Transforming Population Health: Case Studies of Place-Based Approaches

The following is one in a series of four case studies that provide examples of place-based, multi-sector, population-based approaches to chronic disease prevention and health promotion. Many of these initiatives are working to achieve the Triple Aim, and they have varying levels of evidence of their progress towards meeting each of the three aims of better health, improved care experience, and reduced costs. All of the cases include evidence of improvements in health outcomes, and some also show improvements in quality of care. A subset include evidence of reductions in utilization of health care services, and a few include data on concomitant cost reduction.

Nemours developed these cases to provide examples of population health innovation in the field. For the purpose of these case studies, the working definition of a “population health initiative” is one that attempts to impact the interrelated conditions and factors that influence the health of populations over the life course, be they social, economic, or physical environments; personal health practices; individual capacity and coping skills; human biology; early childhood development; and/or health services. The initiatives outlined in these case studies identify systemic variations in these interrelated conditions and factors and use the resulting knowledge to develop and implement policies and actions to improve the health and well-being of geographic populations. The glue that binds each initiative is the presence of an “integrator” that serves a convening role and works at a systems level to promote prevention and improve health and well-being. The cases span the country, illustrating successful models that improve the health of geographically defined communities in rural, suburban and urban areas; states; chronic disease populations; and populations defined by risk factors and/or socio-demographics.

While all the cases describe initiatives that are specific to their communities or states, they share common features. These population-based prevention initiatives:

1. Target a geographic population;
2. Focus on achieving a shared health outcome, which is usually prevention-related;
3. Engage public and private partners in multiple sectors, including community (child care, schools, work places, etc.), as well as health/health care;
4. Change policies at the systems level and practices at the individual, provider/practitioner level;
5. Use data to measure progress and continually improve interventions;
6. Work toward sustainability via innovative financing, for example developing new funding sources and payment mechanisms and reducing health care costs; and
7. Are facilitated by an “integrator”, an entity operating at the systems or population level to promote the health and well-being of a geographically defined population. An integrator is needed since historically the “systems” serving children and families are disconnected, funded by different sources, and therefore rarely well coordinated to meet the needs of individuals, families and communities. A wide array of organizations can assume the role of integrator, depending upon the requirements of the initiative, the context of the community, and the capabilities and resources of various stakeholders.
Cases studies outlining population-based approaches to prevention and wellness, all of which involve these seven common features, are cited below.

**Nemours**  
Nemours works with partners in child care, schools, primary care and the community to halt and ultimately reverse the growing prevalence of childhood obesity among children in Delaware. To ensure sustainability, Nemours pursued both systems/policy and practice changes in these sectors where children spend most of their time. Preliminary results show a flattening of the overweight and obesity curve for Delaware children ages 2 to 17 between 2006 and 2008.iii

**Children’s Hospital Boston Community Asthma Initiative**  
Children’s Hospital Boston created a comprehensive program that increases the capacity of health care providers, schools, and community groups to offer asthma education. They coupled this program with a Medicaid waiver to pay for bundled pediatric asthma services for high-risk patients, including coverage of non-traditional home visits and interventions by community health workers. For 800 children treated through September, 2011, significant reductions were achieved in emergency department visits and hospital admissions, and quality of life was improved for children and their parents, with dramatic results in just 6 months.

**REACH Charleston and Georgetown Diabetes Coalition, South Carolina**  
The School of Nursing at the Medical University of South Carolina, in partnership with the multi-sector Racial and Ethnic Approaches to Community Health (REACH) Coalition, focuses on eliminating racial and ethnic disparities in diabetes in the African-American community, as measured by reductions in the lower-extremity amputation rate. In Charleston and Georgetown counties, rates of amputations per 1,000 diabetes hospitalizations decreased among African Americans. Clinical quality, evaluated based on annual chart audits from 1999 on, improved on a range of process and intermediate outcome measures, including annual foot exams, HbA1c control, and adherence to American Diabetes Association guidelines for self-management.

