A Community Health Needs Assessment
Prepared for Children’s Hospital of Richmond of the Virginia Commonwealth University Health System
By Community Health Solutions
June 2016
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Executive Summary

The vision of Children’s Hospital of Richmond of the Virginia Commonwealth University Health System is "to be a complete and supportive resource where children and their families find the medical and therapeutic services they need to thrive." With this vision in mind, Children’s Hospital of Richmond of the Virginia Commonwealth University Health System commissioned Community Health Solutions to conduct this community health needs assessment (CHNA).

The study focuses on the Children’s Hospital of Richmond of the Virginia Commonwealth University Health System service area of 51 zip codes adjacent to its six locations. Most of these zip codes fall within the counties of Chesterfield, Hanover, Henrico, King George, Powhatan, Spotsylvania and Stafford; and the cities of Colonial Heights, Fredericksburg, Hopewell, Petersburg and Richmond. The study region is shown in the map below. The study population for this CHNA is residents age 0-21 and their families. The results of the study include two primary components: a ‘Community Insight Profile’ and a ‘Community Indicator Profile. The Community Insight Profile is based on qualitative analyses of two surveys; one for community professionals, and one for parents/caregivers of Children’s Hospital of Richmond of the Virginia Commonwealth University Health System patients. The Community Indicator Profile is based on quantitative analysis of community health status indicators. This Executive Summary outlines major findings, and details are provided in the body of the report.
Part I. Community Insight Profile

In an effort to generate community input for the study, two Community Insight Surveys were conducted, one with a group of community professionals, and one with a group of parents/caregivers of Children’s Hospital of Richmond of the Virginia Commonwealth University Health System patients. The purpose of the surveys was to identify support needs for area families. The survey of community professionals was administered via an online survey tool, and the survey of parents/caregivers was administered during check-in/check-out at Children’s Hospital of Richmond of the Virginia Commonwealth University Health System facilities. Among the most commonly identified family needs in both surveys were supports for:

- Learning about the child’s health and developmental needs;
- Learning specific skills to care for the child; and
- Getting emotional support when the parents/caregivers start to feel overwhelmed.
- Communicating with service providers to help them understand what the child really needs;
- Getting help coordinating services for the child.

Survey respondents also identified additional support needs as described in more detail in Part I of the report.

Part II. Community Indicator Profile

The community indicator profile in Part II presents a wide array of quantitative community health indicators for the study region. To produce the profile, Community Health Solutions analyzed data from multiple sources. By design, the analysis does not include every possible indicator of community health. The analysis is focused on a set of indicators that provide broad insight into community health for children and families, and for which there were readily available data sources. To summarize:

- **Demographic Profile.** As of 2014, the study region included an estimated 412,473 individuals age 0-21. Compared to the Commonwealth of Virginia as a whole for this age group, the study region is more densely populated, and has proportionally more Black/African American residents.

- **Mortality Profile.** In 2013, the study region had 235 total deaths for residents age 0-21. The leading causes of death were related to prematurity and low birth weight; homicide; and motor vehicle traffic accidents. The study region death rates were higher than the statewide rates overall.

- **Maternal and Infant Health Profile.** In 2013, the study region had 16,956 total live births. Compared to Virginia as a whole, study region had a higher rate of non-marital births, and a lower rate of late prenatal care births. The teen pregnancy rate was higher than the statewide rate in five localities (cities of Colonial Heights, Fredericksburg, Hopewell, Petersburg and Richmond). The five-year infant mortality rate was higher than the statewide rate in four localities (Spotylvania County and the cities of Hopewell, Petersburg and Richmond).

- **Pediatric Quality Indicator Hospitalization Profile.** The Agency for Healthcare Research and Quality (AHRQ) defines a set of conditions (called Pediatric Quality Indicators, or ‘PDIs’) for which hospitalization for children age 0-17 should be avoidable with proper outpatient health care. High rates of hospitalization for these conditions indicate potential gaps in access to quality outpatient services for community residents. This study focused on five PDI conditions including Pediatric Asthma, Gastroenteritis, Diabetes, Urinary Tract Infection, and Perforated Appendix. Study region residents age 0-17 had 962 PDI discharges for these conditions in 2013. Hospitalization rates for PDI conditions were higher in the study region than for Virginia overall.

- **Behavioral Health Hospitalization Discharge Profile.** Behavioral health hospitalizations provide another important indicator of community health status. In 2013, study region residents age 0-21 had 3,348 hospital discharges from Virginia community hospitals for behavioral health conditions. The leading diagnoses for these hospitalizations were Affective Psychoses; Depressive Disorders-Not Elsewhere Classified; Adjustment Reaction; Schizophrenic Disorders; and Other Nonorganic Psychoses. Hospitalization rates for behavioral health conditions were higher in the study region than for Virginia overall.
• **Injury and Rehabilitation Hospitalization Discharge Profile.** Hospitalizations for injury and rehabilitation are of particular interest for studies of children’s health. This study analyzed hospitalizations for a list of eight diagnoses or procedures selected in consultation with Children’s Hospital of Richmond of the Virginia Commonwealth University Health System staff. In 2013, study region residents age 0-21 had 499 discharges for these diagnoses or procedures. The most common diagnoses/procedures were Physical Therapy, Respiratory Therapy and Rehabilitation and Other Related Procedures; Brain Injury; Care Involving Use of Rehabilitation Procedures; Traumatic Brain Injury; and Stroke. The hospitalization rates for these diagnoses/procedures combined were higher for the study region than for Virginia overall.

• **Youth Health Risk Profile.** The study includes a profile of selected health risks for youth age 10-19. The estimates indicate that substantial numbers of youth in the study region have health risks related to nutrition, body weight, physical activity, tobacco, alcohol and mental health.

• **Special Healthcare Needs Profile.** Special education programs provide specially designed instruction to meet the unique needs of children with disabilities, including instruction conducted in the school setting, in the home, in hospitals, in institutions, and in other settings. Data from the Virginia Department of Education for 2014-2015 indicate that local school divisions provide special education programs for thousands of children with a wide range of disabilities. See the full section for school-based data, and additional community data on the estimated prevalence of autism, developmental delays, and intellectual disability.

• **Uninsured Profile.** At a given point in time in 2014, an estimated 24,002 children age 0-18 in the study region were uninsured. An estimated 50% of the uninsured children had income at or below 200% of the federal poverty level (FPL).

• **Medically Underserved Profile.** Medically Underserved Areas (MUAs) and Medically Underserved Populations (MUPs) are designated by the U.S. Health Resources and Services Administration as being at risk for health care access problems. The designations are based on several factors including primary care provider supply, infant mortality, prevalence of poverty, and the prevalence of seniors age 65+. Nine of the 12 localities that include the study region have been fully or partially designated as MUAs/MUPs.

**Additional Resources**

*Appendix A* provides a set of thematically colored maps displaying variation in selected community health indicators by zip code. The underlying data for these maps are provided in a separate Microsoft Excel file. *Appendix B* provides a list of the data sources used in the analysis contained in this report.
Part I. Community Insight Profile

In an effort to generate community input for the study, two Community Insight Surveys were conducted; one with a group of community professionals, and one with a group of parents/caregivers of Children’s Hospital of Richmond of the Virginia Commonwealth University Health System patients. The purpose of the surveys was to identify support needs for area families that have children with health needs. The survey of community professionals was administered via an online survey tool, and the survey of parents/caregivers was administered during check-in/check-out at Children’s Hospital of Richmond of the Virginia Commonwealth University Health System facilities. The following sections present respondent profiles for each survey, and a summary of the survey results.

A. Respondent Profile for the Community Professional Survey

Twenty-four (24) community professionals completed the survey. Exhibit I-1 below presents a profile of the survey respondents.

Exhibit I-1
Profile of Respondents to the Community Professional Survey

<table>
<thead>
<tr>
<th>Survey Respondents by Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Note: A count is provided for organizations with multiple survey respondents.</td>
</tr>
<tr>
<td>• Care Connection for Children (5)</td>
</tr>
<tr>
<td>• Central VA Care Connection for Children</td>
</tr>
<tr>
<td>• Children’s Museum of Richmond</td>
</tr>
<tr>
<td>• CVS-Omnicare</td>
</tr>
<tr>
<td>• Department of Behavioral Health Early Intervention</td>
</tr>
<tr>
<td>• Family Lifeline</td>
</tr>
<tr>
<td>• Fredericksburg City Public Schools (2)</td>
</tr>
<tr>
<td>• Greater Richmond ARC</td>
</tr>
<tr>
<td>• Pediatrics VCU/Care Connection for Children</td>
</tr>
<tr>
<td>• Richmond City Health District</td>
</tr>
<tr>
<td>• Ronald McDonald House Charities of Richmond</td>
</tr>
<tr>
<td>• VCU School of Dentistry</td>
</tr>
<tr>
<td>• VCU/Partnership for People with Disabilities</td>
</tr>
<tr>
<td>• Virginia Treatment Center for Children</td>
</tr>
<tr>
<td>• Unknown Organization (5)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Survey Respondents by Local Perspective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Note: Respondents selected multiple localities; therefore, the percent total does not equal 100%, and the count total does not equal 24.</td>
</tr>
<tr>
<td>Locality</td>
</tr>
<tr>
<td>------------------------------</td>
</tr>
<tr>
<td>Richmond City</td>
</tr>
<tr>
<td>Hanover County</td>
</tr>
<tr>
<td>Petersburg City</td>
</tr>
<tr>
<td>Chesterfield County</td>
</tr>
<tr>
<td>Henrico County</td>
</tr>
<tr>
<td>Colonial Heights City</td>
</tr>
<tr>
<td>Hopewell City</td>
</tr>
<tr>
<td>King George County</td>
</tr>
<tr>
<td>Powhatan County</td>
</tr>
<tr>
<td>Fredericksburg City</td>
</tr>
<tr>
<td>Spotsylvania County</td>
</tr>
<tr>
<td>Stafford County</td>
</tr>
</tbody>
</table>
B. Respondent Profile for the Parent/Caregiver Survey

One hundred and fifty-two (152) parents/caregivers completed the survey. Survey respondents were asked to provide their zip code, household size, age range and annual household income as part of the survey. A demographic profile of the survey respondents is provided in Exhibit I-2.

