



**COLORADO HEALTHY PEOPLE 2010 INITIATIVE: OBESITY PREVENTION**  
*Additional summary report is available from The Colorado Trust.*

**Evaluation Report**

August 2007

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National Research Center, Inc. would like to acknowledge the contributions of the Colorado Healthy People 2010 Obesity Prevention grantees and especially the Regional Coordinating Agency leaders:

- Jane Viste, MPH; Fort Collins Area United Way, Inc. (Region 1)
- Patricia Berndt, RN; Southeastern Colorado Area Health Education Center (Region 5)

Thanks also go to the following individuals who served as expert panelists for this report:

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- Jennifer Anderson, PhD, RD; Colorado State University Department of Food Science and Human Nutrition
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- Jacqueline Brown, RN, MSN; Prowers County Public Health Nursing Service
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With special thanks to Deborah Main, PhD; University of Colorado Health Science Center, Colorado Health Outcomes Program, who not only served as an expert panelist, but also assisted with the design of the program staff interview protocols and collected the program staff data.

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## **Introduction and Description of the Evaluation**

The United States inadvertently has become “a successful obesity promotion program,” as one international expert on obesity has said.<sup>1</sup> Experts agree that our increasingly sedentary behavior and unhealthful diets are the unintended consequences of complex societal changes, including technology dependence, transportation choices, access to energy-dense food, family structure, employment trends and more. Although by some measures Colorado is the most fit state in the nation, more than one-half of the state’s adult population is estimated to be obese or overweight,<sup>2</sup> and 20% of the state’s youth are estimated to be overweight or at high-risk for obesity.<sup>3</sup> Furthermore, Type 2 Diabetes and other co-morbidities associated with obesity such as hypertension, high cholesterol, coronary heart disease and stroke also continue to increase in prevalence in both adult and youth populations in the U.S.<sup>4</sup>

The obesity pandemic has given rise to a significant number of interventions aimed at reducing obesity and overweight, many focusing on increased physical activity or dietary modifications. A number of the published interventions have shown moderate success at short-term weight loss with an average loss of about 1 pound per week while in treatment.<sup>5,6</sup> Despite satisfactory short-term results of many weight loss programs, the longer-term consequences of the interventions have been disappointing. Most participants who lose weight eventually regain most or all of the weight lost.<sup>7-10</sup>

Many factors contribute to successful weight loss, increased physical activity and improved nutrition, including the physical and social environments of communities and organizations, the policies, practices and norms within social and work settings, and access to information. These multiple levels of influence are referred to as the socio-ecologic model.<sup>11</sup> Research relating to the determinants of obesity has primarily focused on individual-level characteristics<sup>12</sup> while less examination has been made of the community characteristics that correlate with sustained weight loss, increased physical activity and improved nutrition.

### **The Colorado Healthy People 2010 Initiative**

Healthy People 2010 (HP2010) is a statement of national health objectives, providing a framework for prevention efforts in the U.S. It identifies the most significant preventable threats to health and establishes national goals to reduce these threats.<sup>13</sup>

The Colorado Trust established its Colorado Healthy People 2010 Initiative (the Initiative) to “help Coloradans learn about and take steps to lead healthier, longer lives, and to decrease health disparities among different populations.”<sup>14</sup> The Initiative was designed “to help people in the state achieve the objectives of the national [Healthy People 2010] program, while addressing local priorities.”<sup>14</sup> The Colorado Trust chose 5 regional coordinating agencies and 43 community organizations to carry out the work of this Initiative.<sup>14</sup> This evaluation focused on Regions 1 and 5.

In Region 1 (northwest Colorado), the focus of the Initiative was increasing physical activity and in Region 5 it was preventing diabetes (southeast Colorado). Tables 1 and 2 list the grantees for these regions with summary information on the programs they provided.