**Steps to Health King County, Seattle**  
Public Health—Seattle & King County (PHSKC) convened the Steps KC collaborative, which involved more than 75 organizations working together to promote a comprehensive approach that coordinates programs and policy and systems changes at the individual, family, clinical, school and community levels. The goal of reducing the impact of chronic diseases through preventing and controlling asthma, diabetes and obesity is beginning to be realized, as evidenced by healthier behaviors, improved diabetic control, decreased days with asthma symptoms, and utilization reductions in asthma-related emergency room visits and hospitalizations.
Overview

Initiative/Intervention

Nemours, an integrated child health system in the Delaware Valley and Northern and Central Florida, is spearheading a statewide initiative to halt and ultimately reverse the growing prevalence of overweight and obesity among children in Delaware. Nemours takes a multi-sector, collaborative approach to make sustainable systems changes that will help Delaware youth adopt healthier lifestyles. The socio-ecological strategy reaches beyond clinical encounters to promote healthy behaviors at multiple levels by changing complex systems that serve children, such as education and child care. This approach builds on the premise that community-based prevention integrated with pediatric health care is more effective than clinical care alone to address the root causes of disease and disability (see Attachment).

Nemours began its work on the “Campaign to Make Delaware’s Children the Healthiest in the Nation” by defining the target population and a shared outcome. The first initiative was to slow the growth in child overweight/obesity among the population ages 2 to 17, and the longer-term goal was to reduce the prevalence of child overweight/obesity by 2015. To accomplish this goal, Nemours established multi-sector partnerships where kids live, learn and play, with a focus on child care, schools, primary care and other youth-serving community settings. Nemours also pursued systems change and practice change in these sectors. This included the establishment of learning collaboratives in the identified sectors, as well as the provision of tools and technical assistance, using a train-the-trainer model. A “5-2-1-Almost None” healthy lifestyles social marketing campaign, as well as systems changes at the state level, complemented these efforts. Additionally, Nemours leveraged its Electronic Health Record (HER) to establish a childhood obesity quality improvement initiative that alerts users when a patient’s BMI is above the healthy weight range and outlines appropriate follow-up and counseling for families.

Lead Organization, Integrator and Key Partners

Nemours Health and Prevention Services (NHPS) is an operating unit of Nemours created in 2004 to work with community partners to identify and address the root causes of childhood morbidity and mortality. It took on the role as the integrator that convened key partners and worked at a systems level to promote obesity prevention among Delaware’s children.

Key partners include, but are not limited to:

- Delaware Governor’s Office and Cabinet secretaries and their staff
- Primary care pediatric providers and their office staff
- Child care center directors and staff
- School districts/superintendents across the state
- YMCA of Delaware, Boys and Girls Clubs, and 4H Clubs
- Sussex County Child Health Promotion Coalition, a coalition first convened by Nemours and now a self-sustaining 501(c)(3)
Target Population/Geographic Area

- All children and youth ages 2 - 17 in Delaware

Outcome Measures/Evidence to Date

- Based on statewide representative household surveys of parents, preliminary results show a flattening of the overweight and obesity curve for Delaware children ages 2 -17 between 2006 and 2008.
- Significant positive behavior changes in children between 2006 and 2008:
  - Eating at least 5 servings of fruits and vegetables a day (45.7% to 51.8%);
  - Limiting screen time to no more than 2 hours per day (57.8% to 66.9%);
  - Drinking almost no sugary beverages (47.6% to 55.2%).

Year Initiated

2006
Full Description of Specific Initiative around Obesity Prevention

Goal
By 2015, reduce the prevalence of overweight and obesity among Delaware’s children ages 2 – 17 as measured by BMI at or above the 85th percentile.

Intermediate Objectives
- Slow the growth in childhood overweight/obesity
- Change awareness, knowledge, attitudes, and beliefs about healthy eating and physical activity among children and families by promoting healthy lifestyle messages
- Change healthy eating and physical activity behaviors of children and families
- Change healthy eating and physical activity policies and practices in the places where children spend the most time, specifically schools, child care, primary care, and youth-serving organizations

Problem Addressed
Childhood overweight/obesity is a critical public health problem with devastating consequences.
- A growing epidemic: The prevalence of obesity (defined as a body mass index, or BMI, above the 94th percentile) among children and adolescents has increased rapidly in recent decades, both nationally and in Delaware. By 2006, approximately 17% of Delaware children ages 2 to 17 were overweight (BMI between the 85th and 94th percentiles), with another 20.6% being obese.
- Poor health-related behaviors: High rates of overweight/obesity stem from poor health-related behaviors, including unhealthy diets and lack of physical activity. These poor behaviors, in turn, are partly the result of systems that fail to make the healthy choice the easy choice.
- Severe health consequences: Overweight and obesity put children at current and future risk of serious health problems, including cardiovascular disease, Type 2 diabetes, and mental health conditions, such as anxiety and depression.
- Lack of comprehensive, population-based approaches: Many factors at multiple levels (e.g., the individual/family, community, state, and society at large) have combined to create the epidemic, and no single factor is likely to reverse it. As a result, many experts believe that the only solution is a broad-based, multifaceted strategy that few communities have attempted thus far.