Exhibit I-2
Profile of Respondents to the Parent/Caregiver Survey

<table>
<thead>
<tr>
<th>Age</th>
<th>Response Count</th>
<th>Response Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-24</td>
<td>11</td>
<td>8%</td>
</tr>
<tr>
<td>25-34</td>
<td>53</td>
<td>36%</td>
</tr>
<tr>
<td>35-44</td>
<td>56</td>
<td>38%</td>
</tr>
<tr>
<td>45-54</td>
<td>18</td>
<td>12%</td>
</tr>
<tr>
<td>55-64</td>
<td>8</td>
<td>6%</td>
</tr>
<tr>
<td>65+</td>
<td>0</td>
<td>0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Household Size</th>
<th>Response Count</th>
<th>Response Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>One Person (only me)</td>
<td>1</td>
<td>1%</td>
</tr>
<tr>
<td>Two People</td>
<td>13</td>
<td>9%</td>
</tr>
<tr>
<td>Three People</td>
<td>44</td>
<td>29%</td>
</tr>
<tr>
<td>Four People</td>
<td>48</td>
<td>32%</td>
</tr>
<tr>
<td>Five People</td>
<td>26</td>
<td>17%</td>
</tr>
<tr>
<td>More than 5 people</td>
<td>19</td>
<td>13%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Income</th>
<th>Response Count</th>
<th>Response Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than $25,000</td>
<td>44</td>
<td>30%</td>
</tr>
<tr>
<td>$25,000 - $34,999</td>
<td>24</td>
<td>16%</td>
</tr>
<tr>
<td>$35,000-$49,999</td>
<td>20</td>
<td>14%</td>
</tr>
<tr>
<td>$50,000-$74,999</td>
<td>13</td>
<td>9%</td>
</tr>
<tr>
<td>$75,000 or more</td>
<td>33</td>
<td>22%</td>
</tr>
<tr>
<td>Don't know or unsure</td>
<td>13</td>
<td>9%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Locality</th>
<th>Response Count</th>
<th>Response Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>152</td>
<td>100%</td>
</tr>
<tr>
<td>Chesterfield County</td>
<td>48</td>
<td>32%</td>
</tr>
<tr>
<td>Hanover County</td>
<td>23</td>
<td>15%</td>
</tr>
<tr>
<td>Henrico County</td>
<td>15</td>
<td>10%</td>
</tr>
<tr>
<td>Charles City County</td>
<td>12</td>
<td>8%</td>
</tr>
<tr>
<td>Caroline County</td>
<td>7</td>
<td>5%</td>
</tr>
<tr>
<td>Stafford County</td>
<td>7</td>
<td>5%</td>
</tr>
<tr>
<td>Culpeper County</td>
<td>6</td>
<td>4%</td>
</tr>
<tr>
<td>Brunswick County</td>
<td>5</td>
<td>3%</td>
</tr>
<tr>
<td>Amelia County</td>
<td>4</td>
<td>3%</td>
</tr>
<tr>
<td>Dinwiddie County</td>
<td>4</td>
<td>3%</td>
</tr>
<tr>
<td>Goochland County</td>
<td>4</td>
<td>3%</td>
</tr>
<tr>
<td>Fauquier County</td>
<td>3</td>
<td>2%</td>
</tr>
<tr>
<td>Richmond City</td>
<td>3</td>
<td>2%</td>
</tr>
<tr>
<td>Fairfax City</td>
<td>2</td>
<td>1%</td>
</tr>
<tr>
<td>Fredericksburg County</td>
<td>2</td>
<td>1%</td>
</tr>
<tr>
<td>Prince William County</td>
<td>2</td>
<td>1%</td>
</tr>
<tr>
<td>Buckingham County</td>
<td>1</td>
<td>1%</td>
</tr>
<tr>
<td>Charlotte County</td>
<td>1</td>
<td>1%</td>
</tr>
<tr>
<td>Lancaster County</td>
<td>1</td>
<td>1%</td>
</tr>
<tr>
<td>Louisa County</td>
<td>1</td>
<td>1%</td>
</tr>
<tr>
<td>Middlesex County</td>
<td>1</td>
<td>1%</td>
</tr>
</tbody>
</table>

Note: Respondents provided their zip code, which were then matched to a locality. It is important to note some zip code could be allocated to more than one locality, as zip code boundaries often cross city/county borders.
C. Summary of the Survey Results

Exhibit I-3 presents summary results from the survey of community professionals, and the survey of parents/caregivers. Both surveys asked respondents to identify family support needs from a pre-defined list, and respondents were also invited to identify additional needs at their option. The exhibit shows the number and percent of respondents to the community professional survey who reported serving ‘some’ or ‘many’ families needing each support shown. The exhibit also shows the number and percent of parents/caregivers who identified each support as a need for their family. Additional comments from survey respondents are shown in the continuation of the exhibit on the following page.

<table>
<thead>
<tr>
<th>Support for…</th>
<th>Identified as a Need in Community Professional Survey</th>
<th>Identified as a Need in Parent/Caregiver Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Learning about the child’s health and developmental needs</td>
<td>24 (100%)</td>
<td>35 (36%)</td>
</tr>
<tr>
<td>2. Learning specific skills to care for the child</td>
<td>22 (92%)</td>
<td>32 (33%)</td>
</tr>
<tr>
<td>3. Understanding health information and directions provided by the child’s service providers</td>
<td>22 (92%)</td>
<td>17 (17%)</td>
</tr>
<tr>
<td>4. Communicating with service providers to help them understand what the child really needs</td>
<td>20 (83%)</td>
<td>23 (23%)</td>
</tr>
<tr>
<td>5. Getting help around the house so they have time and energy to focus on the child’s needs</td>
<td>14 (58%)</td>
<td>32 (33%)</td>
</tr>
<tr>
<td>6. Getting emotional support when they start to feel overwhelmed</td>
<td>21 (88%)</td>
<td>35 (36%)</td>
</tr>
<tr>
<td>7. Getting help with making appointments for the child</td>
<td>17 (71%)</td>
<td>8 (8%)</td>
</tr>
<tr>
<td>8. Getting help with transportation to visits and appointments</td>
<td>20 (83%)</td>
<td>10 (10%)</td>
</tr>
<tr>
<td>9. Getting help with coordinating services for the child</td>
<td>20 (83%)</td>
<td>24 (24%)</td>
</tr>
<tr>
<td>10. Finding a good primary care provider for the child</td>
<td>17 (71%)</td>
<td>13 (13%)</td>
</tr>
<tr>
<td>11. Finding good medical specialists for the child</td>
<td>19 (80%)</td>
<td>29 (30%)</td>
</tr>
<tr>
<td>12. Finding a good dentist for the child</td>
<td>16 (67%)</td>
<td>15 (15%)</td>
</tr>
<tr>
<td>13. Finding a good counselor or mental health professional for the child</td>
<td>20 (83%)</td>
<td>21 (21%)</td>
</tr>
<tr>
<td>14. Getting the prescriptions and health supplies the child needs</td>
<td>19 (79%)</td>
<td>12 (12%)</td>
</tr>
<tr>
<td>15. Getting good outpatient hospital care for the child</td>
<td>15 (63%)</td>
<td>11 (11%)</td>
</tr>
<tr>
<td>16. Getting good inpatient hospital care for the child</td>
<td>12 (50%)</td>
<td>7 (7%)</td>
</tr>
<tr>
<td>17. Getting good home health services for the child</td>
<td>18 (75%)</td>
<td>13 (13%)</td>
</tr>
<tr>
<td>18. Getting respite care for me and others who care for the child</td>
<td>18 (75%)</td>
<td>23 (23%)</td>
</tr>
<tr>
<td>19. Finding adequate health coverage for the child</td>
<td>17 (71%)</td>
<td>13 (13%)</td>
</tr>
<tr>
<td>20. Finding a supportive child care environment for the child</td>
<td>19 (79%)</td>
<td>18 (18%)</td>
</tr>
<tr>
<td>21. Finding a supportive school environment for the child</td>
<td>18 (75%)</td>
<td>26 (27%)</td>
</tr>
<tr>
<td>22. Finding a supportive after school environment for the child</td>
<td>21 (88%)</td>
<td>22 (22%)</td>
</tr>
<tr>
<td>23. Finding a supportive work environment that will allow the parent/caregiver to care for the child</td>
<td>18 (75%)</td>
<td>25 (26%)</td>
</tr>
<tr>
<td>24. Finding other services and supports for the child</td>
<td>19 (79%)</td>
<td>20 (20%)</td>
</tr>
</tbody>
</table>

Continued
### Additional Comments from Community Professionals

- Affordable housing. Legal assistance for guardianship issues
- Finding care that is affordable. Social supports for families of children with disabilities, including siblings. Help with navigating the many siloed systems in our community. Help with the educational system, especially special education & obtaining medical services within schools. Post-secondary school opportunities, especially for people with disabilities. Transition services - both finding them as well as identifying adult providers to accept caring for young adults with any issues. Ending the Medicaid Waiver waitlist for families of children with disabilities as a means to fund these services. Finding behavioral health services. Finding services for children with multiple disabilities, especially those that include both "medical" and "behavioral" issues. Finding rural services.
- Nurturing parenting skills and 1:1 support for parents and Child-appropriate activities that are not high cost.
- Services specific to age - i.e., Transition aged youth or young child; also trauma based care

### Additional Comments from Parents/Caregivers

- A.B.A. coverage by private health insurance
- Autism therapy such as ABA, etc.
- Community activities where I don't have to stay with them to assist/support.
- Community recreational activities that are inclusive. Tutoring to enhance what he is learning at school
- Dr. Bortell is amazing.
- Drop in daycare/sick child daycare on Hull St./Woodlake side of Midlothian.
- Feeding and Behavioral
- Finding area programs for my child outside of the Children Hospital Community Programs
- Getting help in the school to help my child learn better and get extra help.
- I know I may need other services but do not have a clue what they may be
- Interpreter needed for communication and finding good resources near home (dermatologist)
- Lucille O'Neil is so very helpful with information when we need it. The hospital staff and inpatient and outpatient is very good. Thank you!
- Making connections with other parents dealing with the same issues
- Maybe support groups with people her age, especially regarding the lymphedema (age 18 on 7/4)
- Music therapy
- Outpatient therapy in the Hull Street/Brandermill/Woodlake area is needed.
- Providing more summer activities for children especially in rural areas.
- School understanding
- Summer activities and programs.
Part II. Community Indicator Profile

This section of the report provides a quantitative profile of the study region based on a wide array of community health indicators. To produce the profile, Community Health Solutions analyzed data from multiple sources. By design, the analysis does not include every possible indicator of community health. The analysis is focused on a set of indicators that provide broad insight into community health for children and families, and for which there were readily available data sources.

