Hib, Polio, MMR, HepB, and Varicella vaccines—society saves 33,000 lives, prevents 14 million cases of disease, reduces direct health care costs by $9.9 billion, and saves $33.4 billion in indirect costs (Healthy People 2020, 2011).

Despite many recent advances in vaccine delivery, the goal for universal immunizations set forth by the first American Academy of Pediatrics (AAP) policy statement in 1977 has not been reached (American Academy of Pediatrics, 2003). In 2010, only 74.9% of U.S. toddlers 19 to 35 months of age had received their basic immunization series of 4 doses DTaP, 3 doses IPV, 1 dose MMR, 3 doses Hib, 3 doses of HepB, and 1 dose of varicella vaccines (4:3:1:3:3:1 series) (MMWR, 2011). Vaccines-specific coverage also varied by race. For children receiving the combined series, coverage for Caucasian children was lower (73.6%) than for other races,
followed by Asian (74.4%), African-American (74.5%), two + races (75.8%), and Indian/Alaska and Hispanic at 77.2%. (MMWR, 2011).

Coverage remains lower among children living below the poverty level (73.5%) as compared to those living at or above the poverty level (75.5%), however birth dose of HepB was higher among children living below poverty level (67.2%) as compared to children at or above poverty (62.8%) (MMWR, 2011). Furthermore, studies show children of a racial or ethnic minority, or who live in inner-city or rural communities have lower vaccination rates than do children in the general population (AAP, 2003). Shefer, et al. conducted an evidence-based literature review on improving immunization rates and discovered a multi-component intervention consisting of reducing out-of-pocket costs, immunization intervention in WIC settings, and expanding access in health care settings had a positive effect on enhancing access to immunization services (Shefer, et al., 1999).

After years of steady decline, Virginia saw an improvement in 2010 with 74.2 % coverage for childhood immunizations that placed the state 25th best in the nation (Virginia Performs, 2012). Moreover, for the most recently recommended vaccines, such as Rotavirus, coverage in Virginia placed ninth in the U.S. at 66.9%, and 7.7% above the U.S. average of 59.5%. (CDC, 2011). However, only 13 states placed lower than Virginia (58.3%) with being below the U.S. average (64.1%) for ≥1 dose of HepB administered between birth and age 3 days. (CDC, 2011).

Local Health Departments (LHDs) offer vaccines as a cost-effective preventive service that is a core component of LHDs programs such as Refugee Health, School Physical, and annual Influenza programs. Virginia Health Departments’ Vaccines for Children program purchases 1.2
million doses of vaccine annually for an expected 584,000 program-eligible children (Virginia Performs, 2012). Beginning in 2006, Virginia immunization coverage is assessed annually by the Virginia Department of Health (VDH) and CDC to determine Virginia’s immunization rates for children at 19-35 months of age, for compliance at school entry, and sixth graders for middle school entry requirements (Virginia Performs, 2012). Fall 2011 school data show 3.5% and 15.4% of Virginian children are provisionally enrolled due to missing vaccines for public and private schools, respectively. Moreover, compliance with age-requirement vaccination coverage was 74.7% for kindergartners for school year 2010, for public and private schools combined, which is well below the national Healthy People 2020 objective goal of 95% (Virginia Performs, 2012). However the data show, for Virginian children 24 months of age, a compliance level higher than that of Healthy People 2020 objective of 90%, except for the one dose of varicella vaccine, at 87.7%, is slightly below the national objective (Virginia Performs, 2012).

To obtain baseline data, CHOICE conducted a community assessment including an internal organization assessment and interviews with several community stakeholders and a review of demographic and market data. The community and organizational assessments helped the RCHD assess both the challenges and opportunities it is likely to face over the next five years and helped create the choices reflected in this strategic plan.

The RCHD conducts immunization clinics each Tuesday of the month for Roanoke City children and adults. During the period January 1st through August 31st, 2011, 606 children <18 years of age were scheduled for routine immunizations. Initially, 132 (21.8%) of those scheduled were no-shows. No-shows were identified as patients who did not attend scheduled
Of the 132 no-shows, 64 either rescheduled within 6-months from original appointment or were walk-ins during Tuesday immunization clinics within 6-months from original appointment, and received routine vaccines (57 rescheduled; 7 walk-ins). Of the 68 (11.2%) that remained no-shows, 22 children (32.4%) were Caucasian, followed by 19 African-American (27.9%), 17 race unknown, nine Hispanic/Latino (13.2%), and one refugee child. While ‘refugee’ is obviously not a race, for the purpose of this analysis, and to help identify barriers to and gaps in service, all children coming through the refugee program (90% Bhutanese-Asian) are classified as refugee.

To improve vaccination clinic services, the RCHD included a “2011 Spring Break Vaccination Clinic” survey with each registration packet. Questions included 1) How did you hear about us? 2) Preference of clinic offerings? and 3) Would you want your child vaccinated for flu at their school during school hours? The health department had a 46.6% response rate (27/58). The data show 23 of the 27 respondents (85.2%) indicated they received notice of the spring break vaccination clinic opportunities through their children’s schools. Twenty respondents (74.1%) would prefer having their children vaccinated during school hours at their respective schools. At 44.4%, weekday morning was the preferred time of day to attend vaccination clinics, while weekend evening was the least preferred time of day at 7.4%.