Interventions, Target Populations/Key Partners
Nemours developed an easy-to-remember evidence-based prescription for a healthy lifestyle—5-2-1-Almost None—to encourage 4 daily evidence-based behaviors:
- Eat at least 5 servings of fruits and vegetables;
- Engage in no more than 2 hours of recreational time in front of television or computer screens;
- Participate in at least 1 hour of moderate to vigorous physical activity; and
- Consume almost no sugar-sweetened beverages weekly.

To implement and spread this prescription statewide, Nemours identified key policy and practice changes necessary to improve the systems in sectors where children spend time. Interventions were selected based on the best available evidence or science; reaching the greatest number of children; using resources efficiently; and having the potential for sustainability. These interventions were implemented via strategic partnerships, using collaboratives and tools for knowledge mobilization such as best practice guides.
Systems Interventions

- **Child care**: in 2007, child care regulations were adopted statewide to promote healthy eating/physical activity, working with the Office of Child Care Licensing and the Child and Adult Care Food Program (CACFP). These standards affect 54,000 children annually in all licensed child care programs in Delaware, both center-based and family-based.

- **Schools**: leveraging the federal law that requires all districts participating in the National School Lunch Program to create local wellness policies, Nemours engaged the majority of Delaware school districts in a Wellness Policy Collaborative to help districts assess and implement their wellness policies, including assessing student fitness (i.e. Fitnessgram) and promoting 150 minutes of physical activity per week.
  - With Nemours advocacy and endorsement, Delaware passed legislation requiring public and charter school students to complete a physical fitness assessment at least once at the elementary, middle, and high school levels.
  - Recently the legislature and the State Board of Education passed resolutions encouraging schools to provide students with a minimum of 150 minutes of physical activity per week.
  - Separate legislation provided resources to assist with implementation of 150 minutes of physical education/activity per week in a pilot program that has since expanded to 74 schools (representing 71% of all elementary schools), in part through funding from a U.S. Department of Education grant.

- **Primary care**: through the Delaware Chapter of the American Academy of Pediatrics, Delaware Academy of Family Physicians, and the Medical Society of Delaware, Nemours encouraged the adoption of Expert Committee Recommendations on Assessment, Prevention, and Treatment of Child and Adolescent Overweight among all primary care providers.

Practice Interventions

- **Child care**: a Child Care Learning Collaborative supported 28 large child care centers with tools, training and technical assistance to use in aligning their policies and practices with the new state regulation; Delaware’s Institute for Excellence in Early Childhood will continue this collaborative for 2010 on, creating a sustainable professional education system. The model was further leveraged at the national level through Let’s Move Child Care, a program in the Office of the First Lady.

- **Schools**: a District Learning Collaborative was established for school districts to provide tools, training, and technical assistance for implementation of wellness policies and to support implementation of pilot programs to promote physical activity (i.e. CATCH, Coordinated Approach to Child Health). Representatives from 142 public and charter schools from 14 districts participated, representing approximately 72% of Delaware students.

- **Primary care**: 19 multi-disciplinary primary care teams participated in the Primary Care Quality Initiative on Childhood Overweight
  - Throughout all clinical services at Nemours BMI measurement was made a strategic priority. The EMR system was modified to include a prompt to alert users of a BMI above the healthy weight range, an electronic clinical protocol to assess and counsel families regarding targeted lifestyle behaviors, and a reminder to screen for co-morbidities of overweight, as necessary. Progress is monitored via the EMR, physician, and organizational dashboards.
Social Marketing

- Nemours launched a social marketing campaign to create urgency around the need to address obesity, spread the 5-2-1-Almost None message and accelerate its adoption by both policy makers and families.

