San Diego Healthy Weight Collaborative: A Systems Approach to Address Childhood Obesity

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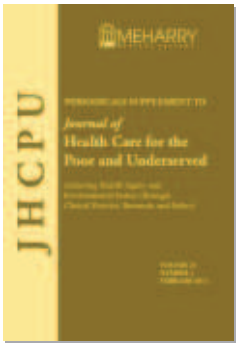

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San Diego Healthy Weight Collaborative: A Systems Approach to Address Childhood Obesity

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Abstract: A collaborative approach to identify opportunities for interactions between multiple systems is an important model for childhood obesity prevention. This paper describes a process aligning multiple partners in primary care, public health, university research, schools, and community organizations. Jointly implemented strategies in a Latino underserved community included: (1) building an effective and sustainable collaborative team; (2) disseminating a healthy weight message across sectors; (3) assessing weight status and healthy weight plans in primary care, school, and early childhood settings; and (4) implementing policy changes to support healthy eating and physical activity. The process and lessons learned were analyzed so other communities can utilize a systems approach to develop culturally appropriate interventions tailored to a specific community.

Key words: Childhood obesity, systems approach, multi-sector approach, Latino community.

Obesity trends tracked over the past three decades demonstrate alarming rates in children[1] even in the face of recent indications of some leveling off or decrease in obesity prevalence.[2,3] One in three children ages 6–19 are overweight or obese, with higher rates among ethnic and racial minorities.[4,5] Evidence continues to demonstrate that obesity is associated with increased risk of multiple medical conditions including Diabetes Mellitus Type 2, cardiovascular disease, Fatty Liver Disease, and mental health issues.[6–8]

Several potentially modifiable factors leading to high rates of obesity[7–9] include: limited access to healthy foods such as fresh fruits and vegetables; easy access to high

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The San Diego Healthy Weight Collaborative is one of 10 teams selected by the National Initiative for Children's Healthcare Quality (NICHQ) and Health Resources and Services Administration (HRSA) to develop a systems approach to address childhood obesity. ***DRS. SERPAS, BRANDSTEIN,*** *and* ***MCKENNETT*** *are affiliated with the Scripps Mercy Family Medicine Residency Program in San Diego,* ***MS. HILLIDGE*** *with the Chula Vista Elementary School District in San Diego, and* ***MS. ZIVE*** *and* ***DR. NADER*** *are affiliated with the University of California, San Diego. Please address correspondence to Shaila Serpas, MD; 499 H Street, Chula Vista, CA 91910; Serpas.shaila@scrippshealth.org.*

Box 1.
SYSTEMS APPROACH

What is Meant by Systems Thinking?

A systems approach:

- explicitly designs intervention strategies to focus on interactions and interconnections (integration) between different sectors in the community, and between the individuals and their environment in that community.
- accounts for the context and characteristics of a community in planning intervention strategies in order to see the whole picture so that intended and unintended consequences of intervention strategies can be recognized and strategies altered if required.
- utilizes a multidisciplinary approach, including community experts, to determine proposed interactions among systems and sectors that will be required to result in feasible interventions that are sustainable (persistence of changes made and ongoing adoption of new ones); scalable (an intervention can be brought to scale to impact many settings); and have reach (across cultural and language population sub-groups).

caloric snacks and beverages; lack of physical activity; unsafe recreation spaces and high traffic areas; excessive screen time; and limited access to health care.

Causes of obesity are complex and require systems approaches to sustain change.[10–13] The Institute of Medicine supports interventions that are systems approaches involving the individual, family, health care systems, community organizations, schools, early childhood education, businesses, and government.[14–19] Box 1 illustrates three main characteristics of a systems approach.[20,21] There is a growing momentum to coordinate these approaches within a variety of communities with positive outcomes.[22–26]

The San Diego Healthy Weight Collaborative (SDHWC) is one of 10 teams selected by the National Initiative for Childrens Healthcare Quality (NICHQ) and Health Resources and Services Administration (HRSA) to develop systems approaches to address childhood obesity.[27]

The SDHWC consists of a consortium of diverse organizations sharing a common interest in childhood obesity prevention. All partners share common beliefs including: (1) change cannot be recognized unless it is measured; (2) obesity causation is complex and requires a systems approach to obtain sustainable impacts; and, (3) active learning for all sectors and stakeholders is required for collaboration and progress to break the status quo.