Executive Summary

The Roanoke City Health Department agency mission is:

To reduce morbidity and mortality associated with vaccine-preventable diseases.
Background Information

The Advisory Committee on Immunization Practices (ACIP) was established under Section 222 of the Public Health Service Act (42 U.S.C §217a), and provides advice and guidance to CDC, regarding the most appropriate selection of vaccines and related agents for effective control of vaccine-preventable diseases in the civilian population (ACIP, 2010). ACIP specifically provides advice for the control of diseases for which a vaccine is licensed in the U.S. (ACIP, 2010). For each recommended vaccine, ACIP shall advise on appropriate route, dose and frequency; contraindications, precautions, and adverse events for use of the vaccine; and population groups/or circumstances in which a vaccine is recommended (ACIP, 2010).

As shown in Table 1 CDC recommends routine vaccination to prevent 17 vaccine-preventable diseases that occur in infants, children, adolescents, or adults (Appendix 1). However, neither CDC nor other federal agencies have laws that mandate state vaccination programs (CDC, 2011). Depending on the state, children must be vaccinated against certain diseases before entering public schools. Specifically, by the time a Virginian child enters into kindergarten she/he should have received the following doses of vaccines: 4/DTap; 2-3/Hib; 3/HepB (one birth dose); 2/MMR; 4/IPV; 2/Var; and 2-4/PCV (Table 2). Additional information on Virginia’s school-required vaccines and doses can be found in Appendix 2.

Abbreviations:

DTaP -- pediatric diphtheria and tetanus toxoids and acellular pertussis
Hib -- *Haemophilus influenzae* type b
HepB—Hepatitis B vaccine
MMR -- measles, mumps, and rubella
IPV -- inactivated poliovirus
Var—Varicella vaccine
PCV -- pneumococcal conjugate vaccine
Within the Federal Government, a Federal Interagency Workgroup (FIW) led the Healthy People 2020 development effort. The vision, mission, and overarching goals of Healthy People 2020 give guidance that are applicable at the national, state, and local levels for achieving better health by the year 2020 (Table 2). The FIW members include representatives from U.S. Department of Health and Human Service agencies as well as other lead Federal Agencies with the most relevant scientific expertise, including but not limited to, the Food and Drug Administration (FDA), National Institutes of Health (NIH), and CDC (Healthy People, 2012).

Healthy People 2020 is based on the accomplishments of four previous Healthy People initiatives:

- Healthy People 1990: Promoting Health/Preventing Disease: Objectives for the Nation
- Healthy People 2000: National Health Promotion and Disease Prevention Objectives
- Healthy People 2010: Objectives for Improving Health (Healthy People, 2012).

<table>
<thead>
<tr>
<th>Vision:</th>
<th>A society in which all people live long, healthy lives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mission:</td>
<td>Identify nationwide health improvement priorities;</td>
</tr>
<tr>
<td></td>
<td>Increase public awareness and understanding of the determinants of health, disease, and disability and the opportunities for progress;</td>
</tr>
<tr>
<td></td>
<td>Provide measurable objectives and goals that are applicable at the national, state, and local levels;</td>
</tr>
<tr>
<td></td>
<td>Engage multiple sectors to take actions to strengthen policies and improve practices that are driven by the best available evidence and knowledge; and</td>
</tr>
<tr>
<td></td>
<td>Identify critical research, evaluation, and data collection needs.</td>
</tr>
<tr>
<td>Overarching Goals:</td>
<td>Attain high-quality, longer lives free of preventable disease, disability, injury, and premature death.</td>
</tr>
<tr>
<td></td>
<td>Achieve health equity, eliminate disparities, and improve the health of all groups.</td>
</tr>
<tr>
<td></td>
<td>Create social and physical environments that promote good health for all.</td>
</tr>
</tbody>
</table>
Promote quality of life, healthy development, and healthy behaviors across all life stages.


There are 42 topic areas and nearly 600 objectives in Healthy People 2020 with more than 1,300 measures that have a reliable data source, baseline measure, and target for specific improvements to be achieved by the year 2020 (Healthy People, 2010). One topic area, Immunization and Infectious Diseases, whose goal is to increase immunization rates and subsequently reduce vaccine-preventable diseases, is the focus of this strategic plan and interventions. Specifically, this plan will concentrate on the following Healthy People 2020 Immunization Objectives and Target Measurements:

- **IID-7: Vaccination coverage among young children**

<table>
<thead>
<tr>
<th>Objective Text</th>
<th>Target Measurement (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Achieve and maintain effective vaccination coverage levels for universally recommended vaccines among young children</td>
<td></td>
</tr>
<tr>
<td>4 doses diphtheria-tetanus-acellular pertussis (DTaP) vaccine by 19 to 35 months</td>
<td>90</td>
</tr>
<tr>
<td>3 doses polio vaccine by 19 to 35 months</td>
<td>90</td>
</tr>
<tr>
<td>1 dose measles-mumps-rubella (MMR) vaccine by 19 to 35 months</td>
<td>90</td>
</tr>
<tr>
<td>3 doses Haemophilus influenzae type b (Hib) vaccine by 19 to 35 months</td>
<td>90</td>
</tr>
<tr>
<td>3 doses hepatitis B (hep B) vaccine by 19 to 35 months</td>
<td>90</td>
</tr>
<tr>
<td>1 dose varicella vaccine by 19 to 35 months</td>
<td>90</td>
</tr>
<tr>
<td>4 doses pneumococcal conjugate vaccine (PCV) by 19 to 35 months</td>
<td>90</td>
</tr>
<tr>
<td>2 doses hepatitis A vaccine by 19 to 35 months</td>
<td>60</td>
</tr>
<tr>
<td>A birth dose of hepatitis B vaccine (0 to 3 days between birth date and date of vaccination, reported by annual birth cohort)</td>
<td>85</td>
</tr>
<tr>
<td>2 or more doses rotavirus vaccine by 19 to 35 months</td>
<td>80</td>
</tr>
</tbody>
</table>