Table 1 Brief Overview of Colorado Healthy People 2010 Initiative Programs: Region 1 (Northwest Colorado: Focus on Increasing Physical Activity)

Agency	Program	Primary geographic area(s)	Setting	Type of population	Estimated number served	Key activities
Girl Scouts-Mountain Prairie Council Girl Scouts-Chipeta Council	Girl Scouts on the Move	Larimer, Moffatt, Routt, Rio Blanc, Garfield, Pitkin, Eagle counties	Group meetings	Female youth, ages 5-17	1,812	Pedometer, nutrition awareness, new physical activity opportunities
Partners of Larimer County	FIRM (Fitness and Increased Recreation through Mentoring)	Larimer County	One-on-one and group activities	Youth, ages 8-17	30	New physical activity opportunities, nutrition classes
Colorado State University (CSU) Cooperative Extension - Larimer Fort Collins Family Medicine Residency Program Cottonwood Family Practice	Rx Health: Walking Program	Larimer County	Varied	Medical patients and other adults	701	Pedometer, exercise groups, physician recruitment for participant referrals
	Rx Health: Nutrition Classes	Larimer and Eagle counties	Varied	Medical patients and other adults		Nutrition classes
Health District of Northern Larimer County	Health District on the Move	Larimer County	Worksite	Employed adults	4,997	Pedometer, worksite coordinators, newsletter tips
Rocky Mountain Youth Corps	Summer Program	Statewide	Backcountry	Youth, ages 16-24	622	Physical outdoor labor, nutritious meals
	Mentoring Program	Routt County	School-based	Youth, ages 11-14	562	After-school physical activity programs, nutrition programs
Consortium for Older Adult Wellness	Active Choices	Garfield and Eagle counties	Congregate meal sites	Seniors	68	Risk screening, pedometer, peer buddy system, nutrition classes
Moffat County Healthy People	Moffat County on the Move: Walking	Moffat County	Community-wide	Adults	476	Pedometer
	Moffat County on the Move: Dog-Walking	Moffat County	Community-wide	Adults		Pedometer, intra-city competition
	Craig Middle School: The Fitness Club	Craig	School-based	Middle school youth		Expanded PE classes
	Healthy Eating on \$5 per day	Moffat County	Extension office	Low-income adults		Nutrition and food shopping classes
Full Circle of Lake County, Inc.	Extreme Teens	Lake County	School-based	Middle school youth	59	Outdoor physical activity, team building; after-school, summer and weekend
Estes Park Salud Family Health Center Estes Park Salud Family Foundation	Estes Park on the Move: Steps	Estes Park	Community-wide	Adults	260	Health screenings, pedometer, newspaper tips
	Estes Park on the Move: Dog-Walking	Estes Park	Community-wide	Adults		Pedometer, intra-city competition

Table 2 Brief Overview of Colorado Healthy People 2010 Initiative Programs: Region 5 (Southeast Colorado: Focus on Diabetes Prevention)

Agency	Program	Primary geographic area(s)	Setting	Type of population	Estimated number served	Key activities
Parkview Medical Center, Inc.	Diabetes Prevention Program (DPP)	Pueblo County	School-based	Adults at-risk for diabetes	900	Pedometers, health fairs, school wide activities, lifestyle coaches, peer support groups
CSU Cooperative Extension – Fort Collins and Lamar	Healthy, Wealthy & Wise	Prowers, Bent and Otero counties	Varied	Adults	167	Diabetes risk screening, pedometer, 1:1 counseling and wellness classes based on DPP
St. Mary-Corwin Health Foundation	Intensive Diabetes Prevention Program (DPP)	Pueblo	Hospital-based	Adults at-risk for diabetes	184	Diabetes risk screening, pedometer, nutrition counseling
Cheyenne County Public Health	10K 5-A-Day	Cheyenne and Kiowa counties	School-based, senior centers, worksite	Students, seniors, working adults	303	Pedometers, wellness programs, nutrition education, newspaper tips; for students: free weekly healthy snacks
CSU-Pueblo (University of Southern Colorado)	Workplace Wellness	Pueblo area	Worksite	Working adults	264	On-site assessment, wellness classes
Penrose-St. Francis Health Learning Center	Live Well	El Paso County		Adults at-risk for diabetes	307	Health screenings, risk reduction classes, newsletter tips
Bent County Nursing Service	DARE (Diabetes Awareness Reduces Excuses)	Bent County	Varied, but not school-based	Adults and youth	300	Risk assessment, nutrition classes, exercise programs
Teller County Public Health	Learn Early Intervention and Prevention (LEIP)	Teller County	School-based	Sixth grade youth	120	Risk assessment, nutrition classes, exercise programs
	Workplace Wellness	Teller County	Worksite	Adult employees at large company	112	Risk assessment, nutrition classes, exercise programs

## The Obesity Prevention Evaluation

National Research Center, Inc. (NRC) was chosen by The Colorado Trust to conduct the evaluation of its Colorado Healthy People 2010 Initiative across the 2 regions focusing on increasing physical activity and preventing diabetes. This evaluation was designed to answer the following questions:

- 1) Do participants of relevant programs achieve sustained change in terms of dietary and physical activity behavior?
- 2) What community, programmatic and individual characteristics act as facilitators and barriers to sustainable behavior changes?