The results of this profile can be used to evaluate community health status compared to the Commonwealth of Virginia overall. The results can also be helpful for determining the number of people within the study region affected by specific health concerns. In addition, the results can be used alongside the Community Insight Survey results and the zip code level maps to help inform action plans for community health improvement. This section includes eleven profiles as follows:

1. Health Demographic Trend Profile
2. Health Demographic Snapshot
3. Mortality Profile
4. Maternal and Infant Health Profile
5. Pediatric Quality Indicators Hospitalization Profile
6. Behavioral Health Hospitalization Discharge Profile
7. Rehabilitation Hospitalization Profile
8. Youth Risk Factor Profile
9. Special Health Care Needs Profile
10. Uninsured Profile
11. Medically Underserved Profile
1. Health Demographic Trend Profile

Trends in health-related demographics are instructive for anticipating changes in community health status. Changes in the size of the population, age of the population, and racial/ethnic mix of the population can have a significant impact on overall health status, health needs and demand for local services.

As shown in Exhibit II-1, as of 2014, the study region included an estimated 1,398,622 people, 412,473 of whom were age 0-21. The population age 0-21 is expected to grow by 2% from 2014 to 2019. Focusing on sub-populations, all age groups are expected to grow or remain relatively stable with the exception of the 18-21 population which is expected to decline by 4%. The Asian and Black/African American populations are projected to remain relatively stable from 2014 to 2019; whereas, the White and Hispanic Ethnicity population are projected to increase.

Exhibit II-1
Health Demographic Trend, 2014-2019

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Population</td>
<td>1,338,945</td>
<td>1,398,622</td>
<td>1,482,206</td>
<td>6%</td>
</tr>
<tr>
<td>Total Population Age 0-21</td>
<td>403,676</td>
<td>412,473</td>
<td>420,751</td>
<td>2%</td>
</tr>
<tr>
<td>Population Density (per Sq. Mile)</td>
<td>588.8</td>
<td>610.5</td>
<td>646.9</td>
<td>6%</td>
</tr>
<tr>
<td><strong>By Age Group</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children Age 0-2 #</td>
<td>51,013</td>
<td>52,272</td>
<td>56,342</td>
<td>8%</td>
</tr>
<tr>
<td>Children Age 3-5 #</td>
<td>52,860</td>
<td>53,963</td>
<td>55,982</td>
<td>4%</td>
</tr>
<tr>
<td>Children Age 6-11 #</td>
<td>109,461</td>
<td>111,847</td>
<td>114,478</td>
<td>2%</td>
</tr>
<tr>
<td>Children Age 12-14 #</td>
<td>55,639</td>
<td>57,423</td>
<td>59,143</td>
<td>3%</td>
</tr>
<tr>
<td>Children Age 15-17 #</td>
<td>59,696</td>
<td>59,508</td>
<td>60,101</td>
<td>1%</td>
</tr>
<tr>
<td>Adults Age 18-21 #</td>
<td>75,007</td>
<td>77,460</td>
<td>74,705</td>
<td>-4%</td>
</tr>
<tr>
<td><strong>By Race/Ethnicity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>13,728</td>
<td>17,330</td>
<td>17,310</td>
<td>0%</td>
</tr>
<tr>
<td>Black/African American</td>
<td>124,803</td>
<td>129,584</td>
<td>127,805</td>
<td>-1%</td>
</tr>
<tr>
<td>White</td>
<td>228,069</td>
<td>215,982</td>
<td>226,796</td>
<td>5%</td>
</tr>
<tr>
<td>Hispanic Ethnicity</td>
<td>34,179</td>
<td>40,246</td>
<td>43,243</td>
<td>7%</td>
</tr>
</tbody>
</table>

*Note: Hispanic is a classification of ethnicity; therefore, Hispanic individuals are also included in the race categories. Estimates for Other/Multi/Unknown Race excluded from this analysis.*

*Source: Community Health Solutions analysis of estimates from Alteryx, Inc. See Appendix B. Data Sources for details.*
## 2. Health Demographic Snapshot

Community health is driven in large part by community demographics. The age, sex, race, ethnicity, and income status of a population are strong predictors of community health status and community health needs. Exhibit II-2 presents a snapshot of key health-related demographics of the study region.

As of 2014, the study region included an estimated 412,473 people age 0-21. Compared Virginia as a whole, the study region is more densely populated, and has proportionally more Black/African American residents. *Note: Maps 1-6 in Appendix A show the geographic distribution of the population by zip code.*

### Exhibit II-2

Health Demographic Snapshot, 2014

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Virginia</th>
<th>Study Region</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Counts</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population Age 0-21</td>
<td>2,361,414</td>
<td>412,473</td>
</tr>
<tr>
<td>Children Age 0-2</td>
<td>309,132</td>
<td>52,272</td>
</tr>
<tr>
<td>Children Age 3-5</td>
<td>314,688</td>
<td>53,963</td>
</tr>
<tr>
<td>Children Age 6-11</td>
<td>629,843</td>
<td>111,847</td>
</tr>
<tr>
<td>Children Age 12-14</td>
<td>313,388</td>
<td>57,423</td>
</tr>
<tr>
<td>Children Age 15-17</td>
<td>322,283</td>
<td>59,508</td>
</tr>
<tr>
<td>Adults Age 18-21</td>
<td>472,092</td>
<td>77,460</td>
</tr>
<tr>
<td>Female Population Age 0-21</td>
<td>1,155,897</td>
<td>203,247</td>
</tr>
<tr>
<td>Males Population Age 0-21</td>
<td>1,205,517</td>
<td>209,225</td>
</tr>
<tr>
<td>Asian Population Age 0-21</td>
<td>153,902</td>
<td>17,330</td>
</tr>
<tr>
<td>Black/African American Population Age 0-21</td>
<td>518,280</td>
<td>129,584</td>
</tr>
<tr>
<td>White Population Age 0-21</td>
<td>1,447,657</td>
<td>215,982</td>
</tr>
<tr>
<td>Hispanic Ethnicity Population Age 0-21</td>
<td>273,587</td>
<td>40,246</td>
</tr>
<tr>
<td>Low Income Family Households (Households with Income &lt; $35,000)</td>
<td>594,201</td>
<td>95,280</td>
</tr>
<tr>
<td><strong>Rates</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population Density (pop. per sq. mile)</td>
<td>206.1</td>
<td>610.5</td>
</tr>
<tr>
<td>Children Age 0-2 pct. of Total Pop. Age 0-21</td>
<td>13%</td>
<td>13%</td>
</tr>
<tr>
<td>Children Age 3-5 pct. of Total Pop. Age 0-21</td>
<td>13%</td>
<td>13%</td>
</tr>
<tr>
<td>Children Age 6-11 pct. of Total Pop. Age 0-21</td>
<td>27%</td>
<td>27%</td>
</tr>
<tr>
<td>Children Age 12-14 pct. of Total Pop. Age 0-21</td>
<td>13%</td>
<td>14%</td>
</tr>
<tr>
<td>Children Age 15-17 pct. of Total Pop. Age 0-21</td>
<td>14%</td>
<td>14%</td>
</tr>
<tr>
<td>Adults Age 18-21 pct. of Total Pop. Age 0-21</td>
<td>20%</td>
<td>19%</td>
</tr>
<tr>
<td>Female Pop. Age 0-21 pct. of Total Pop. Age 0-21</td>
<td>49%</td>
<td>49%</td>
</tr>
<tr>
<td>Male Pop. Age 0-21 pct. of Total Pop. Age 0-21</td>
<td>51%</td>
<td>51%</td>
</tr>
<tr>
<td>Asian Pop. Age 0-21 pct. of Total Pop. Age 0-21</td>
<td>7%</td>
<td>4%</td>
</tr>
<tr>
<td>Black/African American Pop. Age 0-21 pct. of Total Pop. Age 0-21</td>
<td>22%</td>
<td>31%</td>
</tr>
<tr>
<td>White Pop. Age 0-21 pct. of Total Pop. Age 0-21</td>
<td>61%</td>
<td>52%</td>
</tr>
<tr>
<td>Hispanic Ethnicity Pop. Age 0-21 pct. of Total Pop. Age 0-21</td>
<td>12%</td>
<td>10%</td>
</tr>
<tr>
<td>Low Income Family Households (Family Households with Income &lt; $35,000) pct. of Total Family Households</td>
<td>19%</td>
<td>18%</td>
</tr>
</tbody>
</table>

*Note: Hispanic is a classification of ethnicity; therefore, Hispanic individuals are also included in the race categories. Estimates for Other/Multi/Unknown Race excluded from this analysis.*

*Source: Community Health Solutions analysis of estimates from Alteryx, Inc. See Appendix B. Data Sources for details.*
3. Mortality Profile

As shown in Exhibit II-3, in 2013 the study region had 235 total deaths in the 0-21 age group. The leading causes of death were related to prematurity and low birth weight (28); homicide (12); and motor vehicle traffic accidents (10). The study region death rates were higher than the statewide rates overall. Note: Maps 7-10 in Appendix A show the geographic distribution of deaths by zip code.