- **IID-8: Complete vaccination coverage among young children**

Increase the proportion of children aged 19 to 35 months who receive the recommended doses of DTaP, polio, MMR, Hib, hepatitis B, varicella and PCV vaccines | 80                     |
• IID-9: Percentage of children in the U.S. who received zero doses of recommended vaccines by 19-35 months

| Percentage of children in the U.S. who received zero doses of recommended vaccines by 19-35 months | 0.6 |

• IID-10: Vaccination coverage among kindergartners

| Maintain vaccination coverage levels for children in kindergarten |  
| DTaP vaccine (4 or more doses) | 95  
| MMR vaccine (2 or more doses) | 95  
| Polio vaccine (3 or more doses) | 95  
| Hepatitis B vaccine (3 or more doses) | 95  
| Varicella vaccine (2 or more doses) | 95  

Data Source: Healthy People 2020 Immunizations and Infectious Diseases

**Healthy People 2020** goals for immunization and infectious diseases are rooted in evidence-based clinical and community activities and services for the prevention and treatment of infectious diseases (Healthy People, 2010).

**Roanoke City, Virginia, History, Demographics, and Assessment**

Roanoke City is an independent city in the Mid-Atlantic U.S. state of Virginia and is the largest municipality in Southwest Virginia. It is located approximately 190 miles west of Richmond, 230 miles southwest of Washington, DC, and 240 miles west of Norfolk and serves as the principal trade, industrial, transportation, medical, and cultural center of western Virginia. Roanoke City, first called Big Lick was established in 1852 and chartered in 1874; in 1882 it became the town of Roanoke, and in 1884 it was chartered as the independent city of Roanoke (HUD, 2012). The name Roanoke is said to have originated from an Algonquian word for shell “money”, and is also the name of the river that bisected it—most likely where shells had come from—and the county (Willard, 2002).
Roanoke City is a five-time All American City and has a great deal to offer in terms of employment, education, and culture. The city has 49 official designated neighborhoods, grouped by the nine zip codes within its city limits:

Roanoke City, Virginia, 2009 and 2010:


Zip Codes: 24011,24012,24013,24014,24015,24016,24017,24018,24019

<table>
<thead>
<tr>
<th>Population, 2010:</th>
<th>Population, %, 2010:</th>
<th>Races, 2010:</th>
<th>Median resident Age, years, 2010:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>Female</td>
<td>White</td>
<td>Black</td>
</tr>
<tr>
<td>97,032</td>
<td>47.8</td>
<td>52.2</td>
<td>62,343</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>$36,422</td>
<td>20.9</td>
<td>VA=10.3</td>
<td>$127,700</td>
<td>Total: 23,316</td>
</tr>
<tr>
<td>5-9</td>
<td>5,688</td>
<td>2,939</td>
<td>2,749</td>
<td>Families: 23,487</td>
</tr>
<tr>
<td>10-14</td>
<td>5,171</td>
<td>2,677</td>
<td>2,494</td>
<td>Married w/children: 14,014</td>
</tr>
<tr>
<td>15-19</td>
<td>5,509</td>
<td>2,768</td>
<td>2,741</td>
<td>Single-parent: 9,473</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mode of transportation to work, 2010:</th>
<th>Private vs. Public school enrollment, 2009:</th>
<th>Estimated Public primary/middle schools enrollment, &gt;3 years, 2010:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method</td>
<td>Total</td>
<td>%</td>
</tr>
<tr>
<td>Drove car alone</td>
<td>35,045</td>
<td>79.9</td>
</tr>
<tr>
<td>Dat</td>
<td>4,775</td>
<td>10.9</td>
</tr>
<tr>
<td>Bus/Trolley</td>
<td>1,458</td>
<td>3.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taxi</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Walked</td>
<td>922</td>
<td>2.1</td>
</tr>
<tr>
<td>--------</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>Work at home</td>
<td>1,081</td>
<td>2.5</td>
</tr>
</tbody>
</table>

**Unemployment Rate, %, 2010:** 8.5  
VA=6.3

**Adult Obesity Rate, %, 2010:** 29.3  
VA=26.7

**Low-income Preschool Obesity Rate, %, 2010:** 15.6  
VA=18.6

**Major facilities and industry located in Roanoke City, VA, 2010:**

<table>
<thead>
<tr>
<th>Name</th>
<th>Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carilion Clinic</td>
<td>1000+</td>
</tr>
<tr>
<td>Roanoke City Public Schools</td>
<td>1000+</td>
</tr>
<tr>
<td>City of Roanoke</td>
<td>1000+</td>
</tr>
<tr>
<td>Carilion Professional Service</td>
<td>1000+</td>
</tr>
<tr>
<td>United Parcel Service</td>
<td>500-999</td>
</tr>
<tr>
<td>Advance Auto Parts</td>
<td>500-999</td>
</tr>
<tr>
<td>Wal-Mart</td>
<td>500-999</td>
</tr>
<tr>
<td>Virginia Western Community College</td>
<td>500-999</td>
</tr>
</tbody>
</table>


Source: reproduced from the U.S. Census Bureau [http://quickfacts.census.gov/qfd/states/51/51770.html](http://quickfacts.census.gov/qfd/states/51/51770.html)


The city of Roanoke employs nearly 45% of the area’s workers in a diversified economy that consists of health care and social assistance, retail trade, food service, and local government industries (HUD, 2012). Health care and social assistance services industry employs approximately 16.5% of all area workers (HUD, 2012). In 2008, the nation entered the current recession and the unemployment in Roanoke reached 9.5%. Currently, the city’s unemployment rate of 8.5% remains higher than the state of Virginia at 6.3%. According to the 1980 Census, the city experienced a population growth to 100,220 residents. A slow but steady decrease with each decade until the 2010 Census has resulted in a population of 97,032 (HUD, 2012). The 2000 Census indicated that Caucasian persons accounted for 69.4% of the population, while African-American and Hispanic/Latino persons accounted for 27.7% and 1.5%, respectively. A decade later, the 2010 Census indicates a decrease in the Caucasian population
at 64.2%, a 0.8% increase in the African-American population at 28.5%, with the largest increase in the Hispanic/Latino population at 5.5%. One important change in Roanoke City’s age distribution over the past decade includes an increase of 0.7% in the <5 year old population between the 2000 and 2010 Census, 6.5% and 7.2%, respectively.