A variety of tools were developed to collect the information necessary to answer the evaluation questions. The data for the first question about Initiative outcomes came from surveys of participants. For the second question, 3 levels of data about factors which help and hinder behavior change were collected using qualitative and quantitative methods. These 3 levels represent the different levels of the socio-ecologic model (individual, program and community). Individual-level factors were collected via the participant surveys and participant focus groups. Program-level factors were collected through interviews with program staff and a document review of program materials such as progress reports. Community-level factors were gathered from secondary data sources, local government information and special assessments. An expert panel was assembled by NRC to assist in developing the evaluation plan and provide feedback on issues related to data collection and analysis. Figure 1 depicts the design of the evaluation, while additional details are given in the next sections.

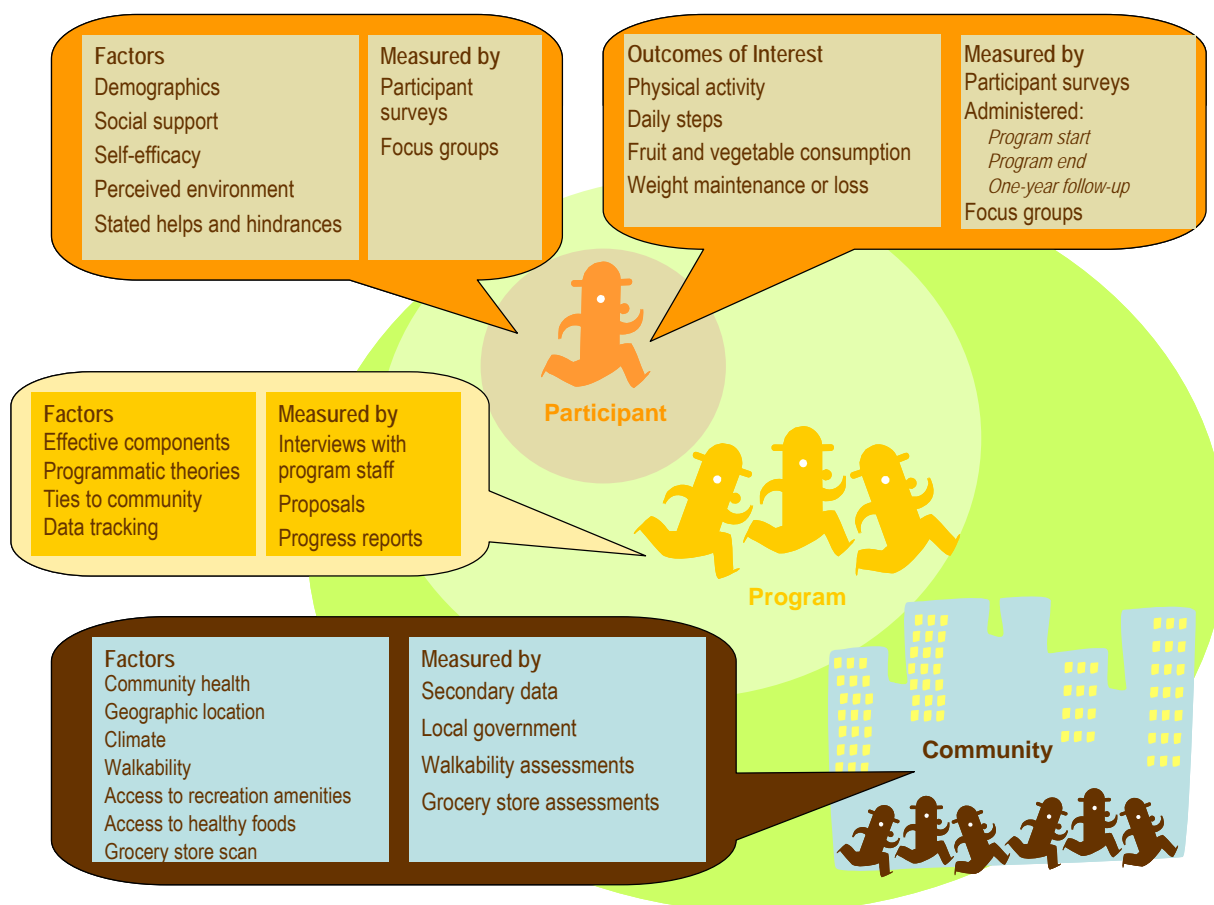


Figure 1 Brief Overview of the Evaluation Design

## Collection of the Data

### *Design and Administration of the Participant Surveys*

Once the grants were awarded in Regions 1 and 5, NRC reviewed the proposals of the programs to be included in the Initiative and constructed an inventory of grantee goals and methodologies. As seen in Tables 1 and 2, a wide variety of interventions were implemented. Although there was significant variation in grantee goals and services, it was determined that the common core behavioral outcomes that could be measured were physical activity, daily steps (for interventions that included a pedometer component), diet and nutrition, weight loss and weight maintenance. In selecting the tools to measure these outcomes, several criteria were used: they had to measure behavior, not knowledge or attitude; be sensitive enough to measure the expected changes in participant behaviors over relatively short periods of time (12-14 weeks); be reliable and valid; be able to be measured 1 year after programs ended; and place a minimal burden on grantees and their participants.

Given the above criteria, self-administered questionnaires were chosen as the most appropriate data collection method. These questionnaires were to be completed by participants when they started a program, at the end of the program and 1 year after program conclusion. The questionnaire was comprised of several question sets designed to measure the outcomes of participant interest as well as participant characteristics that were hypothesized to influence behavior change.