Partnering with Community Organizations

- Nemours works with a variety of youth-serving community organizations, such as the YMCA, Boys and Girls Clubs, and 4H Clubs, to spread the 5-2-1-Almost None message and promote adoption of evidence-based programs. Nemours provides initial training to organizational leaders, who then implement healthy eating and physical activity programs. For example, Nemours worked with the Delaware Parks and Recreation Department to offer healthier food options in park vending machines, helped communities institute “community walk days,” and incorporated the 5-2-1-Almost None message into public events, such as the state fair.

Nemours acted as a convener for county coalitions, such as the Sussex Child Health Promotion Coalition. This multi-sector coalition is now a self-sustaining 501(c)(3) that involves strategic partners in one community working toward a shared goal of improved child health.

Nemours as the Integrator

The integrator operates at the systems or population levels and is meant to ensure that the capacity is in place for supporting overall growth and development of children. It is not necessarily a new structure or a single organization but rather an entity that can pull together the resources of numerous organizations to form a virtual system to support a defined population and make sure that the system is optimized for the sake of the defined population. It helps to link organizations across the continuum of care and services in the community. Nemours has performed many of the functions as an integrator in Delaware. Specifically:

- Advancing systems change at the state level to promote healthy eating and physical activity for all of Delaware’s children, not simply those served by Nemours;
- Convening and working with community partners, within and beyond the health sector, and engaging them in shared learning through collaboratives in key sectors that influence the health of children: child care, schools, primary care and other community-based settings;
- Leveraging the Electronic Health Record to establish a childhood obesity quality improvement initiative and working with partners in the state, such as the Delaware Health Information Network, to facilitate data systems linkages;
- Partnering with other community entities on multiple fronts to collect data on a regular basis at a population level to measure outcomes (e.g. the Delaware Survey of Children’s Health, Delaware Fitnessgram, etc.) and to assess what is happening in the community to build upon what is already working well, help to accelerate and spread what is working, or catalyze innovation;
- Developing tools and web sites to spread knowledge and learnings about what works, for stakeholders in Delaware, as well as across the country; and
- Providing training and technical assistance relating to healthy eating, physical activity and screen time reduction to providers who care for children in order to spread best practices and ensure sustainable systems change.

Ultimately, through its convening role and its critical role in creating sustainable systems and practice changes, Nemours is working to impact population health, a key role of an integrator.
Evaluation/Measurement Strategy
A quasi-experimental evaluation design, documenting and measuring specific indicators (related to knowledge, attitude and behavior changes and Body Mass Index (BMI)), assesses the aggregate impact of systems and practice changes in the child’s environment and on population behaviors over time. This evaluation captures the degree of practice and system changes occurring at the state and local levels that are likely to facilitate and sustain population-level changes in the long term. Three population-level data sources were used. The data is used to continually improve the programs and initiative.

(1) Nemours’ statewide Delaware Survey of Children’s Health, a representative sample of Delaware children ages birth through age 17 years. Administered in 2006 and 2008, this random-digit dialing survey captures data on parent/caregiver reported attitudes, knowledge, beliefs and behaviors regarding healthy eating and physical activity. In addition, height and weight were validated with provider records for a sample of children ages 2 years to 17 years.

(2) Nemours’ EHR, a computer-based record containing patients’ demographic information, medical history, and primary care and specialty care visits.

(3) The state Department of Education’s Fitnessgram, a series of tests that assess children’s physical fitness in a number of areas, including cardiovascular fitness and muscle endurance and flexibility.

Measurements for system-level outcomes at the district and school levels, such as availability of universal breakfast and opportunities for physical activity, were obtained from the national School Health Policies and Programs Study. Other quantitative and qualitative data that were used to measure systems and populations changes include pre- and post-learning collaborative surveys, policy analyses, focus groups, interviews with participants and direct observation.

Results to Date

- **Population health indicators:** Preliminary results from the 2008 Delaware survey suggest that the prevalence of overweight (BMI at the 85th to 94th percentiles) and obesity (95th percentile and higher) for Delaware children ages 2–17 has not changed significantly since measured in 2006. The prevalence of overweight remained the same at approximately 17%. The prevalence rate of obesity changed from 20.6% to 24.2%—a change that is considered not statistically significant. This leveling off indicates the initiative is on track to achieve its 2015 goal for some population groups.