Several of the SDHWC partners have an extensive seven-year history of cross-sector work devoted to childhood obesity prevention in Chula Vista. The California Endowment previously funded a five-year Healthy Eating Active Communities[28–30] (HEAC) demonstration project involving the public health department, primary healthcare providers, local government, schools, and neighborhood grass-roots organizations

including lay health promoters. HEAC had a significant impact in building the foundation for collaborative work in Chula Vista and pioneering a community-wide initiative focused on obesity prevention in each of the multiple sectors. Some of these efforts included: healthy food initiatives, community gardens, accessibility improvements, and lactation support. Several years after funding from HEAC ended, SDHWC had a strategic opportunity to implement deeper interactions among systems with some of the same, plus additional organizations, with an eye towards scaling up beyond the local community, and building in sustainability from the onset.

Strategies

In order to implement SDHWC activities, the project focused on a West Chula Vista neighborhood of 8,810 people: a primary care site (n=8,000), an elementary school (n=750), and an early childhood education center (n=60). All sites were located within several blocks of each other. Available demographic data characterized the population. See Table 1 for details.

The SDHWC developed key strategies for the year-long process with a mapping exercise to align our work, illustrated in Figure 1. For each strategy, a description of the implementation process, relevant outcomes, sustainability efforts, and lessons learned are described below.

Strategy 1: Build an effective and sustainable collaborative team. Initially, agencies with a history of engagement in the Chula Vista HEAC work were invited to discuss the feasibility of collaboration and participating in the National Healthy Weight Collaborative effort. It was important to represent various sectors of Chula Vista, to include all ages from early childhood to adults, and to have a culturally sensitive approach.

Barriers identified included the lack of funding available for this initiative. Therefore, to be an official member of the SDHWC team, agencies committed resources and agreed to send representatives to participate in monthly meetings and out-of-town learning sessions. Clarity regarding the role of each member in the collaborative developed as the project progressed. New agencies were added when a gap was identified, such as our team's desire to reach the early childhood population. See Box 2 for a list of the final collaborating agencies.

A team leader was identified to organize the team's participation in the Healthy Weight Collaborative Project. A physician from Scripps Family Medicine Residency Program was chosen because of her prior experience with each of the agencies involved, expertise in childhood obesity, and long-term commitment to community-based initiatives in Chula Vista. It has been important for the team building process to have a neutral leader, not perceived to favor one agency's interests over another. One of the first activities was to develop an aim statement, "SDHWC is dedicated to the development and implementation of sustainable community-based strategies to support healthy weight. The team efforts will improve and enhance the systems in South San Diego that promote healthy weight."

Building a cohesive community collaborative team was measured using an evidence-based tool[31] and through qualitative measures during the year-long initiative. The Wilder Collaboration Factors Inventory assessed 20 factors that correlate with collaboration

Table 1.

CHARACTERIZE THE TARGET POPULATION

	Chula Vista Family Clinic	Rice Elementary School	Early Childhood Education Center	West Chula Vista surrounding community
Population at each site (2010)	8,106 unduplicated patients were seen, generating 26,016 total encounters	720 students and 30 staff members	30 children ages 2–5 years old	110,633 residents
Socioeconomic level	86% of patients live at or below 200% Federal Poverty Level and 27% of patients are uninsured	42.5% are classified as English Learners; 71.7% are considered socioeconomically disadvantaged	Families earn less than 70% of the state median income	Median household income is $36,259 18% of families with children are living below poverty line.
Demographics	79% of patients are Latino	82.8% Latino, 6.8% White, 5% African American, 2.1% Asian, 1.7% Filipino	97% Latino and 3% Asian	63% Latino 23%White 6%Asian 4%Black
Obesity Rates	N/A	44% of K–6th grade students were overweight/obese	N/A	N/A