Although population growth may be occurring, with the current economic circumstances, there has also been growth in the proportion of the population that falls within the low and moderate income range defined by the U.S. Department of Housing and Urban Development (HUD, 2012). This agency’s data show, following the 2000 Census, the proportion and actual number of low-moderate residents was 52.4%, or about 49,730 persons, and the percentage is projected to increase to 53.5% through 2013 (HUD, 2012). Children in families that meet certain income requirements can enroll in a federal funded program, Women, Infant, and Children (WIC), to obtain supplemental help with foods, health care referrals, and nutrition education (Virginia Department of Health, 2012). Currently, 1,977 (28.5%) of Roanoke’s children participate in Roanoke City’s three WIC sites; 913 of those are seen at the Roanoke City Health Department site (VDH, 2012).

**Direction and Results**

The strategic plan and intervention objectives included in this plan are the RCHD’s response to its understanding of what its customers value most about the agency and current opportunities and challenges for offering high quality services by providing low-cost vaccines for school-aged children in the communities for parents with barriers to obtaining children’s school required vaccines.
The five-year period of this strategic plan will be a time of assessing and developing the way in which the agency approaches its work. Simultaneously, the RCHD will take more of a leadership role in working with a broader array of community partners, organizations, and other stakeholders.

With a fresh perspective on its mission, understanding what it does well and the environment in which it operates, the RCHD will pursue the following strategic direction:

1. The RCHD will assess and strengthen its direct supports and services over time to ensure that they are state-of-the-art for working effectively with children and adults seeking services at the agency.

2. The RCHD will continue to assess community needs to identify barriers and gaps in service delivery.

3. The RCHD will take a leadership role in working with a range of providers, and additional stakeholders, to identify and meet the needs of children and adults in underserved populations.

4. The RCHD will further explore the feasibility of expanding the agency’s visibility in the communities it serves.

5. The RCHD will continue to seek funding sources so that it may enhance low-cost or no-cost opportunities to serve the underrepresented populations.
Goals

The following goals for the RCHD immunization program over the next five years are the agency’s response to the important issues identified during the community assessment and environmental scan that were completed as part of the strategic planning procedure. These goals provide a roadmap for fulfilling the strategic direction.

Service Delivery

The RCHD will provide school-mandated vaccine service delivery for school-aged children, either directly or through partnerships with or referrals to other providers in the following ways:

- Expanded opportunities within already established RCHD clinics (e.g., WIC, Refugee Health, and Immunization clinics)
- School Physical Clinics
- Spring Break Vaccination Week
- Off-site clinics

Human Resources

The RCHD will develop a competent and motivated workforce that actively promotes and delivers the agency’s vaccination mission.

Resource Development

The RCHD will be a highly visible agency that seeks mutual trust and respect from community members, current and future partnerships, and additional stakeholders.
Organization of the Strategic Plan

As noted above, this strategic plan is intended to be a management tool for the RCHD. This plan has two purposes. First, it presents the most comprehensive compilation of the plan and its component parts. It is a record of the strategic planning process reached by the management and staff. Second, it is an evolving document that lays the foundation for current vaccination uptake efforts, and will be used as a reference guide for future strategic planning efforts.

Five-year vision for the Roanoke City Health Department Immunization program

Context

In the year 2017, greater acceptance and visibility within the community, improved services with partnered and financial support, and increased recognition of the importance of school-mandated universal vaccines will improve childhood immunization coverage and help sustain high coverage levels that are critical to achieving on-going reductions in vaccine-preventable disease morbidity and mortality. At the same time, because of population growth and subsequent ethnic and racial diversity, the needs of underserved children and their families will remain extensive and varied. While significant strides have been made to achieve Healthy People 2020 universal vaccination coverage, it will require a continued push for community participation and cohesiveness to reach, and ultimately sustain, universal vaccination coverage for all children who reside in Roanoke City.
**Role and Immunization Program Services**

RCHD is a leader in advocating for all children to receive comprehensive and timely vaccines and for bringing together resources and services for Roanoke City children with disparities and barriers to support the national goal for universal immunizations. Specifically, the RCHD:

- Leads in collaboration of providers and community organizations and programs in Roanoke City in identifying needs, barriers, and gaps in services
- Directly provides immunization services that meet identified barriers and gaps
- Collaborates with and makes referrals to other high-quality service providers
- Leads additional advocacy efforts to ensure childhood vaccine services are provided either by the RCHD agency or other health care providers

The RCHD mission is:

**To reduce morbidity and mortality associated with vaccine-preventable diseases.**

RCHD mission statement reflects one major dimension that defines the purpose of the agency’s efforts and contributions toward universal vaccinations for school-aged children. The dimension is:

**Reduce morbidity and mortality** means ensuring children of all races and socioeconomic backgrounds will receive vaccines that prevent diseases.
Core Operating Values

The following core operating values influence the culture and public image of the RCHD as a leading effective community-based agency serving a wide variety of children and their parents.