To measure the physical activity outcome, adult participant surveys included the questions from the International Physical Activity Questionnaire (IPAQ).<sup>15</sup> IPAQ was developed by a large consortium of countries to advance physical activity surveillance throughout the world. It was tested in 12 countries (14 sites during 2000) and found by a group of 8 European countries to be the most advanced physical activity measurement tool.<sup>16</sup> Further, the Centers for Disease Control and Prevention (CDC) recommended the tool to measure outcomes in a community evaluation.<sup>17</sup> IPAQ is almost identical to the Behavioral Risk Factor Surveillance Survey (BRFSS) question set on physical activity, but instead of using a “usual” timeframe, it uses “in the last 7 days,” a method shown to be more sensitive and accurate. Because of the similarity to BRFSS, the state surveillance data which was collected using BRFSS, was compared with the evaluation data and HP2010 objectives. The physical activity questions for youth participants came from the Youth Risk Behavior Survey (YRBS).<sup>18</sup> These questions had been tested with youth participants and also allowed direct comparison to state surveillance data. The YRBS also used the “in the last 7 days” wording.

If pedometers were part of a program’s intervention, a step-counter survey was included on which respondents were asked to record the number of steps they made in a day. These data were used to measure the steps outcome.

To assess diet or nutrition, it was determined that increasing fruit and vegetable consumption was a common program goal, and one for which there were HP2010 objectives and available surveillance data. The question set from the YRBS<sup>18</sup> was chosen to assess fruit and vegetable consumption in the surveys for both adults and youth. As with physical activity, the YRBS fruit and vegetable consumption questions used the “in the last 7 days” time frame, but were otherwise quite similar to the BRFSS fruit and vegetable question set, allowing comparisons to HP2010 objectives and statewide trend data.



Finally, a measure of the respondent's weight was included. Using the questions as worded on the YRBS,<sup>18</sup> participants were asked to report their height and weight, from which body mass index (BMI) could be calculated.

The questionnaire was reviewed with grantee program staff. They were given the option of not including question sets related to outcomes on which they were not focusing, but were encouraged to allow inclusion of all the question sets. In almost every case, all programs agreed to include the physical activity, and fruit and vegetable question sets. Some programs, particularly those serving youth, requested that the BMI questions not be included, as it was part of the programs' philosophy to not concentrate on weight and it was felt this question would be detrimental to program goals.