### Exhibit II-3
Mortality Profile (Age 0-21), 2013

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Virginia</th>
<th>Study Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Deaths by Age 0-21</td>
<td>1,208</td>
<td>235</td>
</tr>
</tbody>
</table>

#### Counts by Age Group

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Virginia</th>
<th>Study Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age 0-2</td>
<td>689</td>
<td>118</td>
</tr>
<tr>
<td>Age 3-5</td>
<td>31</td>
<td>5</td>
</tr>
<tr>
<td>Age 6-11</td>
<td>68</td>
<td>13</td>
</tr>
<tr>
<td>Age 12-14</td>
<td>45</td>
<td>12</td>
</tr>
<tr>
<td>Age 15-17</td>
<td>94</td>
<td>19</td>
</tr>
<tr>
<td>Age 18-21</td>
<td>281</td>
<td>68</td>
</tr>
</tbody>
</table>

#### Counts by 10 Leading Causes

<table>
<thead>
<tr>
<th>Cause</th>
<th>Virginia</th>
<th>Study Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disorders Related to Short Gestation (Prematurity) and Low Birth Weight, Not Elsewhere Classified Deaths (Infant)</td>
<td>131</td>
<td>28</td>
</tr>
<tr>
<td>Homicide Deaths</td>
<td>42</td>
<td>12</td>
</tr>
<tr>
<td>Motor Vehicle Traffic Accidents Deaths</td>
<td>60</td>
<td>10</td>
</tr>
<tr>
<td>Sudden Infant Death Syndrome</td>
<td>49</td>
<td>9</td>
</tr>
<tr>
<td>Suffocation Deaths</td>
<td>29</td>
<td>7</td>
</tr>
<tr>
<td>Other Ill-Defined and Unknown Causes of Mortality (Infant)</td>
<td>33</td>
<td>5</td>
</tr>
<tr>
<td>Congenital Malformations, Deformations and Chromosomal Abnormalities Deaths (Perinatal)</td>
<td>19</td>
<td>4</td>
</tr>
<tr>
<td>Edward’s Syndrome Deaths (Infant)</td>
<td>16</td>
<td>3</td>
</tr>
<tr>
<td>Fetus Affected by Maternal Complications of Pregnancy Deaths (Perinatal)</td>
<td>24</td>
<td>3</td>
</tr>
<tr>
<td>Unintentional Injury Deaths</td>
<td>14</td>
<td>2</td>
</tr>
</tbody>
</table>

#### Rates per 100,000 by Age Group

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Virginia</th>
<th>Study Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Population Age 0-21</td>
<td>51.2</td>
<td>66.6</td>
</tr>
<tr>
<td>Age 0-2</td>
<td>222.9</td>
<td>270.5</td>
</tr>
<tr>
<td>Age 3-5</td>
<td>9.9</td>
<td>--</td>
</tr>
<tr>
<td>Age 6-11</td>
<td>10.8</td>
<td>--</td>
</tr>
<tr>
<td>Age 12-14</td>
<td>14.4</td>
<td>--</td>
</tr>
<tr>
<td>Age 15-17</td>
<td>29.2</td>
<td>--</td>
</tr>
<tr>
<td>Age 18-21</td>
<td>59.5</td>
<td>87.8</td>
</tr>
</tbody>
</table>

Note: -- Rates are not calculated where n<30. Motor vehicle traffic accident deaths for residents of the study region, not motor vehicle accident deaths occurring in the study region. Age adjusted death rates were not calculated for this study because the study region is defined by zip codes, and available data are not structured to support calculation of age adjusted death rates at the zip code level. Age group death rates are used as an alternative.

Source: Community Health Solutions analysis of mortality data from the Virginia Department of Health. See Appendix B. Data Sources for details.
4. Maternal and Infant Health Profile

As shown in Exhibit II-4A, the study region had 16,956 total live births in 2013. Compared to Virginia as a whole, the study region had a higher rate of non-marital births, and a lower rate of late prenatal care births. Note: Maps 11-14 in Appendix A show the geographic distribution of births by zip code.

Focusing on teen pregnancy and infant mortality, counts and rates for these indicators are shown at the locality level in Exhibit II-4B on the following page. Locality data are used for this analysis because available data are not sufficient to support analysis of rates for these indicators based on zip code boundaries. The teen pregnancy rate was higher than the statewide rate in five localities (cities of Colonial Heights, Fredericksburg, Hopewell, Petersburg and Richmond). The five-year infant mortality rate was higher than the statewide rate in four localities (Spotsylvania County; and the cities of Hopewell, Petersburg and Richmond).

Exhibit II-4A
Maternal and Infant Health Profile, 2013

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Virginia</th>
<th>Study Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Live Births</td>
<td>101,977</td>
<td>16,956</td>
</tr>
<tr>
<td>Low Weight Births (under 2,500 grams / 5 lb. 8 oz.)</td>
<td>8,178</td>
<td>1,466</td>
</tr>
<tr>
<td>Births Without Early Prenatal Care (No Prenatal Care in First 13 Weeks)</td>
<td>13,435</td>
<td>1,519</td>
</tr>
<tr>
<td>Non-Marital Births</td>
<td>35,289</td>
<td>6,993</td>
</tr>
<tr>
<td>Live Births to Teens Age 10-19</td>
<td>5,316</td>
<td>970</td>
</tr>
<tr>
<td></td>
<td>Live Births to Teens Age 18-19</td>
<td>4,073</td>
</tr>
<tr>
<td></td>
<td>Live Births to Teens Age 15-17</td>
<td>1,208</td>
</tr>
<tr>
<td></td>
<td>Live Births to Teens Age &lt;15</td>
<td>35</td>
</tr>
<tr>
<td>Rates</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Live Births Rate per 1,000 Population</td>
<td>12.3</td>
<td>12.2</td>
</tr>
<tr>
<td>Low Weight Births pct. of Total Live Births</td>
<td>8%</td>
<td>9%</td>
</tr>
<tr>
<td>Births Without Early Prenatal Care (No Prenatal Care in First 13 Weeks) pct. of Total Live Births</td>
<td>13%</td>
<td>9%</td>
</tr>
<tr>
<td>Non-Marital Births pct. of Total Live Births</td>
<td>35%</td>
<td>41%</td>
</tr>
<tr>
<td>Live Births to Teens Age 10-19</td>
<td>10.3</td>
<td>10.2</td>
</tr>
<tr>
<td></td>
<td>Live Births to Teens Age 18-19</td>
<td>36.4</td>
</tr>
<tr>
<td></td>
<td>Live Births to Teens Age 15-17</td>
<td>8.0</td>
</tr>
<tr>
<td></td>
<td>Live Births to Teens Age &lt;15</td>
<td>0.1</td>
</tr>
</tbody>
</table>

Source: Community Health Solutions analysis of maternal and infant health data from the Virginia Department of Health. See Appendix B. Data Sources for details.
## Exhibit II-4B
Teen Pregnancy and Infant Mortality, 2013

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Virginia</th>
<th>Chesterfield County</th>
<th>Colonial Heights City</th>
<th>Fredericksburg City</th>
<th>Hanover County</th>
<th>Henrico County</th>
<th>Hopewell City</th>
<th>King George County</th>
<th>Petersburg City</th>
<th>Powhatan County</th>
<th>Richmond City</th>
<th>Spotsylvania County</th>
<th>Stafford County</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Teen Pregnancy Counts and Rates</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Teenage Pregnancies Age 10-19 (2013)</td>
<td>7,447</td>
<td>243</td>
<td>26</td>
<td>64</td>
<td>76</td>
<td>222</td>
<td>54</td>
<td>20</td>
<td>117</td>
<td>16</td>
<td>489</td>
<td>105</td>
<td>87</td>
</tr>
<tr>
<td>Total Pregnancies per 1,000 Female Population Age 10-19 (2013)</td>
<td>14.4</td>
<td>10.1</td>
<td>22.4</td>
<td>29.0</td>
<td>10.4</td>
<td>11.2</td>
<td>41.1</td>
<td>11.7</td>
<td>73.8</td>
<td>9.9</td>
<td>41.3</td>
<td>11.1</td>
<td>7.9</td>
</tr>
<tr>
<td><strong>Infant Mortality Counts and Rates</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Infant Deaths (2013)</td>
<td>632</td>
<td>122</td>
<td>5</td>
<td>11</td>
<td>17</td>
<td>118</td>
<td>22</td>
<td>5</td>
<td>36</td>
<td>7</td>
<td>164</td>
<td>65</td>
<td>51</td>
</tr>
<tr>
<td>Five-Year Infant Mortality Rate per 1,000 Live Births (2013)</td>
<td>6.6</td>
<td>6.6</td>
<td>3.8</td>
<td>5.4</td>
<td>3.8</td>
<td>6.0</td>
<td>11.7</td>
<td>3.3</td>
<td>10.7</td>
<td>6.0</td>
<td>11.0</td>
<td>8.4</td>
<td>6.1</td>
</tr>
</tbody>
</table>

*Note: Indicators are shown at the city and county level because data are not available at the zip code level.*

*Source: Community Health Solutions analysis of maternal and infant health data from the Virginia Department of Health. See Appendix B. Data Sources for details.*
5. Pediatric Quality Indicator Hospitalization Profile

The Agency for Healthcare Research and Quality (AHRQ) defines a set of conditions (called Pediatric Quality Indicators, or ‘PDIs’) for which hospitalization for children age 0-17 should be avoidable with proper outpatient health care. High rates of hospitalization for these conditions indicate potential gaps in access to quality outpatient services for community residents. This study focused on five PDI conditions including Pediatric Asthma, Gastroenteritis, Diabetes, Urinary Tract Infection, and Perforated Appendix. As shown in Exhibit II-5, study region residents age 0-17 had 962 PDI discharges for these conditions in 2013, with Pediatric Asthma (542), Gastroenteritis (191), and Diabetes (93) as the most common diagnoses. Hospitalization rates for PDI conditions were higher in the study region than for Virginia overall. Note: Map 15 in Appendix A shows the geographic distribution of PDI discharges by zip code.