N/A=Not Available

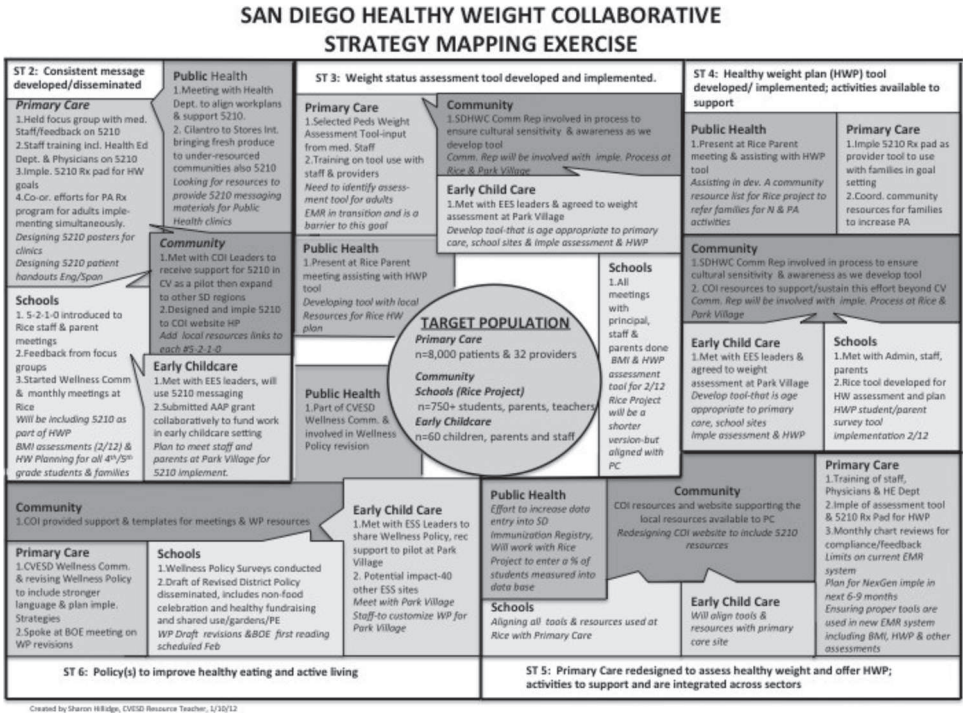

Figure 1. Strategy Mapping Exercise
ST = Strategy; Med = medical; Incl = included; Health Ed(education) Dept (department); Imple = implement; Rx = prescription; HW = healthy weight; Co-or = coordinate; PA = physical activity; Eng/Span = English/Spanish; Int = Initiative; COI = Childhood Obesity Initiative; CV= Chula Vista; SD = San Diego; HP = home page; EES = Educational Enrichment Systems; AAP = American Academy of Pediatrics; Comm = committee; HWP = healthy weight plan; BMI = Body Mass Index; Peds = pediatric; Med = medical; EMR = electronic medical record; SDHWC = San Diego Healthy Weight Collaborative; Comm Rep = community representative; PC = primary care; dev. = developing; N = nutrition; Coord = coordinate; Rep = representative; Admin = Administrators; HE = health education; NexGen = NextGen electronic health records; % = percentage; rec = request; WP = wellness policy; ESS = Educational Enrichment Systems; PE = physical education; BOE = Board of education; Feb = February; CVESD = Chula Vista Elementary School District

success.[32] This tool was administered anonymously to each team member at three intervals throughout the year to include baseline, mid-term, and final results. The goal was to sustain a score of 80+. Table 2 illustrates the team average score by topic, based on a scale of 1–5 and the trends presented by the inventory. The tool supported the team to improve communication and collaboration through analysis of strengths and weaknesses.

Sustainability. The SDHWC learned to build in sustainability by including organizations with an established track record in obesity prevention efforts in San Diego. Despite limited financial support and/or compensation to partner agencies, the commitment to the project has continued beyond the initial one-year focus on the target population. As we expand the strategies to more San Diego communities, each organization has continued to dedicate resources to the healthy messaging campaign and to integrate the message into their own organization. There is less work in silos and more integration

Box 2.