Caring Attitude- The RCHD workforce demonstrates compassion and concern for disparate children and their families and, as part of this attitude, informs and empowers patients and their families.

Responsiveness- The RCHD works to find solutions that meet the needs of children and their families through direct service or referrals to other health care providers.

Diversity- The RCHD understands and embraces the diversity of various cultures, ethnicities, and races and promotes diversity in outreach measures used to educate and intervene.

Integrity and Accountability- The RCHD has the highest level of integrity in its administrative, service, and outreach activities, and remains steadfast in the accountability to those we serve.

Workforce Competencies- The RCHD aims for excellent, high quality services and approaches that underserved populations should expect and absolutely deserve.

Partnerships- The RCHD works with a wide variety of partners and advocates for collaboration among all partners and stakeholders.

Advocacy- The RCHD educates and empowers populations served and advocates for universal vaccinations for children and their families.

Financial Sustainability- The RCHD believes its work and services will be needed for many years into the future. Therefore, the agency strives to deliver its mission with thoughtful strategy choices that are cost effective and ensure sufficient financial resources.
The following is a brief summary of opportunities, threats, strengths, and weaknesses highlighted by management and staff of the RCHD Agency. This environmental scan represents the discovery, facts, and trends in the operating environment of the agency and is likely to affect the agency in its future work (Dess & Lumpkin, 2003).

**Strengths**-The RCHD key strengths include the agency’s demonstrated ability to provide high quality, low-cost or no-cost immunization services that help underserved populations live healthier lives. The workforce is committed and the services and programs offered are monitored for quality. When there is a challenge, management meets it through leading, empowering, and guiding the staff. The RCHD has a reputation amongst other health care providers as a leader and advocate for underserved populations.

**Weaknesses**-Significant federal, state, and local budget cuts have led to challenges to human resources, lack of structure for coordination among departments, inconsistent administrative and clerical support, and difficulty with supervision. There is a perceived need for improved management practices, increased technical training for current workforce, increased need for interpreters and language-specific materials and, in light of recent budget cuts and the lack of monetary raises, innovative ways to increase and sustain workforce moral. The need for greater visibility and acceptance within the community has also been discussed.

**Opportunities**-The opportunities considered most important include:

1. **Increasing visibility and community acceptance.** With the increased emphasis on mandatory school-required vaccines for school entrance and increased immunization financing through the Vaccines for Children (VFC) Program, a federal program that pays for and
distributes free vaccine to providers serving 1) Medicaid insured children, 2) uninsured children, 3) children with private insurance that does not cover immunizations, and 4) American Indian and Alaskan Native children, the opportunity exists for an increase demand for the vaccination services offered at the RCHD (Wood & Halfon, 1996).

Implications: Increased emphasis on mandated vaccines raises the community’s awareness of vaccines in general and empowers parents to seek out resources.

2. Increased need for interpreters and language-specific materials. Roanoke City is a melting pot of various ethnicities and racial groups and continues to be a culturally dynamic community. The Hispanic/Latino ethnic group has increased from 1.5% of the total population in 2000 to 5.5% in 2010 and the increase in the resettlement population of the Bhutanese refugees have created challenges and subsequent opportunities for health care providers who serve these populations. Partnering with local agencies that sponsor and provide interpreters is a critical component for successful programs at the RCHD as well as other healthcare settings, not only for assisting with interpretation, but also to help create and promote language-specific materials.

Implications: Increased awareness of non-biased, language-specific materials surrounding universal vaccines, programs, and opportunities being offered has the potential to increase the perceived importance of vaccinations and subsequently decrease the immunization clinic no-show rates. The RCHD could do more advertising and self-promotion within the community to reach various cultures, ethnicities and racial groups.
Threats-The threats considered most important include:

1. **Budget Cuts.** State budget cuts to programs create challenges to service delivery.

**Implications:** The RCHD should assess the real demand for its services, develop innovative measures to continue low- and no-cost vaccination services, and explore strengthening partnerships with other health care providers in the hopes of sharing the burden of service delivery.

2. **Staffing challenges and the cost of providing quality care.** It can be difficult to maintain a competent workforce including staff who can speak multiple languages.

**Implications:** Budget cuts and downsizing has made competencies and cross-training important components to almost all workforce personnel. However, to increase this demand places an extra financial burden for training. The RCHD needs to promote further no-cost state funded training opportunities for all staff.

**Strategic Direction**

Based on CHOICE’s understanding of the RCHD’s mission, core operating values, and the opportunities and threats in the current environment, the next three to five years will be a time of assessing and developing the agency’s approach to its work. Also, the agency will take a leadership role in working with stakeholders, partners, and seeking out additional community resources that enhance services offered.

- RCHD will review often and enhance its existing direct supports and services over time to ensure they work effectively to help strive for universal vaccination coverage among
children. The vaccination opportunities offered emphasize culturally diverse community participation.

- RCHD will further assess community needs to identify gaps or opportunities for shifts in service delivery. This assessment will serve as the baseline for expanding or adding new services. The emphasis on future vaccination programs will be the priority to ensure universal vaccination coverage for children entering kindergarten.

- RCHD will take a leadership role in working with community partners and other health care providers to identify and meet the needs that help provide integrated and cohesive vaccination services for underserved populations. The focus will be to ensure quality across services and eliminate duplication.

- RCHD will explore the feasibility of expanding the agency’s visibility in the community through increased advertisement and being more active and visible in a wide range of community initiatives thus highlighting the positive aspects of universal vaccination coverage. The emphasis will be on generating strong supporters for community participation throughout the communities served.