Exhibit II-5
Selected Pediatric Quality Indicator Hospitalizations (Age 0-17), 2013

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Virginia</th>
<th>Study Region</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Counts- Age Group</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age 0-17</td>
<td>2,831</td>
<td>962</td>
</tr>
<tr>
<td>Age 0-2</td>
<td>632</td>
<td>211</td>
</tr>
<tr>
<td>Age 3-5</td>
<td>679</td>
<td>240</td>
</tr>
<tr>
<td>Age 6-11</td>
<td>899</td>
<td>304</td>
</tr>
<tr>
<td>Age 12-14</td>
<td>312</td>
<td>119</td>
</tr>
<tr>
<td>Age 15-17</td>
<td>309</td>
<td>88</td>
</tr>
<tr>
<td><strong>Counts-Diagnosis</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pediatric Asthma Discharges</td>
<td>1,286</td>
<td>542</td>
</tr>
<tr>
<td>Gastroenteritis Discharges</td>
<td>636</td>
<td>191</td>
</tr>
<tr>
<td>Diabetes Discharges</td>
<td>269</td>
<td>93</td>
</tr>
<tr>
<td>Urinary Tract Infection Discharges</td>
<td>350</td>
<td>89</td>
</tr>
<tr>
<td>Perforated Appendix Discharges</td>
<td>290</td>
<td>47</td>
</tr>
<tr>
<td><strong>Rates per 100,000- Age Group</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Population Age 0-17</td>
<td>149.8</td>
<td>408.4</td>
</tr>
<tr>
<td>Age 0-2</td>
<td>204.4</td>
<td>575.6</td>
</tr>
<tr>
<td>Age 3-5</td>
<td>215.8</td>
<td>633.0</td>
</tr>
<tr>
<td>Age 6-11</td>
<td>142.7</td>
<td>385.7</td>
</tr>
<tr>
<td>Age 12-14</td>
<td>99.6</td>
<td>294.4</td>
</tr>
<tr>
<td>Age 15-17</td>
<td>95.9</td>
<td>210.9</td>
</tr>
</tbody>
</table>

Note: -- Rates are not calculated where n<30. Age adjusted rates were not calculated for this study because the study region is defined by zip codes, and available data are not structured to support calculation of age adjusted rates at the zip code level. Age group rates are used as an alternative. See Appendix B for details.

Source: Community Health Solutions analysis of hospital discharge data from Virginia Health Information, Inc. and local demographic estimates from Alteryx, Inc. See Appendix B. Data Sources for details.
Behavioral health hospitalizations provide another important indicator of community health status. As shown in Exhibit II-6, in 2013 study region residents age 0-21 had 3,348 hospital discharges for behavioral health conditions. The leading diagnoses for these hospitalizations were Affective Psychoses (1,816); Depressive Disorders-Not Elsewhere Classified (582); Adjustment Reaction (214); Schizophrenic Disorders (164); and Other Nonorganic Psychoses (161). Hospitalization rates for behavioral health conditions were higher in the study region than for Virginia overall. Note: Map 16 in Appendix A shows the geographic distribution of behavioral health hospitalization discharges by zip code.

### Exhibit II-6
Behavioral Health Hospitalization Discharges (Age 0-21), 2013

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Virginia</th>
<th>Study Region</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Counts by Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age 0-21</td>
<td>11,239</td>
<td>3,348</td>
</tr>
<tr>
<td>Age 0-2</td>
<td>26</td>
<td>5</td>
</tr>
<tr>
<td>Age 3-5</td>
<td>53</td>
<td>18</td>
</tr>
<tr>
<td>Age 6-11</td>
<td>985</td>
<td>353</td>
</tr>
<tr>
<td>Age 12-14</td>
<td>2,237</td>
<td>705</td>
</tr>
<tr>
<td>Age 15-17</td>
<td>3,450</td>
<td>1,068</td>
</tr>
<tr>
<td>Age 18-21</td>
<td>4,488</td>
<td>1,199</td>
</tr>
<tr>
<td><strong>Counts by Leading Diagnoses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affective Psychoses</td>
<td>7,014</td>
<td>1,816</td>
</tr>
<tr>
<td>Depressive Disorder, Not Elsewhere Classified</td>
<td>1,233</td>
<td>582</td>
</tr>
<tr>
<td>Adjustment Reaction</td>
<td>601</td>
<td>214</td>
</tr>
<tr>
<td>Schizophrenic Disorders</td>
<td>563</td>
<td>164</td>
</tr>
<tr>
<td>Other Nonorganic Psychoses</td>
<td>462</td>
<td>161</td>
</tr>
<tr>
<td>Neurotic Disorders</td>
<td>309</td>
<td>123</td>
</tr>
<tr>
<td>Neurotic Syndrome of Childhood</td>
<td>138</td>
<td>86</td>
</tr>
<tr>
<td>Drug Psychoses</td>
<td>225</td>
<td>37</td>
</tr>
<tr>
<td>Drug Dependence</td>
<td>97</td>
<td>24</td>
</tr>
<tr>
<td>Special Symptoms or Syndromes Not Elsewhere Classified</td>
<td>84</td>
<td>13</td>
</tr>
<tr>
<td><strong>Rates per 100,000</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age 0-21</td>
<td>475.9</td>
<td>949.3</td>
</tr>
<tr>
<td>Age 0-2</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Age 3-5</td>
<td>16.8</td>
<td>--</td>
</tr>
<tr>
<td>Age 6-11</td>
<td>156.4</td>
<td>383.5</td>
</tr>
<tr>
<td>Age 12-14</td>
<td>713.8</td>
<td>1,506.9</td>
</tr>
<tr>
<td>Age 15-17</td>
<td>1,070.5</td>
<td>2,223.9</td>
</tr>
<tr>
<td>Age 18-21</td>
<td>950.2</td>
<td>1,547.9</td>
</tr>
</tbody>
</table>

Note: -- Rates are not calculated where n<30.

Source: Community Health Solutions analysis of hospital discharge data from Virginia Health Information and demographic data from Alteryx, Inc. See details on methods in Appendix B.
Hospitalizations for injury and rehabilitation are of particular interest for studies of children’s health. This study analyzed hospitalizations for a list of eight diagnoses or procedures selected in consultation with Children’s Hospital of Richmond of the Virginia Commonwealth University Health System staff. As shown in Exhibit II-7, in 2013 study region residents age 0-21 had 499 discharges for these diagnoses or procedures. The most common diagnoses/procedures were Physical Therapy, Respiratory Therapy and Rehabilitation and Other Related Procedures (305); Brain Injury (83); Care Involving Use of Rehabilitation Procedures (50); Traumatic Brain Injury (25) and Stroke (19). The hospitalization rates for these diagnoses/procedures combined were higher for the study region than for Virginia overall.

### Exhibit II-7
Selected Injury and Rehabilitation Hospitalization Discharges (Age 0-21), 2013

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Virginia</th>
<th>Study Region</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Counts by Age Group</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age 0-21</td>
<td>2,885</td>
<td>499</td>
</tr>
<tr>
<td>Age 0-2</td>
<td>1,717</td>
<td>298</td>
</tr>
<tr>
<td>Age 3-5</td>
<td>145</td>
<td>18</td>
</tr>
<tr>
<td>Age 6-11</td>
<td>176</td>
<td>28</td>
</tr>
<tr>
<td>Age 12-14</td>
<td>126</td>
<td>26</td>
</tr>
<tr>
<td>Age 15-17</td>
<td>216</td>
<td>37</td>
</tr>
<tr>
<td>Age 18-21</td>
<td>505</td>
<td>92</td>
</tr>
<tr>
<td><strong>Counts by Selected Injury and Rehabilitation Diagnoses or Procedures</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical therapy, respiratory therapy and rehabilitation, and related procedures</td>
<td>1,889</td>
<td>305</td>
</tr>
<tr>
<td>Brain Injury</td>
<td>470</td>
<td>83</td>
</tr>
<tr>
<td>Care involving use of rehabilitation procedures</td>
<td>242</td>
<td>50</td>
</tr>
<tr>
<td>Traumatic Brain Injury</td>
<td>99</td>
<td>25</td>
</tr>
<tr>
<td>Stroke</td>
<td>92</td>
<td>19</td>
</tr>
<tr>
<td>Amputations</td>
<td>38</td>
<td>7</td>
</tr>
<tr>
<td>Multiple Sclerosis</td>
<td>19</td>
<td>4</td>
</tr>
<tr>
<td>Wrist/Hand Fractures</td>
<td>26</td>
<td>3</td>
</tr>
<tr>
<td><strong>Rates per 100,000</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age 0-21</td>
<td>122.2</td>
<td>141.5</td>
</tr>
<tr>
<td>Age 0-2</td>
<td>555.4</td>
<td>683.2</td>
</tr>
<tr>
<td>Age 3-5</td>
<td>46.1</td>
<td>--</td>
</tr>
<tr>
<td>Age 6-11</td>
<td>27.9</td>
<td>--</td>
</tr>
<tr>
<td>Age 12-14</td>
<td>40.2</td>
<td>--</td>
</tr>
<tr>
<td>Age 15-17</td>
<td>67.0</td>
<td>77.0</td>
</tr>
<tr>
<td>Age 18-21</td>
<td>106.9</td>
<td>118.8</td>
</tr>
</tbody>
</table>

*Note:* Rates are not calculated where n<30. Children’s Hospital of Richmond of the Virginia Commonwealth University Health System selected this set of injury and rehabilitation discharges for analysis. The total of all ages does not add up to the sum of the age groups because an age was not reported for some discharges.

*Source:* Community Health Solutions analysis of hospital discharge data from Virginia Health Information and demographic data from Alteryx, Inc. See details on methods in Appendix B.
This section examines selected health risks for youth age 10-19. These risks have received increasing attention as the population of American children has become more sedentary, more prone to unhealthy eating and more likely to develop unhealthy body weight. The long-term implications of these trends are serious, as these factors place children at higher risk for chronic disease both now and in adulthood.

Exhibit II-8 shows estimates indicating that substantial numbers of youth in the study region have health risks related to nutrition, body weight, physical activity, tobacco, alcohol, and mental health. Note: Map 17 in Appendix A shows the geographic distribution of youth overweight or obese by zip code.