COLLABORATING AGENCIES

American Academy of Pediatrics, California Chapter 3
Chula Vista Community Collaborative
Chula Vista Elementary School District
Community Health Improvement Partners
Health & Human Services Agency-South Region, San Diego Public Health Department
San Diego County Childhood Obesity Initiative
San Ysidro Health Center
Scripps Family Medicine Residency Program
Scripps Mercy Hospital San Diego Border Area Health Education Center
University of California at San Diego Division of Child Development and Community Health
University of California at San Diego, Network for a Healthy California
YMCA Childcare Resource Service

Table 2.

WILDER COLLABORATION FACTOR INVENTORY RESULTS

Team assessment question	Baseline average score	Midterm average score	Final average score
Mutual respect, understanding and trust	4.44	4.33	4.36
Appropriate cross section of members	4.25	4.44	4.14
Ability to compromise	4.00	3.89	4.14
Members share a stake in both process and outcome	4.42	4.33	4.38
Development of clear roles and policy guidelines	3.44	4.44	4.07
Open and frequent communication	4.38	4.71	4.71
Established informal relationships and communication links	4.25	4.69	4.50
Concrete, attainable goals and objectives	3.42	4.33	4.52
Shared vision	4.13	4.44	4.29
Unique purpose	3.88	4.44	4.50
Skilled Leadership	4.50	4.75	4.71
Total Score (mean all items)	4.01	4.27	4.39
Sum of Scores	80	86	84

Box 3.
LESSONS FROM STRATEGY 1

Building an Effective and Sustainable Collaborative Team.

Build in sustainability from the beginning.
Align work plans of individual agencies with the collaborative effort.
Identify a leader: characteristics—trusted, objective, neutral, experienced.
Include a community representative (promotora) on the team.
Individual agencies commit to providing resources (personnel, time, finances, office supplies) to the collaborative.
Meet in person on a regular basis, ongoing communication between scheduled meetings.
Track multi-sector activities from the beginning (data base, meeting minutes).
Form sub-groups to focus on areas of interest: i.e. research, school wellness, grant writing.
Use the Wilder's Collaboration Factors Inventory to measure team strengths and weaknesses, provide anonymous feedback.
Write an aim statement to focus everyone on a common goal.
Identify a target population and describe the community with available data.
Identify key strategies and develop a strategic map with implementation plans specific for each strategy.
Identify what data the collaborative will collect to measure outcomes.

and overlap since the SDHWC began. For example, new funding has been secured to continue collaborative work at a new school site in the district. Additionally, the body mass index (BMI) measurements collected by the school district will be collaboratively evaluated longitudinally. Regular meetings provided a forum to exchange information, review funding opportunities, and provide updates from partner organizations.

Lessons learned. There are many lessons learned that may be helpful to other teams early in the process of collaborative work to address obesity. See Box 3 for a summary of lessons learned. Challenges were overcome that allowed us to apply for funding streams as a team instead of competitively. Team meetings improved communication to avoided misunderstandings between partners. A similar process of team building may be applicable in other communities.

Strategy 2: Disseminate a healthy weight message across multiple sectors in our target population. Initial review of the literature identified successful messaging strategies in other communities.[33–37] A 5210 message was selected because, it promotes evidence-based healthy behaviors; five or more fruits and vegetables per day, two hours or less recreational screen time, one hour or more of physical activity, and zero sugary drinks, more water and low-fat milk. Customizing available 5210 material minimized the cost of creating promotional items.

The SDHWC implementation began with focus groups to test the 5210 message at three sites in the target region. With this input, each site determined how to proceed.

The primary care clinic placed bilingual 5210 health education materials, posters, and prescription pads in all exam rooms. The elementary school site embraced the 5210 message with wellness events and classroom sessions focused on 5210. Students reported; "I like that 5210 are my new house rules and my family is doing it" and "I like that 5210 is easy to remember and I can do it every day". The early childhood education center exhibited 5210 posters, held a 5210 wellness event, and provided 5210 community resources for families.