In addition to items used to measure the behavioral outcomes, questions about respondent characteristics were included; these were mostly demographic, such as age, race or ethnicity, employment status and distance to work or school, but also included an item on perceived health status as well as readiness to change questions from the Transtheoretical Model.<sup>19</sup> The question about participants' readiness to change their exercise patterns came from the Cancer Prevention Research Center,<sup>20</sup> on which the nutrition question was then modeled. The question set on readiness to change weight loss also came from the Cancer Prevention Research Center.<sup>21</sup>

Questions to measure other individual-level factors that might influence making and sustaining behavior change were included on the participant survey. Based on examination of the literature, the focus was narrowed to 4 main psychosocial groups of determinants of dietary and physical activity as summarized by De Bourdeaudhuij and Sallis: 1) self-efficacy, 2) perceived benefits, 3) perceived barriers and 4) social variables (social norms, modeling and social support).<sup>22</sup> The following question sets were added to the participant surveys:

- Social support (asked of adults and youth); adapted from Heart Healthy Friend and Family Support for Eating Habits and Exercise Scales<sup>23</sup>
- Self-efficacy for physical activity (asked of adults only); adapted from the Neighborhood Quality of Life Survey (NQLS)<sup>24</sup>
- Perceived risk due to diagnosis of disease of self or close others (asked of adults only); questions created by NRC
- Qualitative assessment of helps and hindrances (asked of adults and youth); open-ended questions created by NRC
- Perceived neighborhood environment: ease of walking in the neighborhood (asked of adults only); adapted from the NQLS<sup>24</sup>
- Perceived access to places to do physical activity or obtain produce (asked of adults only); adapted from the NQLS<sup>24</sup>
- Ease of obtaining fruits and vegetables (asked of adults and youth); question created by NRC.

In order to protect participant confidentiality, participants were asked to follow a replicable process to create an identifier (ID) to record on their survey form. Instructions for this ID were included on the survey form at each administration. For adults, the survey ID consisted of the first 3 letters of their mother's maiden name, or first name, if the maiden name was unknown, plus the day of the month of the participant's birth. For youth, the ID consisted of their first and last initial and the day of the month of their birth. At program start, respondents were asked to complete a consent form before filling out the questionnaire. For youth participants under age 18, the consent form needed to be signed by a parent or legal guardian. In addition, participants were

asked to complete a contact form with their name, address and phone number, so they could be contacted for follow-up surveys. Upon receipt of this information, NRC staff separated contact and consent forms from the questionnaires. Respondent contact information was entered into a database to allow survey tracking, but could not be linked to survey responses.

In all cases, program staff gave eligible participants the program start surveys, consent forms and contact forms. In some cases, they also collected the completed forms and then forwarded them to NRC for data entry and analysis. In other cases, they gave a packet to the participant to take home and fill out on their own. This packet included a postage-paid business reply envelope in which the participant could send the completed materials. In addition to completing the questionnaire, respondents were also asked to complete a contact form. In some cases, program staff also administered a survey at program end. In other cases, NRC mailed a program end survey to participants at the appropriate time interval. In all cases, NRC mailed a program follow-up survey 1 year after program completion to those participants who had completed a program end survey. Evaluation respondents were given incentives for their participation. These varied from program to program, but in most cases were the equivalent of \$10 at program start, \$10 at program end and \$25 at follow-up. External institutional review board (IRB) review was performed of the participant survey administration. As necessary, inter-IRB agreements were reached at those sites that had their own IRB.

A total of 17 sites had 1 or more programs eligible for participation in the evaluation. (An additional site worked only with pre-school children and thus could not be included in the evaluation as the self-administered questionnaire was not appropriate for this age group.) Some of the activities conducted by programs were not appropriate for the evaluation; for example, if a program distributed flyers at a health fair or did health screenings in schools or worksites with no other intervention, these activities were not considered appropriate for the evaluation.

Approximately 12,600 participants were served at the 17 sites that were eligible for the evaluation. Not all eligible participants were included in the evaluation. Given the large number of participants some sites were planning to serve, a sampling scheme was developed to reduce the data collection burden on these programs, so that not all participants were given the opportunity to be in the evaluation. As the evaluation was implemented after programs had begun their interventions, some participants were unable to be included in the evaluation as they had already been exposed to the programs influence. In addition, at some multi-program sites, some programs which otherwise would have been eligible for the evaluation were not included due to communication or coordination issues. At 1 site, the program coordinator believed the obesity prevention evaluation materials were part of the program administration procedures, but due to a miscommunication with program staff, they never were included.