### Exhibit II-8
Youth Health Risk Factor Profile (2014 Estimates)

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Study Region</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Counts (Estimates)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>High School Youth Age 14-19</strong></td>
<td></td>
</tr>
<tr>
<td>Total Estimated High School Youth Age 14-19</td>
<td>117,399</td>
</tr>
<tr>
<td>Met Guidelines for Fruit and Vegetable Intake</td>
<td>9,668</td>
</tr>
<tr>
<td>Overweight or Obese</td>
<td>32,824</td>
</tr>
<tr>
<td>Not Meeting Recommendations for Physical Activity in the Past Week</td>
<td>65,227</td>
</tr>
<tr>
<td>Used Tobacco in the Past 30 Days</td>
<td>21,310</td>
</tr>
<tr>
<td>Had at least One Drink of Alcohol At least One Day in the Past 30 Days</td>
<td>31,922</td>
</tr>
<tr>
<td>Felt Sad or Hopeless (almost every day for two or more weeks in a row so that they stopped doing some usual activities)</td>
<td>29,194</td>
</tr>
<tr>
<td><strong>Middle School Youth Age 10-14</strong></td>
<td></td>
</tr>
<tr>
<td>Total Estimated Middle School Youth Age 10-14</td>
<td>46,463</td>
</tr>
<tr>
<td>Met Guidelines for Fruit and Vegetable Intake</td>
<td>11,234</td>
</tr>
<tr>
<td>Did Not Meet Recommendations for Physical Activity in the Past Week</td>
<td>30,596</td>
</tr>
<tr>
<td>Used Tobacco in the Past 30 Days</td>
<td>1,094</td>
</tr>
<tr>
<td><strong>Rates (Percent Estimates)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>High School Youth Age 14-19</strong></td>
<td></td>
</tr>
<tr>
<td>Met Guidelines for Fruit and Vegetable Intake</td>
<td>8%</td>
</tr>
<tr>
<td>Overweight or Obese</td>
<td>28%</td>
</tr>
<tr>
<td>Not Meeting Recommendations for Physical Activity in the Past Week</td>
<td>56%</td>
</tr>
<tr>
<td>Used Tobacco in the Past 30 Days</td>
<td>18%</td>
</tr>
<tr>
<td>Had at least One Drink of Alcohol At least One Day in the Past 30 Days</td>
<td>27%</td>
</tr>
<tr>
<td>Felt Sad or Hopeless (almost every day for two or more weeks in a row so that they stopped doing some usual activities)</td>
<td>25%</td>
</tr>
<tr>
<td><strong>Middle School Youth Age 10-14</strong></td>
<td></td>
</tr>
<tr>
<td>Met Guidelines for Fruit and Vegetable Intake</td>
<td>24%</td>
</tr>
<tr>
<td>Did Not Meet Guidelines Recommendations for Physical Activity in the Past Week</td>
<td>66%</td>
</tr>
<tr>
<td>Used Tobacco in the Past 30 Days</td>
<td>2%</td>
</tr>
</tbody>
</table>

*Note: Please note that all indicators in this profile are estimates, and therefore subject to estimation error.*

*Source: Estimates produced by Community Health Solutions using Youth Risk Behavioral Surveillance System data and local demographic estimates from Alteryx, Inc. See Appendix B. Data Sources for details.*
9. Special Health Care Needs Profile

According to the Virginia Department of Education, “special education means specially designed instruction, at no cost to the parent(s), to meet the unique needs of a child with a disability, including instruction conducted in a classroom, in the home, in hospitals, in institutions, and in other settings and instruction in physical education.” As shown in Exhibit II-9A, data from the Virginia Department of Education for 2014-2015 indicate that local school divisions provide special education programs for thousands of children with a wide range of disabilities.

Exhibit II-9A
Special Education Enrollment (Age 0-22), 2014-2015

<table>
<thead>
<tr>
<th>Indicators</th>
<th>VA</th>
<th>Chesterfield County</th>
<th>Colonial Heights City of</th>
<th>Fredericksburg City of</th>
<th>Hanover County</th>
<th>Henrico County</th>
<th>Hopewell City of</th>
<th>King George County</th>
<th>Petersburg City of</th>
<th>Powhatan County</th>
<th>Richmond City of</th>
<th>Spotsylvania County</th>
<th>Stafford County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Children in Special Education, by Disability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autism</td>
<td>17,030</td>
<td>792</td>
<td>30</td>
<td>21</td>
<td>302</td>
<td>654</td>
<td>42</td>
<td>37</td>
<td>48</td>
<td>57</td>
<td>281</td>
<td>293</td>
<td>361</td>
</tr>
<tr>
<td>Deaf Blindness</td>
<td>32</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>--</td>
<td>0</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0</td>
<td>--</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Developmental Delay</td>
<td>11,155</td>
<td>305</td>
<td>26</td>
<td>33</td>
<td>62</td>
<td>408</td>
<td>17</td>
<td>52</td>
<td>19</td>
<td>20</td>
<td>294</td>
<td>203</td>
<td>118</td>
</tr>
<tr>
<td>Emotional Disturbance</td>
<td>9,209</td>
<td>394</td>
<td>32</td>
<td>29</td>
<td>155</td>
<td>358</td>
<td>35</td>
<td>22</td>
<td>23</td>
<td>32</td>
<td>227</td>
<td>161</td>
<td>147</td>
</tr>
<tr>
<td>Hearing Impairments</td>
<td>1,475</td>
<td>33</td>
<td>--</td>
<td>--</td>
<td>17</td>
<td>52</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>33</td>
<td>21</td>
<td>51</td>
</tr>
<tr>
<td>Intellectual Disabilities</td>
<td>9,079</td>
<td>469</td>
<td>23</td>
<td>17</td>
<td>66</td>
<td>332</td>
<td>91</td>
<td>31</td>
<td>81</td>
<td>10</td>
<td>325</td>
<td>138</td>
<td>164</td>
</tr>
<tr>
<td>Multiple Disabilities</td>
<td>3,356</td>
<td>63</td>
<td>--</td>
<td>--</td>
<td>31</td>
<td>109</td>
<td>11</td>
<td>12</td>
<td>21</td>
<td>--</td>
<td>176</td>
<td>32</td>
<td>46</td>
</tr>
<tr>
<td>Other Health Impairments</td>
<td>31,546</td>
<td>1,574</td>
<td>92</td>
<td>82</td>
<td>681</td>
<td>1,613</td>
<td>103</td>
<td>67</td>
<td>135</td>
<td>143</td>
<td>999</td>
<td>499</td>
<td>501</td>
</tr>
<tr>
<td>Orthopedic Impairments</td>
<td>771</td>
<td>19</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>18</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>18</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Specific Learning Disability</td>
<td>53,534</td>
<td>2,156</td>
<td>169</td>
<td>94</td>
<td>725</td>
<td>1,781</td>
<td>141</td>
<td>138</td>
<td>116</td>
<td>128</td>
<td>1,375</td>
<td>832</td>
<td>781</td>
</tr>
<tr>
<td>Speech or Language Impairments</td>
<td>24,735</td>
<td>1,259</td>
<td>45</td>
<td>50</td>
<td>359</td>
<td>989</td>
<td>154</td>
<td>92</td>
<td>48</td>
<td>98</td>
<td>476</td>
<td>538</td>
<td>454</td>
</tr>
<tr>
<td>Traumatic Brain Injury</td>
<td>392</td>
<td>25</td>
<td>--</td>
<td>--</td>
<td>0</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>19</td>
<td>--</td>
<td>13</td>
</tr>
<tr>
<td>Visual Impairments</td>
<td>646</td>
<td>10</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>13</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0</td>
<td>--</td>
<td>13</td>
<td>13</td>
</tr>
</tbody>
</table>

Note: -- Counts are not provided where the number of students<10. Autism can include certain areas under Autism Spectrum Disorder.

Source: Community Health Solutions analysis of 2014-2015 Virginia Department of Education Special Education Child Count data.

While Exhibit II-9A shows school-based data on special health care needs, Exhibit II-9B shows selected community-wide estimates for the study region. The estimates shown are for 2014, and include estimated counts and rates of youth age 0-17 with special health care needs related to autism, development delays, and intellectual disability.

### Exhibit II-9B
**Special Health Care Needs (2014 Estimates for Age 0-17)**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Study Region</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Counts (Estimates)</strong></td>
<td></td>
</tr>
<tr>
<td>Total Youth Age 0-17</td>
<td>335,012</td>
</tr>
<tr>
<td>Had Autism-defined as Autism, Asperger’s Disorder, pervasive development disorder, or other autism spectrum disorder (told by a doctor or other health professional)</td>
<td>6,419</td>
</tr>
<tr>
<td>Had Any Developmental Delay (told by a doctor or other health professional)</td>
<td>16,529</td>
</tr>
<tr>
<td>Had an Intellectual Disability (told by a doctor or other health professional)</td>
<td>4,571</td>
</tr>
</tbody>
</table>

| Rates (Percent Estimates)                                                |              |
| Had Autism-defined as Autism, Asperger’s Disorder, pervasive development disorder, or other autism spectrum disorder (told by a doctor or other health professional) | 1%           |
| Had Any Developmental Delay (told by a doctor or other health professional) | 2%           |
| Had an Intellectual Disability or Mental Retardation (told by a doctor or other health professional) | 1%           |

*Note: All indicators in this profile are estimates, and therefore subject to estimation error.*

*Source: Estimates produced by Community Health Solutions using National Survey of Children’s Health data and local demographic estimates from Alteryx, Inc. See Appendix B. Data Sources for details.*
Decades of research show that health coverage matters when it comes to overall health status, access to health care, quality of life, school and work productivity, and even mortality. As shown in Exhibit II-10 at a given point in time in 2014, an estimated 24,002 children age 0-18 in the study region were uninsured. An estimated 50% of the uninsured children had income at or below 200% of the federal poverty level (FPL). Note: Maps 18-19 in Appendix A show the geographic distribution of the uninsured population by zip code.

### Exhibit II-10.
Uninsured Children (Age 0-18) (Synthetic Estimates) 2014

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Study Region</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Estimated Uninsured Counts and Rate</strong></td>
<td></td>
</tr>
<tr>
<td>Total Children Age 0-18</td>
<td>355,016</td>
</tr>
<tr>
<td>Uninsured Children Age 0-18 All Income Levels (Percent)</td>
<td>7%</td>
</tr>
<tr>
<td>Uninsured Children Age 0-18 All Income Levels (Count)</td>
<td>24,002</td>
</tr>
<tr>
<td>Uninsured Children Age 0-18 &lt;=138% FPL</td>
<td>7,785</td>
</tr>
<tr>
<td>Uninsured Children Age 0-18 &lt;=200% FPL</td>
<td>12,049</td>
</tr>
<tr>
<td>Uninsured Children Age 0-18 &lt;=250% FPL</td>
<td>14,797</td>
</tr>
<tr>
<td>Uninsured Children Age 0-18 &lt;=400% FPL</td>
<td>19,672</td>
</tr>
</tbody>
</table>

Note: Federal poverty level (FPL) categories are cumulative. Please note that all indicators in this profile are estimates, and therefore subject to estimation error.