The SDHWC's goal was to reach 50% of the target population with the 5210 message. In depth assessment of the 5210 message penetration in the community would have required more resources than were available. However, we estimated 50% of the target population was reached with our 5210 messaging campaign using a variety of methods including follow-up meetings, chart reviews, and 30 interviews of patients, parents and staff.

Staff wellness emerged as an unexpected process outcome at all three sites. Wellness role models championed the 5210 message by joining wellness committees, sharing recipes, starting yoga classes and bringing healthier snacks to share at work.

Sustainability. Reaching beyond our target population and sustaining the 5210 message occurred through a variety of efforts. Extensive press coverage expanded the 5210 message to include a countywide initiative with County Supervisor, Mayoral and City Council endorsements. The San Diego County Childhood Obesity Initiative website included 5210 resources accessible to residents countywide in English and Spanish.[38] Chula Vista Elementary School District included the 5210 message in the new district wellness policy brochure and the district website.[39] Public health team members adapted the 5210 message into the work plan for the County of San Diego's 10-year strategy for the reduction of chronic disease in the region called, *Live Well, San Diego!* YMCA Childcare Resource Service incorporated 5210 messaging into all health and wellness trainings and materials for the 39 early childhood education centers they support. YMCA adapted their Healthy Eating Physical Activity Policy for Child Care to match 5210 messaging, and a newsletter article describing the 5210 message was distributed to over 9,000 parents, providers and community members.

Lessons learned. The process of selecting and developing a healthy message for our community helped to unite the different organizations in SDHWC. Consensus to choose the 5210 message and develop work plans were done for each sector. An obstacle we faced was how to fairly credit all partners on the 5210 materials we developed. Some documents had as many as 17 logos and others had the logos of the agencies that paid production costs. High demand for the 5210 materials was another obstacle and several team members supported this need with staff time, translation, and printing. See Box 4 for a summary of lessons learned.

Strategy 3: Assess weight status and implement healthy weight plan across multiple sectors. Implementation of weight assessments and healthy weight plans in the primary care site began with staff focus groups to review current practice guidelines related to childhood obesity prevention, screening, and treatment. Quality Improvement (QI) goals and implementation strategies were discussed. The electronic health record (EHR) used by the clinic lacked the flexibility to change templates and limited efforts to easily incorporate healthy behaviors assessment into clinical practice. The clinic staff

Box 4.
LESSONS FROM STRATEGY 2

Disseminate a healthy weight message across multiple sectors.

Review evidence based messaging materials already available.
Consider language and culture when developing the message.
Pilot the message at different community locations using focus groups.
Implement the message on a small scale to test it.
Disseminate the message across multiple sectors: school, child care, health care, business, government.
The message needs to reach policy level for greater impact.
Media coverage is critical to disseminate the message.
Credit all partners on materials created by the collaborative.

suggested using the "Staying Healthy" Assessment[40] from the California Department of Health Care Services rather than introducing a new tool. Already a requirement for well child exams, this form included several questions relating to the 5210 message.

For each change idea discussed above, the Plan-Do-Study-Act (PDSA) cycle was implemented.[41,42] Examples of the PDSA process included:

- Identify community resources for easy access during clinic.
- Create laminated BMI% color charts for visual aid to discuss BMI with families.
- Train medical assistants to document the BMI% during well child exams over age two years.
- Develop a prescription pad to give to families with their 5210 healthy weight plan.

Changes were tested on a small scale to evaluate their impact before incorporating the change on a larger scale. Family Medicine residents conducted over 400 chart reviews during the year-long project, looking at the primary care performance measures for pediatrics and adults. Table 3 shows the QI goals and outcomes. While the project fell short of the National Quality Forum Measure (NQF)[43,44] goals, further data analysis is more encouraging. At baseline, 20% of adult charts reviewed had health assessment documentation but at the end of the year-long project, this increased to 90%. In the pediatric charts reviewed, we observed a similar increase from 40% of charts with assessments at baseline to 90% by the end of the project.