**Goals Areas**

Prevention of disease through immunization remains a priority for pediatric health care providers. With the implementation of the VFC Program and additional changes in vaccination financing and the expected increase in insurance payouts, great strides have been made toward universal vaccination coverage among children. However, certain populations remain at higher risk. Studies show that coverage levels for children aged 2 years remain lower among low-income Caucasian, African-American, and Hispanic/Latino children as compared to children of
the same races/ethnicities at or above poverty level (CDC, 2011). Research suggests failure to achieve childhood universal vaccination coverage can be attributed to ineffective provider practices that lead to missed opportunities. Insufficient public education, inadequate documentation of immunizations received, and financial barriers cause increases in individual out-of-pocket costs (AAP, 1995; Minkovitz et al., 2001).

Although the challenges appear daunting, low-cost opportunities exist to improve vaccine delivery and address the challenges in the future. In order to pursue the strategic direction described above, RCHD will fulfill the following goals and objectives:

**Service Delivery**

RCHD will provide low-cost or no-cost vaccines for children requiring up-to-date vaccines, either directly or through partnerships with or referrals to other service providers by developing interventions that enhance the following areas:

- stakeholder support
- missed opportunities
- patient education

**Objectives:**

A. **Stakeholder Support**

1. Partner with community pediatric health care providers to provide/receive accurate, up-to-date vaccination records.
2. Collaborate with Medicaid transportation services to ensure those without the ability to get to scheduled appointments can obtain low-cost or no-cost transportation.
3. Contract with the local bus transit system to receive bus passes to send to those that might otherwise miss appointments for a lack of transportation.

B. **Missed Opportunities**
1. Develop a pilot project to partner with the RCHD WIC clinics to provide vaccination delivery during patients’ WIC visits.
3. Continue for the second year in 2012 “Spring Break Vaccination Week” one week in April.
4. Develop plans for patient chart reviews and database searches for children with incomplete vaccinations.
5. Train staff for patient call-backs and recalls.
6. Develop language-specific appointment reminder letters to send to culturally-diverse populations, along with free bus passes, to help decrease clinic no-show rates.
7. Continue for the third year in 2012 with off-site vaccination clinics.
8. Develop a plan specific to the Bhutanese population (90% refugee population) to provide vaccination clinics at the Refugee Center.

C. Patient Education

1. Partner with the Department of Social Services (DSS) for patient education materials on public health insurance options.
2. Make mandatory Vaccination Information Sheets (VIS) and patients’ hand-held vaccination records be given to patients of the RCHD clinics: WIC, FP, STI, Immunization, and Refugee clinics.
3. Promote the further use of patient surveys to help identify barriers, needs, and gaps of populations in the community.
4. Delivery of language-specific education materials to racially/ethnically dense zip code areas.
5. Seek out opportunities with external agencies that offer interpreter services.

D. Service delivery and Capacity Building

1. The internal operating structure of the RCHD is currently being reorganized to increase available time to support vaccination outreach efforts and maximize efficiencies in using the agency’s resources.
2. Community assessments are conducted every 6 months to identify gaps, needs, and opportunities for shifts in service delivery.
3. National, state, and local level trends are reviewed every 6 months to identify gaps, needs, and opportunities shifts in service delivery.

Human Resources

The RCHD will continue to develop a customer-friendly, highly qualified and motivated workforce that actively delivers the agency’s mission.
Objectives:

1. The RCHD improves its capacity to attract and retain qualified direct care and support staff.
2. All members of the staff thoroughly understand the meaning of the mission and how his/her job contributes to achieving it.
3. Professional development is encouraged to strengthen and expand the supervisory and management capacity and opportunities among mid-level managers.
4. Professional development is encouraged to strengthen and expand the capacity of direct support and front-line office staff to be able to bridge the gap between community members and services offered.

Resource Development

The RCHD will work to become a highly-visible and well-respected agency within communities served.

Objectives:

A. Visibility

1. Use strategic communication and advertisement to facilitate an increase in targeted groups’ participation in vaccination clinics.

B. Well-respected

1. Promote exceptional customer service practices both internally and externally.
2. Improve patient areas to create a modern patient-friendly environment.

Limitations and Future Planning

The following is a summary of the anticipated limitations of interventions for increased universal vaccination coverage, and major focus of future planning activities for the vaccination programs at the RCHD.

Limitations
The refugee resettlement program is funded through the U.S. government and allows an allotted dollar amount per refugee that pays for a medical assessment including testing and vaccinations. In theory, the program generates funds that can be used to put back into the program for enhanced services such as extensive parasitic testing and some follow-up for problems identified. To help ensure refugees follow-up with vaccination appointments, the funds generated from the program would go toward purchasing bus passes that would be included in the reminder letter. However, measurement tools will need to be developed to assess whether the bus passes are being used as designed.

To ensure complete and up-to-date vaccinations for all area children, and to decrease duplication of vaccines, it is imperative that all community child health care providers are able to access the statewide vaccination database used in Virginia, Virginia Immunization Information System (VIIS). VIIS is an immunization registry for the state that documents all immunizations a person has received from all medical sources into one definitive, accurate record. The main purpose of this registry is to decrease the amount of incomplete immunization records which create an obstacle to universal vaccination coverage and to eliminate the unnecessary duplication of immunizations that is estimated to occur in 21% of Virginia’s children (VDH, 2011). One of RCHD’s largest community child health care provider partners, New Horizons Healthcare (NHH), does not yet have the capability to access VIIS. The current method for communicating vaccination information between agencies is done via phone, email, or fax by program coordinators (patients can walk into their local health departments to retrieve a copy of their vaccination records from front-desk support staff). This poses enormous challenges when trying to coordinate children’s vaccines across agencies and
ultimately leads to missed opportunities and duplication of services. However, the Virginia Department of Health is currently providing free VIIS training to all health care providers in the state with the expectation that all providers will utilize VIIS as their one-stop patient vaccination tracking system.