Source: Estimates produced by Community Health Solutions using U.S. Census Bureau Small Area Health Insurance Estimates (2014) and local demographic estimates from Alteryx, Inc. See Appendix B for details on methods.
Medically Underserved Areas (MUAs) and Medically Underserved Populations (MUPs) are designated by the U.S. Health Resources and Services Administration as being at risk for health care access problems. The designations are based on several factors including primary care provider supply, infant mortality, prevalence of poverty and the prevalence of seniors age 65+.

As shown in Exhibit II-11, nine of the 12 localities that encompass the study region have been fully or partially designated as MUAs/MUPs. For a more detailed description, visit the U.S. Health Resources and Services Administration designation webpage at http://muafind.hrsa.gov/.

### Exhibit II-11.
### Medically Underserved Areas

<table>
<thead>
<tr>
<th>Locality</th>
<th>MUA designation</th>
<th>Census Tracts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chesterfield County</td>
<td>Partial</td>
<td>2 of 71 Census Tracts</td>
</tr>
<tr>
<td>Colonial Heights City of</td>
<td>None</td>
<td>----</td>
</tr>
<tr>
<td>Fredericksburg City of</td>
<td>Partial</td>
<td>1 of 6 Census Tracts</td>
</tr>
<tr>
<td>Hanover County</td>
<td>None</td>
<td>----</td>
</tr>
<tr>
<td>Henrico County</td>
<td>Partial</td>
<td>2 of 64 Census Tracts</td>
</tr>
<tr>
<td>Hopewell City of</td>
<td>None</td>
<td>----</td>
</tr>
<tr>
<td>King George County</td>
<td>Full</td>
<td>5 of 5 Census Tracts</td>
</tr>
<tr>
<td>Petersburg City of</td>
<td>Full</td>
<td>11 of 11 Census Tracts</td>
</tr>
<tr>
<td>Powhatan County</td>
<td>Full</td>
<td>5 of 5 Census Tracts</td>
</tr>
<tr>
<td>Richmond City of</td>
<td>Partial</td>
<td>14 of 66 Census Tracts</td>
</tr>
<tr>
<td>Spotsylvania County</td>
<td>Partial</td>
<td>1 of 30 Census Tracts</td>
</tr>
<tr>
<td>Stafford County</td>
<td>Full</td>
<td>27 or 27 Census Tracts</td>
</tr>
</tbody>
</table>

*Source: Community Health Solutions analysis of U.S. Health Resources and Services Administration data.*
APPENDIX A: Zip Code Level Maps for the Study Region

The zip code level maps in this section illustrate the geographic distribution of the study region population on key demographic and health indicators. The results can also be used alongside the Community Insight Survey (Part I) and the Community Indicator Profile (Part II) to help inform plans for community health initiatives. The underlying data for these maps are provided in a separate Microsoft Excel file. The maps in this section include the following for 2013/2014:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Total Population (Age 0-21), 2014</td>
</tr>
<tr>
<td>4.</td>
<td>White Population Age (Age 0-21), 2014</td>
</tr>
<tr>
<td>5.</td>
<td>Hispanic Ethnicity Population Age (Age 0-21), 2014</td>
</tr>
<tr>
<td>6.</td>
<td>Low Income Family Households (Family Households with Income &lt;$35,000), 2014</td>
</tr>
<tr>
<td>7.</td>
<td>Total Deaths (Age 0-21), 2013</td>
</tr>
<tr>
<td>8.</td>
<td>Disorders Related to Short Gestation (Prematurity) and Low Birth Weight, Not Elsewhere Classified Deaths, 2013</td>
</tr>
<tr>
<td>9.</td>
<td>Homicide Deaths (Age 0-21), 2013</td>
</tr>
<tr>
<td>10.</td>
<td>Motor Vehicle Accident Deaths (Age 0-21), 2013</td>
</tr>
<tr>
<td>11.</td>
<td>Total Live Births, 2013</td>
</tr>
<tr>
<td>12.</td>
<td>Low Weight Births, 2013</td>
</tr>
<tr>
<td>13.</td>
<td>Births Without Early Prenatal Care (No Prenatal Care in the First 13 Weeks), 2013</td>
</tr>
<tr>
<td>14.</td>
<td>Births to Teen Mothers Under Age 18, 2013</td>
</tr>
<tr>
<td>15.</td>
<td>Pediatric Quality Indicator Hospitalization Discharges (Ages 0-17), 2013</td>
</tr>
<tr>
<td>17.</td>
<td>Estimated Youth Age 14-19 Overweight or Obese, 2014</td>
</tr>
<tr>
<td>18.</td>
<td>Estimated Uninsured Children Age 0-8, 2014</td>
</tr>
<tr>
<td>19.</td>
<td>Estimated Uninsured Children Age 0-18 with Income &lt;=200% Federal Poverty Level, 2014</td>
</tr>
</tbody>
</table>

**Technical Notes**

1. The study focuses on the Children’s Hospital of Richmond of the Virginia Commonwealth University Health System service area of 51 zip codes most of which fall within the counties of Chesterfield, Hanover, Henrico, King George, Powhatan, Spotsylvania and Stafford; and the cities of Colonial Heights, Fredericksburg, Hopewell, Petersburg and Richmond. Because zip code boundaries do not automatically align with city/county boundaries, there are some zip codes that extend beyond the county boundaries.

2. Rates are not mapped at the zip code level because in some zip codes the population is too small to support rate-based comparisons.

3. Data are presented in natural breaks.

4. Study region zip codes with zero values are noted.
Map 1: Total Population (Age 0-21), 2014

Source: Community Health Solutions analysis of estimates from Alteryx, Inc. See Appendix B. Data Sources for details.
Map 2: Asian Population (Age 0-21), 2014

Source: Community Health Solutions analysis of estimates from Alteryx, Inc. See Appendix B. Data Sources for details.
Map 3: Black/African American Population (Age 0-21), 2014

Source: Community Health Solutions analysis of estimates from Alteryx, Inc. See Appendix B. Data Sources for details.
Map 4: White Population (Age 0-21), 2014

Source: Community Health Solutions analysis of estimates from Alteryx, Inc. See Appendix B. Data Sources for details.
Map 5: Hispanic Ethnicity Population (Age 0-21), 2014

Hispanic Ethnicity (age 0-21) in
- 999 or below
- 1,000 to 1,799
- 1,800 to 2,599
- 2,600 to 3,399
- 3,400 and above

Source: Community Health Solutions analysis of estimates from Alteryx, Inc. See Appendix B, Data Sources for details.
Map 6: Low Income Family Households (Family Households with Income<$35,000), 2014

Source: Community Health Solutions analysis of estimates from Alteryx, Inc. See Appendix B. Data Sources for details.
Map 7: Total Deaths (Age 0-21), 2013

Note: There were no reported deaths for zip codes 22401, 23005, 23075, 23113, 23120, 23221, 23226, 23230, 23238, and 23836.

Source: Community Health Solutions analysis of estimates from Alteryx, Inc. See Appendix B. Data Sources for details.
Map 8: Disorders Related to Short Gestation (Prematurity) and Low Birth Weight, Not Elsewhere Classified Death (Infant), 2013

Note: There were no reported prematurity deaths for zip codes 22401, 23005, 23075, 23113, 23120, 23221, 23226, 23230, 23238, 23836, 22551, 22406, 23141, 23150, 23231, 23236, 22553, 23059, 23229, 23112, 23114, 22556, 23116, 23228, 23233, 23805, 23875, 22485, 23139, 23222, 23831, 22408, 23227, and 22554.

Source: Community Health Solutions analysis of estimates from Alteryx, Inc. See Appendix B. Data Sources for details.
Map 9: Homicide Deaths (Age 0-21), 2013

Note: There were no reported Homicide deaths for zip codes 22401, 23005, 23075, 23113, 23120, 23221, 23226, 23230, 23238, 23836, 22551, 22406, 23141, 23150, 23231, 23236, 22553, 23059, 23229, 23112, 23114, 22556, 23116, 23228, 23233, 23805, 23875, 23222, 22554, 23060, 22405, 23237, 23220, 23235, 23832, 23834, 22407, 23860, 23838, 23294, and 23111.

Source: Community Health Solutions analysis of estimates from Alteryx, Inc. See Appendix B. Data Sources for details.
Map 10: Motor Vehicle Accident Deaths (Age 0-21), 2013

Note: Motor vehicle traffic accident deaths for residents of the study region, not motor vehicle accident deaths occurring in the study region. There were no reported Motor Vehicle Accident deaths for zip codes 22401, 23005, 23075, 23113, 23120, 23211, 23226, 23230, 23238, 23836, 22551, 22406, 23141, 23150, 23231, 23236, 22553, 23059, 23229, 23112, 23116, 23228, 23233, 23805, 22554, 23060, 22405, 23237, 23220, 23235, 22407, 23860, 23838, 23294, 23139, 22408, 23227, 23223, 23225, 23803, and 23224.

Source: Community Health Solutions analysis of estimates from Alteryx, Inc. See Appendix B. Data Sources for details.
Map 11: Total Live Births, 2013

Source: Community Health Solutions analysis of data from the Virginia Department of Health. See Appendix B. Data Sources for details.
Map 12: Low Weight Births, 2013

Source: Community Health Solutions analysis of data from the Virginia Department of Health. See Appendix B. Data Sources for details.
Map 13: Births Without Early Prenatal Care (No Prenatal Care in the First 13 Weeks), 2013

Note: There were no reported births without early prenatal care for zip code 23120.