In preparation for a similar intervention in the community, a number of evidence-based questionnaires were reviewed from the literature to assess healthy eating and physical activity behaviors.[45–49] We adapted the 5210 Healthy Habits Questionnaire[50] and included BMI percentiles. The adapted questionnaire was piloted with community representatives to ensure cultural and linguistic accuracy.

At the elementary school site, the adapted 5210 healthy habits questionnaire was completed by 170 fourth and fifth graders. At the early childhood education center, 30 staff and parents participated.

Table 3.

PRIMARY CARE PERFORMANCE MEASURE OUTCOMES FOR PEDIATRIC AND ADULT CHART REVIEW

Quality Improvement Measure	Goal	Baseline monthly percentage	End of year monthly percentage	Average measurement
NQF 0024 Requires a weight assessment with BMI% as well as counseling for nutrition and counseling for physical activity during the previous 12 months for children age 2–19 years old.	75% of charts reviewed[a] n=200	30%	50%	41%
NQF 0421 requires adults to have a calculated BMI documented in the past six months. If the most recent BMI is outside parameters, then a follow-up plan needs to be documented.	60% of charts reviewed[b] n=200	60%	70%	50%

[a]Chart review of 20 per month for a total of 200 pediatric charts at the end of the initiative
[b]Chart review of 20 per month for a total of 200 adult charts at the end of the initiative
NQF=National Quality Forum
BMI=Body Mass Index

Goals were achieved for Strategy 3 to reach 25% of the target population to assess weight status and 10% to complete a healthy weight plan as demonstrated in Table 4. Obesity rates we measured at each site are in Table 5 and reflect higher rates as compared to available data from the district and county.

Sustainability. Involving resident physicians in SDHWC has helped to ensure that young physicians begin their career with the knowledge, attitude and skills to be part of an integrated QI approach involving the entire clinical team in a PDSA cycle and simultaneously advocating outside the clinic walls for community change.[15]

At the other two sites, healthy weight assessments provided additional data to characterize the population. The project unexpectedly triggered additional wellness activities, including establishing monthly wellness committee meetings to support the new district wellness policy, and weekly healthy recipe exchanges.

Lessons learned. Even though weight assessments are part of routine care in the primary care office, it was a challenge to reach national standards to document the BMI, health assessments, and plans for both children and adults. A barrier to success was the

Table 4.

OUTCOME DATA FOR WEIGHT ASSESSMENT AND HEALTHY WEIGHT PLAN

Target Population	Percentage with a Weight Status Assessment and HWP % (N)
Clinic Patients n=8000	35% (2850)
Elementary School Students n=750	23% (172)
Early Childhood Center n=60	50% (30)
Total reached in all n=8810	35% (3052)

HWP=Healthy Weight Plan

Table 5.

OBESITY MEASUREMENTS IN TARGET POPULATION

Target Population Measured	Percentage with BMI or BMI% Overweight or Obese Range
Clinic Patient Visits (n=200 adult charts)	70% (144/200)
Elementary School Students (n=170 5th graders)	51% (85/170)
Early Childhood Center (n=34 adults/children)	73% (25/34)

BMI=Body Mass Index

need for continuous staff training due to turn over and resident graduation. Efforts to redesign clinical care delivery were hampered by the active transition to a new EHR. The PDSA process of training, discussing goals as a team, and resident involvement in their own chart reviews had the greatest impact on improving quality indicators.

Implementing weight assessments and plans in the school was not difficult in the classroom setting; however we found it to be challenging to accomplish with parents in the setting of a school fair. The data collected at all three sites were instrumental in securing additional funding for our collaborative and driving policy changes in several organizations. See Box 5 for summary of lessons learned.

Strategy 4: Implement policy changes to support healthy eating and physical activity. This strategy focuses on creating a community environment that enables healthy eating and active living in our target population. Members of SDHWC participated in numerous CVESD wellness committee meetings to support the process of revising the district wellness policy.

Box 5.
LESSONS FROM STRATEGY 3

Assess weight status and implement healthy weight plan across multiple sectors.