Future Planning

Future planning includes implementing interventions and all measurable objectives described above. Additionally, this will include combining clinics to enhance vaccination coverage and broadening community involvement to seek support for vaccination opportunities. These interventions and future planning efforts do come with challenges that are still to be met; these include budgetary constraints and a lack of perceived benefits and non-adherence to the implemented interventions by both patients and providers. Specifically future plans can be detailed as follows:

- The RCHD is planning to offer off-site clinics for WIC recipients at a local shopping mall. The immunization personnel plan to partner with this effort to enhance vaccination coverage, patient education, and broader community involvement.

- The RCHD will work to develop collaboration with area schools to seek support for vaccination opportunities. One goal is to send vaccination opportunity notices home with children’s report cards in advance as to enable parents enough time to schedule appropriately. This partnership has the potential for additional exciting opportunities to reach school-aged children.
• The RCHD will implement and promote further use of surveys to help enhance all services offered and to help identify gaps in service and additional needs of community children

• The research used in this strategic plan to improve immunization coverage levels will inform other research to help improve the use of additional clinical preventive services at the RCHD
### Appendix 1

#### Table 1: Recommended vaccines and dose ages

<table>
<thead>
<tr>
<th>Vaccines and Doses</th>
<th>Recommended Ages for Doses</th>
</tr>
</thead>
<tbody>
<tr>
<td>HepB-§1, HepB-2, HepB-3¶</td>
<td>Birth, 1-2 Months, 6-18 Months</td>
</tr>
<tr>
<td>DTaP-1§, DTaP-2, DTap-3, DTap-4, DTap-5</td>
<td>2 Months, 4 Months, 6 Months, 15-18 Months, 4-6 Years</td>
</tr>
<tr>
<td>Hib-1§§, Hib-2, Hib-3¶¶, Hib-4</td>
<td>2 Months, 4 Months, 6 Months, 12-15 Months</td>
</tr>
<tr>
<td>IPV-1§, IPV-2, IPV-3, IPV-4***</td>
<td>2 Months, 4 Months, 6-18 Months, 4-6 Years</td>
</tr>
<tr>
<td>PCV-1§§, PCV-2, PCV-3, PCV-4</td>
<td>2 Months, 4 Months, 6 Months, 12-15 Months</td>
</tr>
<tr>
<td>MMR-1†††, MMR-2†††</td>
<td>12-15 Months, 4-6 Years</td>
</tr>
<tr>
<td>Varicella-1†††, Varicella-2†††</td>
<td>12-15 Months, 4-6 Years</td>
</tr>
<tr>
<td>HepA-1, HepA-2</td>
<td>12-23 Months, &gt; 18 Months</td>
</tr>
<tr>
<td>Influenza inactivated¶¶¶</td>
<td>&gt;6 Months</td>
</tr>
<tr>
<td>LAIV (intranasal) ¶¶¶</td>
<td>2-49 Years</td>
</tr>
<tr>
<td>MCV4-1††††, MCV4-2††††</td>
<td>11-12 Years, 16 Years</td>
</tr>
<tr>
<td>MPSV4-1††††, MPSV4-2</td>
<td>2 Years, 7 Years</td>
</tr>
<tr>
<td>Td</td>
<td>11-12 Years</td>
</tr>
<tr>
<td>Tdap§§§§</td>
<td>&gt;11 Years</td>
</tr>
<tr>
<td>PPSV-1, PPSV-2¶¶¶¶</td>
<td>2 Years, 7 Years</td>
</tr>
<tr>
<td>HPV-1*****§, HPV-2, HPV-3†††††</td>
<td>11-12 Years, 11-12 Years (+2 months), 11-12 Years (+6 months)</td>
</tr>
<tr>
<td>Rotavirus-1§§§§§, Rotavirus-2, Rotavirus-3¶¶¶¶¶</td>
<td>2 Months, 4 Months, 6 Months</td>
</tr>
<tr>
<td>Herpes zoster******</td>
<td>&gt;60 Years</td>
</tr>
</tbody>
</table>

Data Source: Reproduced from MMWR General Recommendations on Immunization January 28th, 2011/60 (RR02);1-60. Found at: [http://www.cdc.gov/mmwr/preview/mmwrhtml/rr6002a1.htm?dup=rr6002a1_e](http://www.cdc.gov/mmwr/preview/mmwrhtml/rr6002a1.htm?dup=rr6002a1_e)

§ Combination vaccines containing the hepatitis B component are available. These vaccines should not be administered to infants aged <6 weeks because of the other components (i.e., Hib, DTaP, HepA, and IPV).
¶ HepB-3 should be administered at least 8 weeks after HepB-2 and at least 16 weeks after HepB-1 and should not be administered before age 24 weeks.

¶¶ For Hib and PCV, children receiving the first dose of vaccine at age ≥7 months require fewer doses to complete the series.
¶¶¶ If PRP-OMP (Pedvax-Hib, Merck Vaccine Division) was administered at ages 2 and 4 months, a dose at age 6 months is not necessary.

*** A fourth dose is not needed if the third dose was administered at ≥4 years and at least 6 months after the previous dose.
††† Combination MMRV vaccine can be used for children aged 12 months–12 years. See text for details.
One dose of influenza vaccine per season is recommended for most persons. Children aged <9 years who are receiving influenza vaccine for the first time or who received only 1 dose the previous season (if it was their first vaccination season) should receive 2 doses this season.