A total of approximately 2,900 program participants (about 23%) from 16 of the 17 sites were given the opportunity to be in the evaluation. Of these participants, 1,427 completed a program-start survey for a response rate of 51%. Of these 1,427 participants, 929 (63%) completed a program-end survey. Those who did not complete a survey may have dropped out of the program and therefore were ineligible to complete a survey, or they may have chosen to discontinue their involvement in the evaluation. Of those completing a program-end survey, 519 completed a 1 year follow-up survey. This represents 56% of those who did a program-end survey and 35% of those who completed a program-start survey.

The surveys were entered into an electronic dataset for analysis using the Statistical Package for the Social Sciences® (SPSS). To be included in the analysis, a survey from program start, end

and follow-up needed to be linked by the ID. Of the 929 program-end surveys, 766 (82%) were able to be linked to a program-start survey. Of the 519 follow-up surveys, 395 (76%) were able to be linked to a program-start and a program-end survey. These 395 participants represent 27% of the 1,492 participants who completed a program-start survey and 14% of the approximately 2,900 program participants given an opportunity to be in the evaluation. There are several reasons that start, end and follow-up data could not be linked: a participant may not have put the same ID on each survey, the ID may have been entered incorrectly or a program-end or follow-up survey may have been received from participants who never completed a program-start survey. The 395 participants came from 14 of the original 17 sites.

A non-completer follow-up survey was created for those participants who did a program-start survey, but did not do a program-end survey. This survey was identical to the follow-up survey other participants received, except that it included a question asking whether the respondent had completed the program in which they had been involved. Approximately 500 of these surveys were sent to participants about 1 year after their program would have ended. A total of 316 of these surveys were completed and returned, for a response rate of 63%. Among those who returned the non-completer follow-up survey, 63% said they had completed the program in which they had been enrolled. Of the 316 returned surveys, 205 (65%) were able to be matched to a program-start survey.

In examining the characteristics of evaluation participants who had only completed a program-start survey to those who had done a program-start and -end survey, or who had completed a survey at all 3 time frames, few differences were observed (see *Appendices*). Adult males were less likely to have completed a follow-up survey than were adult female participants. Among youth, Hispanic youth were less likely to have completed an end or follow-up survey than were Anglo youth. Youth who were seniors in high school or 17 to 18 years old when they began a program were less likely to have completed an end or follow-up survey than were younger youth. Participants who had a higher readiness to change score for fruit and vegetable consumption were more likely to have completed a program-end and follow-up survey than participants who were lower on the readiness to change score. Participants who scored higher on the weight loss readiness to change scale were more likely to have completed end and follow-up surveys than those who scored lower on this scale. Little difference in measured healthy behaviors at program start was observed between participants who completed the evaluation (end and follow-up surveys) and those who did not.

### ***Design and Administration of the Participant Focus Groups***

Between July 2005 and August 2006, 16 one-and-one-half hour focus groups were held in 8 geographic regions, with representation from 9 different programs. A total of 127 program participants' voices were heard in these groups. All discussions were digitally audio-recorded and transcribed. In 2005, questions focused on program characteristics as well as individual-level helps and hindrances. In 2006, questions delved more deeply into individual-, program- and community-level helps and hindrances.

Focus group attendees were recruited from among all respondents who had completed program start surveys. The telephone recruitment script screened based on whether participants had completed the program (those who had not were classified as "non-completers") and whether they felt they had made a change in either fruit and vegetable consumption or physical activity (with those who self-reported they had made a change classified as "successful completers" and the others as "less successful completers").

When there were enough people, focus groups were divided into successful completers, less successful completers and non-completers. Because of the constraints of time and numbers of interested participants, less successful completers and non-completers were combined in the first set of groups in 2005. In the second set of groups, conducted in 2006, the recruited individuals who were interested and available to attend the sessions were primarily successful completers.

In 2005, NRC contacted potential focus group attendees via telephone only, using a prepared recruitment script. In 2006, potential attendees were first sent a letter notifying them that they might be called to participate in a focus group. The invitation letter described the focus group process. Within 2 weeks, potential participants were called to see if they could attend one of a few pre-scheduled groups. For 1 group in 2006, phone calls were unnecessary, as enough people called in response to the invitation to fill the groups.

The groups were scheduled after work and school hours, at either a central hotel location (in urban areas) or a college or library facility (in more rural areas). Usually, participants were given a choice of times. Youth that agreed to participate were sent a consent form ahead of time so they could bring the signed form with them to the focus group. On the day prior to the meeting, participants were called again to confirm attendance, location, directions and to answer any remaining questions.