Source: Community Health Solutions analysis of data from the Virginia Department of Health. See Appendix B. Data Sources for details.
Map 14: Births to Teen Mothers Under Age 18, 2013

Note: There were no reported births to teen mothers under age 18 for zip codes 23120, 23838, 23114, 23141, and 23059

Source: Community Health Solutions analysis of data from the Virginia Department of Health. See Appendix B. Data Sources for details
Map 15: Pediatric Quality Indicator Discharges (Age 0-17), 2013

Source: Community Health Solutions analysis of hospital discharge data from Virginia Health Information. See details on methods in Appendix B.
Map 16: Behavioral Health Hospitalization Discharges (Age 0-21), 2013

Source: Community Health Solutions analysis of hospital discharge data from Virginia Health Information. See details on methods in Appendix B.
Map 17: Estimated Youth Age 14-19 Overweight or Obese, 2014

Source: Estimates based on Community Health Solutions analysis of Virginia Youth Risk Behavioral Surveillance System data and estimates from Alteryx, Inc. See Appendix B. Data Sources for details.
Map 18: Estimated Uninsured Children Age 0-18, 2014

Source: Estimates of uninsured are based on Community Health Solutions analysis of U.S. Census Bureau Small Area Health Insurance Estimates (2013) and demographic data from Alteryx, Inc. (2014). See Appendix B. Data Sources for details.
Map 19: Estimated Uninsured Children Age 0-18 with Income $\leq 200\%$ Federal Poverty Level, 2014

Source: Estimates of uninsured are based on Community Health Solutions analysis of U.S. Census Bureau Small Area Health Insurance Estimates (2013) and demographic data from Alteryx, Inc. (2014). See Appendix B. Data Sources for details.
## Zip Code Map Table

<table>
<thead>
<tr>
<th>Zip Code</th>
<th>Area</th>
<th>Entire</th>
<th>Mail</th>
<th>P.O. Box</th>
<th>Road</th>
<th>Lake</th>
<th>Airport</th>
<th>Mountain</th>
<th>Forest</th>
<th>Agricultural Land</th>
<th>Urban</th>
<th>Rural</th>
</tr>
</thead>
</table>

*Note: The above table is a simplified representation. Actual data may vary depending on the source.*
# APPENDIX B: Data Sources

<table>
<thead>
<tr>
<th>Section</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Part I: Community Insight Profile</strong></td>
<td>Community Health Solutions analysis of Community Insight Survey responses submitted by community professionals and parent/caregivers of Children's Hospital of Richmond of the Virginia Commonwealth University Health System patients.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Section</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Part II: Community Indicator Profile</strong></td>
<td>Community Health Solutions analysis of population estimates from Alteryx, Inc. (2014 and 2019). Alteryx, Inc., a commercial vendor of demographic data. Note that demographic estimates may vary from other sources of local demographic indicators.</td>
</tr>
<tr>
<td>1) Health Demographic Trend Profile</td>
<td>Community Health Solutions analysis of Virginia Department of Health death record data (2013). The study region counts and rates were produced by Community Health Solutions.</td>
</tr>
<tr>
<td>2) Health Demographic Snapshot Appendix A: Maps 1-6</td>
<td>Community Health Solutions analysis of Virginia Department of Health birth record data (2013). The study region counts and rates were produced by Community Health Solutions.</td>
</tr>
<tr>
<td>3) Mortality Profile Appendix A: Maps 8-10</td>
<td>Community Health Solutions analysis of hospital discharge data from the Virginia Health Information (VHI) dataset (January 1-December 31, 2014) and demographic data from Alteryx, Inc. (2014). Data include discharges for Virginia residents from Virginia hospitals reporting to Virginia Health Information, Inc. These data do not include discharges from state behavioral health facilities or federal (military) facilities. Data reported are based on the patient's primary diagnosis.</td>
</tr>
<tr>
<td>4) Maternal and Infant Health Profile Appendix A: Maps 11-14</td>
<td>Community Health Solutions analysis of hospital discharge data from the Virginia Health Information (VHI) dataset (January 1-December 31, 2014) and demographic data from Alteryx, Inc. (2014). Data include discharges for Virginia residents from Virginia hospitals reporting to Virginia Health Information, Inc. These data do not include discharges from state behavioral health facilities or federal (military) facilities. Data reported are based on the patient’s primary diagnosis.</td>
</tr>
<tr>
<td>5) Pediatric Quality Indicators Hospitalization Profile</td>
<td>Community Health Solutions analysis of hospital discharge data from the Virginia Health Information (VHI) dataset (January 1-December 31, 2014) and demographic data from Alteryx, Inc. (2014). Data include discharges for Virginia residents from Virginia hospitals reporting to Virginia Health Information, Inc. These data do not include discharges from state behavioral health facilities or federal (military) facilities. Data reported are based on the patient’s primary diagnosis.</td>
</tr>
<tr>
<td>6) Behavioral Health Hospitalization Profile Appendix A: Maps 15-16</td>
<td>Community Health Solutions analysis of hospital discharge data from the Virginia Health Information (VHI) dataset (January 1-December 31, 2014) and demographic data from Alteryx, Inc. (2014). Data include discharges for Virginia residents from Virginia hospitals reporting to Virginia Health Information, Inc. These data do not include discharges from state behavioral health facilities or federal (military) facilities. Data reported are based on the patient’s primary diagnosis.</td>
</tr>
<tr>
<td><strong>Pediatric Quality Indicators Hospitalization</strong></td>
<td>The Agency for Healthcare Research and Quality (AHRQ) defines a set of conditions (called Pediatric Quality Indicators, or “PDIs”) for which hospitalization should be avoidable with proper outpatient health care for pediatric patients age 0-17. The PDI definitions are detailed in their specification of ICD-9 diagnosis codes and procedure codes. Not every hospital admission for bacterial pneumonia, etc. is included in the PDI definition; only those meeting the detailed specifications. Only PDIs specific to Pediatric Quality Indicators hospitalizations are included in this report. PDIs focused on potentially preventable complications and iatrogenic events for pediatric patients treated in hospitals were excluded. For more information, visit the AHRQ website at <a href="http://www.qualityindicators.ahrq.gov/Modules/pdi_overview.aspx">http://www.qualityindicators.ahrq.gov/Modules/pdi_overview.aspx</a>.</td>
</tr>
<tr>
<td><strong>Behavioral Health Hospitalizations</strong></td>
<td>Behavioral health data reported are based on the patient’s primary diagnosis.</td>
</tr>
<tr>
<td><strong>Rehabilitation Hospitalizations</strong></td>
<td>Injury and rehabilitation data reported are based on the patient’s primary diagnosis/procedure code. This study analyzed hospitalizations for a list of eight diagnoses or procedures selected in consultation with Children’s Hospital of Richmond of the Virginia Commonwealth University Health System staff.</td>
</tr>
</tbody>
</table>

**NOTE:** Virginia Health Information (VHI) requires the following statement to be included in all reports utilizing its data: VHI has provided non-confidential patient level information used in this report which was compiled in accordance with Virginia law. VHI has no authority to independently verify this data. By accepting this report the requester agrees to assume all risks that may be associated with or arise from the use of inaccurately submitted data. VHI edits data received and is responsible for the accuracy of assembling this information, but does not represent that the subsequent use of this data was appropriate or endorse or support any conclusions or inferences that may be drawn from the use of this data.
<table>
<thead>
<tr>
<th>8) Youth Health Risk Factor Profile</th>
<th>Estimates of risk behaviors for youth age 14-19 and 10-14 were produced by Community Health Solutions using:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appendix A: Map 17</td>
<td>• Data from the Virginia Youth Risk Behavioral Surveillance System from the Centers for Disease Control (2013). For more information on YRBSS visit: <a href="http://www.cdc.gov/HealthyYouth/yrbs/index.htm">http://www.cdc.gov/HealthyYouth/yrbs/index.htm</a></td>
</tr>
<tr>
<td></td>
<td>• Local demographic estimates from Alteryx, Inc. (2014).</td>
</tr>
<tr>
<td></td>
<td>Estimates are used when there are no primary sources of data available at the local level. The estimates are for planning purposes only and are not guaranteed for accuracy. The statistical model to produce the local estimates was developed by Community Health Solutions. In this model, state-level data were used to predict local counts and rates, with adjustments for local demographics. Consequently, differences between local rates and state rates may reflect estimation error rather than valid differences. Therefore, state-level estimates are not provided in this report. Because of data limitations, it is not possible to assign specific margins of error or levels of significance to these statistical estimates. Likewise, it is not possible to calculate the statistical significance of differences between local rates and state rates.</td>
</tr>
<tr>
<td>9) Special Healthcare Needs Profile</td>
<td>• Community Health Solutions analysis of 2013-2014 Virginia Department of Education, Special Education Child Count data.</td>
</tr>
<tr>
<td></td>
<td>• Statewide Virginia results from the National Survey of Children’s Health (2011-2012)</td>
</tr>
<tr>
<td></td>
<td>• Local demographic estimates from Alteryx, Inc. (2014).</td>
</tr>
<tr>
<td></td>
<td>Estimates are used when there are no primary sources of data available at the local level. The estimates are for planning purposes only and are not guaranteed for accuracy. The statistical model to produce the local estimates was developed by Community Health Solutions. In this model, state-level data were used to predict local counts and rates, with adjustments for local demographics. Consequently, differences between local rates and state rates may reflect estimation error rather than valid differences. Therefore, state-level estimates are not provided in this report. Because of data limitations, it is not possible to assign specific margins of error or levels of significance to these statistical estimates. Likewise, it is not possible to calculate the statistical significance of differences between local rates and state rates.</td>
</tr>
<tr>
<td>10) Uninsured Profile</td>
<td>Estimates of uninsured nonelderly age 0-64 were produced by Community Health Solutions using:</td>
</tr>
<tr>
<td></td>
<td>• Local demographic estimates from Alteryx, Inc. (2014)</td>
</tr>
<tr>
<td></td>
<td>Estimates are used when there are no primary sources of data available at the local level. The estimates are for planning purposes only and are not guaranteed for accuracy. The statistical model to produce the local estimates was developed by Community Health Solutions. In this model, prior year locality-level rates were used to predict current year local level counts and rates, with adjustments for local demographics. Because of data limitations, it is not possible to assign specific margins of error or levels of significance to these statistical estimates. Moreover, populations in group living quarters (e.g. colleges) and undocumented populations may not be adequately addressed in this model.</td>
</tr>
<tr>
<td>11) Medically Underserved Profile</td>
<td>Community Health Solutions analysis of U.S. Health Resources and Services Administration data. For more information, visit: <a href="http://muafind.hrsa.gov/">http://muafind.hrsa.gov/</a></td>
</tr>
</tbody>
</table>