Revaccination with meningococcal vaccine is recommended for previously vaccinated persons who remain at high risk for meningococcal disease. (Source: CDC. Updated recommendations from the Advisory Committee on Immunization Practices (ACIP) for revaccination of persons at prolonged increased risk for meningococcal disease. MMWR 2009;58[1042--3]).

Only 1 dose of Tdap is recommended. Subsequent doses should be given as Td. For one brand of Tdap, the minimum age is 11 years. For management of a tetanus-prone wound in persons who have received a primary series of tetanus-toxoid-containing vaccine, the minimum interval after a previous dose of any tetanus-containing vaccine is 5 years.

A second dose of PPSV 5 years after the first dose is recommended for persons aged ≤65 years at highest risk for serious pneumococcal infection and those who are likely to have a rapid decline in pneumococcal antibody concentration. (Source: CDC. Prevention of pneumococcal disease: recommendations of the Advisory Committee on Immunization Practices [ACIP]. MMWR 1997;46[No. RR-8]).

Bivalent HPV vaccine is approved for females aged 10--25 years. Quadrivalent HPV vaccine is approved for males and females aged 9--26 years.

The minimum age for HPV-3 is based on the baseline minimum age for the first dose (i.e., 108 months) and the minimum interval of 24 weeks between the first and third dose. Dose 3 need not be repeated if it is administered at least 16 weeks after the first dose.

The first dose of rotavirus must be administered at age 6 weeks through 14 weeks and 6 days. The vaccine series should not be started for infants aged ≥15 weeks, 0 days. Rotavirus should not be administered to children older than 8 months, 0 days of age regardless of the number of doses received between 6 weeks and 8 months, 0 days of age.

If 2 doses of Rotarix (GlaxoSmithKline) are administered as age appropriate, a third dose is not necessary.

Herpes zoster vaccine is recommended as a single dose for persons aged ≥60 years.
## Appendix 2

### Table 2: Supplemental Guidance for School-required Vaccines  
March, 2012

Children vaccinated in accordance with either the current harmonized schedule or the harmonized catch-up schedules (including all minimum age and interval requirements) are considered appropriately immunized for school attendance.

<table>
<thead>
<tr>
<th>Antigen</th>
<th>Kindergarten</th>
<th>Sixth Grade</th>
<th>Trade Names</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diphtheria, Tetanus &amp; Pertussis vaccines (DTaP)</td>
<td>3 doses or DTaP - one on or after the 4th birthday</td>
<td>Same as for kindergarten</td>
<td>DTaP, Tetanus, Triplex</td>
</tr>
<tr>
<td></td>
<td>typically 5 are given by entry into kindergarten</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Tdap, Adboil, Bocvac</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Td, Dencvac</td>
</tr>
<tr>
<td>Tetanus, Diphtheria &amp; Pertussis vaccines (Tdap)</td>
<td>not applicable</td>
<td>One dose of Tdap (a different vaccine than DTaP)</td>
<td>Tdap, Adboil, Bocvac</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Td, Dencvac</td>
</tr>
<tr>
<td>Hepatitis B vaccine</td>
<td>2 doses</td>
<td>ALL minimum age &amp; interval requirements must be met</td>
<td>Engerix-B, Recombivax HB</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Same as for kindergarten</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human Papilloma Virus (HPV) vaccine</td>
<td>not applicable</td>
<td>3 doses for female students</td>
<td>HPV4, Gardasil</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>HPV2, Cervarix</td>
</tr>
<tr>
<td>Measles, Mumps &amp; Rubella vaccines</td>
<td>2 doses of measles and mumps: 1 dose of rubella</td>
<td>Only one dose of mumps-containing vaccine is required for those who would have been a member of kindergarten prior to 2010</td>
<td>MMR, M-M-R II</td>
</tr>
<tr>
<td></td>
<td>not usually a problem for children born in the US as 2 doses of MMR are typically given:</td>
<td>Same as for kindergarten</td>
<td>MMR, M-M-R II</td>
</tr>
<tr>
<td></td>
<td>foreign born children may have received single-antigen vaccines</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Measles only, Mumps only</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mumps only, Mumps only</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Rubella only, Meravac II</td>
</tr>
<tr>
<td>Antigen</td>
<td>Minimum Required</td>
<td>Notes</td>
<td>Minimum Required</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>------------------</td>
<td>--------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Polio Vaccine</td>
<td>4 doses - one on or after the 4th birthday</td>
<td>NOTE: a 5th dose is not necessary if the 3rd dose was administered at 4 years of age or older and at least 6 months following the previous dose</td>
<td>Same as for kindergarten</td>
</tr>
<tr>
<td>Varicella (chickenpox) Vaccine</td>
<td>2 doses/a child</td>
<td>1 dose required for those born on or after 1/1/97</td>
<td>Varivax</td>
</tr>
<tr>
<td>Combination Vaccines (contain at least one of the vaccines required for school)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pneumococcal (PCV) vaccine</td>
<td>Not required for kindergarten entry</td>
<td>only required for children in day care or head start programs</td>
<td>not required</td>
</tr>
<tr>
<td>Haemophilus Influenza b (Hib) vaccine</td>
<td>Not required for kindergarten entry</td>
<td>only required for children in day care or head start programs</td>
<td>not required</td>
</tr>
</tbody>
</table>

NOTE: 4 day grace period is allowed according to current recommendations for ALL antigens doses
* current schedule may be found at: http://www.cdc.gov/vaccineschedulesاكشنdefault.htm
* minimum age interval is May be found inicago/Attachment%201/The%20Pink%20Book.html

Source: Virginia Department of Health

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