A professional facilitator and a scribe equipped with a digital tape recorder attended each focus group. Each group was served healthful refreshments or dinner, depending upon the time. Upon entering, each participant was welcomed by the facilitator or scribe and given a place to sit at the table with a table tent namecard. Participants were encouraged to eat before, during or after the discussion. The facilitator began with an explanatory preamble, then called upon each person to say their name and respond to a relevant ice breaker designed to build rapport and comfort in the group. Thereafter, discussion was structured via questions and participants spoke at will rather than in turn. At the end of the session, usually about an hour and a half, participants were thanked and given a monetary gift.

### ***Design and Administration of the Program Staff Interviews***

Two sets of interviews were conducted with program staff. The first interview instrument and protocol was developed by an outside consultant from Colorado Health Outcomes (CoHO). The interview script was designed to elicit information in a conversational, qualitative manner about factors believed to be effective in promoting positive behavior change.<sup>25-28</sup>

Program staff were initially contacted by an NRC staff member, who explained the purpose of the interview and scheduled the appointment. Before the appointment, program staff members completed consent forms and sent them to NRC. The interviews were conducted with program staff from all 17 sites in July and August 2005 by an evaluator from CoHO. These interviews were digitally audio-recorded and transcribed. External IRB review was performed before the protocols were implemented.

A second interview with program staff was conducted approximately 1 year after the grants had ended. This interview script focused on program sustainability after funding had ceased and was developed jointly by NRC and CoHO. In August and September 2006, 15 program staff were interviewed by the same CoHO evaluator. These interviews were also digitally audio-recorded and transcribed.

### ***Design and Administration of the Community Profile***

A variety of factors such as “walkability” (presence of sidewalks, streetlights, walking or biking trails and so on), recreational and physical activity center availability and accessibility, social norming, presence of policies facilitating or hindering physical activity, public awareness campaigns for change in physical activities and weather have been found to be associated with physical activity levels, or were hypothesized by the evaluation team to be associated.<sup>22, 29-39</sup>

Community indicators such as the availability and accessibility of healthy foods, the presence of diet centers and weight loss clinics, policies facilitating or hindering nutrition or health and public awareness campaigns for change in nutrition have been found to be associated with healthy nutrition behaviors, or were hypothesized by the evaluation team to be associated.<sup>25, 40, 41</sup>

To capture information about these community-level factors, several tools were crafted to facilitate creation of a community profile: a form on which to record data from secondary sources (such as the U.S. Census, BRFSS, yellow pages and the Internet), a form to collect information from local government staff members about specific policies and infrastructure provided by the entity, a grocery store assessment to determine the availability of fruits and vegetables, and a walkability assessment.

The data collection form for secondary data was pilot-tested by NRC staff members using it to record the information for Boulder, Colorado, the community in which NRC’s office is located, but which is not in either of the regions included in the evaluation.

The tool used to collect local government information had several variations, with the appropriate one to be used depending on the size of the community. For small communities, a single staff member was able to complete all the questions, while for other communities it was necessary that staff members from different departments or divisions (e.g., Transportation, Parks and Recreation, Planning) be contacted. The tool was pilot-tested with the City of Boulder municipality. NRC began contacting municipal and county staff by phone. Depending on the preference of the staff members contacted, the data were collected over the phone or hard copies were faxed to the staff member to complete and return via fax; however, it was found to be very difficult to gain cooperation and to get the forms completed. The forms were simplified and the protocols revised to an in-person visit by evaluation staff to local government offices. This proved to be a more effective methodology to obtain the desired information. It also could be accomplished during the same community visits when the walkability and grocery store assessments were performed.

The walkability assessment was adapted from the Walkability Audit Tool created by the Centers for Disease Control and Prevention (CDC).<sup>33, 42</sup> This tool was pilot-tested within Boulder neighborhoods. Although a variety of grocery store assessments were examined, none measured directly the availability of produce, so an assessment was created by NRC. This assessment was pilot-tested at grocery stores within Boulder. Visits to the communities within Regions 1 and 5 of the Initiative were conducted from September through November 2005.