- **Changes in household awareness of 5-2-1-Almost None:** based on the Delaware survey, household awareness increased 4-fold, from 5% to 19% between 2006 and 2008.
  - Where there was parental awareness, significantly more children engaged in one hour of physical activity per day (10% vs. 26%) and in moderate to vigorous activity for more than 20 minutes per day (21% vs. 33%).

- **Progress in the school sector:** schools were 4 times more likely to report wellness policy implementation, as measured by school-level practice changes, if their district’s policy had specific Nemours-recommended content.
  - Using 5 Fitnessgram tests selected by the Delaware Department of Education, results showed that pilot schools increased students’ physical fitness across time.
  - Preliminary evidence suggests that students enrolled in 150 minutes per week of structured physical education or physical activity, such as CATCH or Take 10!, had higher rates of physical fitness than students in unstructured programs. These findings helped spark
expansion of physical activity programs from 19 to 86 schools, 62% of elementary and middle schools.

- Additionally, a higher proportion of pilot-school students were physically fit compared with a matched control group.
- A study released in 2011 showed that students in Delaware schools who are physically active and fit perform significantly better in both mathematics and reading and students who are less fit not only score lower academically, but also tend toward more suspension days and absenteeism.

- **Progress in the child care sector**: major policy changes regarding healthy eating and physical activity were made by 81% of centers participating in the Learning Collaborative. One hundred percent made policy changes in one of those areas. Positive changes were demonstrated in all aspects of 5-2-1-Almost None. Providers’ knowledge of childhood obesity as a problem increased, as did their knowledge of the importance of healthy eating/physical activity for positive adult development and the importance of adult role modeling. After a second round of training for 1200 providers, funded by a USDA Team Nutrition grant, 88% of training participants said the training made it easier to follow the nutrition regulations; and 92% said the tool kit made it easier.

- **Progress in the primary care sector**: based on data collected from the medical records of teams participating in the Collaborative, (1) 98.2% of providers classified BMI or weight-for-length in 2009, compared to 83% in 2007; (2) 88.6% of providers provided counseling on healthy lifestyles in 2009, compared to 72.7% in 2007; and (3) 88.1% of providers developed a care plan and family management goals with their obese or overweight patients who were ready to change in 2009, compared to 74.2% in 2007.

Within Nemours, the number of providers across all service lines notating BMI during well-child visits almost doubled between 2007 and 2008, from 49% to 94%. Providers offered lifestyle counseling to 95% of patients in primary care practices, almost double the national rate of 54.5%.

**Program Funding Sources**

- Nemours funds program-related activities out of the operating budget for Nemours Health and Prevention Services. As of March, 2011, approximately 40 of 60 full-time NHPS staff focus on initiatives related to overweight/obesity. Partner organizations pay the labor and other expenses associated with implementation of program activities.

- The Robert Wood Johnson Foundation has provided grant funding to enhance evaluation efforts in the school and child care settings and to assist with data collection through the Delaware Survey for Children’s Health and other methods.

- Grants from the Carolyn M. White Physical Education Program at the U.S. Department of Education have supported programs designed to increase physical activity in schools.

- A USDA Team Nutrition grant supported training for 1,200 child care providers.

**Current Status/Future Plans**

Given the success of the obesity initiative, Nemours is broadening its focus to other place-based population health problems, including the social, emotional and behavioral health of children.
Nemours developed these case studies to provide examples of population health innovation in the field. This case study was prepared by Julianne R. Howell, PhD, Anne De Biasi, MHA, Daniella Gratale, MA and Debbie I. Chang, MPH, using the following sources, and was issued in January, 2012:

1. Ongoing conversations with Anne De Biasi, Director of Child Health Policy and Advocacy, and Daniella Gratale, Manager of Advocacy, Nemours.
Connecting Clinical Care and Population Health
An Integrated Health System

Our Community
- Resources, Policies and System Change
  - Health Policy
  - Health Promotion Practice Change
  - Self-Management Support

Our Health System
- Health Care Organization
  - Delivery System Design
  - Decision Support
  - Clinical Information Systems

Informed, Activated Patient, Family and Community Partners

Productive Interactions & Spreading Change

Organized, Prepared, Proactive Health Team with patient/family

Improved Health Among Patients
Improved Health for Delaware’s Children

Source:
Chang, Hassink, Werk, October, 2011