Select evidence based assessment tool and healthy weight plan.
Assessment tool needs to include body mass index and health behavior questions.
Adapt assessment tool: age, population, culture, electronic health records.
Develop implementation strategies using PDSA model for improvement.
Implement assessment across multiple sectors: schools, primary care and early child care setting.
Analyze results and compare to data already available.
Share findings with key stakeholders, staff, parents, community organizations.
Initial interventions often lead to unexpected outcomes: e.g., formation of wellness committee, staff wellness activities, healthy fundraising initiatives.

PDSA= Plan-Do-Study-Act

Through system wide engagement; SDHWC advocated for stronger policy language to improve nutritional and physical activity requirements, and stricter food rules for celebrations and fundraising, throughout the 44 district schools. The SDHWC focused work at Rice Elementary was instrumental in supporting the district-wide wellness efforts through the testing of wellness changes in small and incremental PDSA cycles that identified strategies, as well as barriers that may assist with implementation of the district wellness policy.

Sustainability. In 2010 and again in 2012, the CVESD measured over 25,000 preschool through 6th grade students across the district. Through the SDHWC collaborative, the public health department is working closely with CVESD to analyze, report, and potentially place BMI surveillance data into the San Diego Regional Immunization Registry. The success of this collaboration may encourage other districts to support more school-based BMI measurement in the future. The district recently contracted with the County of San Diego Health and Human Services Agency as a school partner in Community Transformation Grant activities funded by Center for Disease Control and Prevention. The SDHWC will be assisting CVESD in achieving their four-year goals to increase physical education and physical activities in 19 target schools.

Lessons learned. Reaching beyond the confines of school district stakeholders to integrate efforts across sectors multiplied the effectiveness and implementation success of the district wellness policy. The SDHWC did not initially set a goal to influence policy changes at the YMCA, yet change occurred as a result of the collaborative work with the early childhood education center and 5210 messaging.

Partners were engaged in testing ideas in the field, measuring data when possible, and participating alongside multiple sectors; all contributed to results that were not initially expected. See Box 6 for summary of lessons learned implementing this strategy.

Box 6.
LESSONS FROM STRATEGY 4

Implement policy changes to support healthy eating and physical activity.

Include multiple sectors in the process to support and develop school district wellness policy.
Test elements of the wellness policy in small steps (i.e., one school).
Link the district wellness policy with community wide activities, e.g., 5210 messaging.
Collaborative involvement expands impact of wellness policy e.g., other districts in county adapting similar, stricter wellness policy.
Media coverage helps disseminate information to the community.

Discussion

This project describes a collaborative that includes primary care, public health, schools, and community organizations working with parents and children in a target population. The process and outcomes have potential for expanding obesity prevention efforts on a broader scale. Successes included the ability to measure short term and intermediate outcomes and share lessons learned so that other communities could replicate the process. We acknowledge that our individual team members have considerable experience in their expertise area, but many communities possess similar skill sets. Team members agreed that working jointly together on each strategy resulted in mutual learning. Implementing a health messaging campaign as a team maximized our limited resources and broadened our reach farther than any individual organization could have done alone. Primary care physicians working closely in the schools at classroom and policy levels, promoted a greater commitment to quality improvement efforts.

Overall, our experience is an example of building a systems approach that is much more than simply a multi-sector or multi-level approach. While a coordinated system wide response to the obesity epidemic is essential, more exploratory studies such as ours are needed to demonstrate the full impact these efforts could have, especially in underserved communities. Outcomes must be collected from multiple points including primary care, public health, and community to better understand how multiple sectors can develop new and meaningful interactions that impact individuals and families in a specific community.

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Abbreviations

BMI	Body Mass Index
CVESD	Chula Vista Elementary School District
EHR	Electronic Health Records
HEAC	Health Eating Active Communities
HRSA	Health Resources and Services Administration
NICHQ	National Initiative for Children's Healthcare Quality
PDSA	Plan-Do-Study-Act
QI	Quality Improvement
SDHWC	San Diego Healthy Weight Collaborative

Notes

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