## Analysis of the Data

### *Measurement of the Outcomes*

While programs were encouraged to allow all the outcomes to be measured, only where the outcome was a focus of the program were the outcomes used. All programs targeted physical activity to at least a “medium” degree (see Appendix VII: Program Descriptions), thus all the data collected on physical activity were included. If a program included a pedometer the assumption was that steps were a focus and thus all the steps data were included. Fruit and vegetable consumption, however, was not a focus of some program, or was only targeted to a “low” degree. Fruit and vegetable consumption data from participants in these programs were not included in the analyses in this report, except for the analysis comparing outcomes by the degree to which they were targeted by programs (see Table 118). As obesity is theoretically linked to all these behaviors, BMI was analyzed for all adult participants. Youth participants were excluded because several of the youth-serving programs requested that BMI data not be collected, resulting in relatively few cases for analysis. Also, BMI classification for youth often requires different calculations than those for adults.

### Adult Physical Activity

Respondents were asked on how many of the last 7 days they had engaged in moderate or vigorous activity. If the response was 1 or more days, they were then asked about how long they had usually been active on those days. Moderate physical activity was measured as the number of days of 30 or more minutes of moderate physical activity. Vigorous physical activity was measured as the number of days of 20 or more minutes of vigorous physical activity. These 2 variables were summed to calculate the number of days of moderate or vigorous physical activity.

### Youth Physical Activity

Respondents were asked on how many of the last 7 days they had engaged in moderate activity lasting 30 or more minutes. In addition, they were asked on how many of the last 7 days they had engaged in 20 or more minutes of vigorous activity. These 2 variables were summed to calculate the number of days of moderate or vigorous physical activity.

### Fruit and Vegetable Consumption

Respondents were asked how often they had consumed various fruit and vegetable products in the last 7 days. The categories from which they could choose a response were assigned a number of servings per week, as shown below:

I did not [consume any] during the past 7 days .....	0 servings
1 to 3 times during the past 7 days.....	2 servings
4 to 6 times during the past 7 days.....	5 servings
1 time per day.....	7 servings
2 times per day .....	14 servings
3 times per day .....	21 servings
4 or more times per day .....	28 servings

To calculate the approximate number of fruits consumed per week, the answers to 2 questions were summed:

- The number of 100% fruit juices consumed in the last 7 days
- The number of fruits consumed in the last 7 days.

To calculate the approximate number of vegetables consumed per week, the answers to 4 questions were summed:

- The number of potatoes consumed in the last 7 days
- The number of times green salads consumed in the last 7 days
- The number of times carrots consumed in the last 7 days
- The number of times other vegetables consumed in the last 7 days.

To calculate the approximate number of fruits and vegetables consumed per week, the number of fruits and the number of vegetables consumed per week were summed.

### Daily Steps

Steps were reported as the total number recorded on the assigned day.

### Body Mass Index (BMI)

Two questions were used to calculate BMI: weight in pounds and height in feet and inches. Height was converted to total inches and the formula below was used to calculate BMI:<sup>43</sup>

$$\text{BMI} = \left( \frac{\text{Weight in Pounds}}{(\text{Height in inches})^2} \right) \times 703$$

Using this calculation of BMI, the following Centers for Disease Control and Prevention (CDC) guidelines were used to classify adult respondents as underweight, normal weight, overweight and obese:

Below 18.5 .....	Underweight
18.5 to 24.9 .....	Normal
25.0 to 29.9 .....	Overweight
30.0 and above .....	Obese

### ***Measurement of the Individual-level Factors***

The individual-level factors were derived from the participant survey data. The calculation of these factors is shown in Table 3.

Table 3 Measurement of the Individual-level Factors

Factor	Measurement
Self-reported Health Status (Possible Range 1 to 5)	Would you say your health is... 5=Excellent, 4=Very Good, 3=Good, 2=Fair, 1=Poor
Perceived Personal Risk (Possible Range 0 to 3)	Sum of yes responses: In the last two years, have you been told that you have one of the following conditions? heart disease, diabetes, cancer
Perceived Family Member Risk (Possible Range 0 to 3)	Sum of yes responses: In the last two years, has one of your family members been told that they have one of the following conditions? heart disease, diabetes, cancer
Perceived Friend Risk (Possible Range 0 to 3)	Sum of yes responses: In the last two years, has one of your close friends been told that they have one of the following conditions? heart disease, diabetes, cancer
Perceived Total Risk (Possible Range 0 to 9)	Sum of above 3 scales
Family Social Support for Physical Activity (Possible Range 1 to 5)	Average of items: During the past three months, how often did your family do each of the following? Did physical activity with me Offered to do physical activity with me Gave me encouragement to do physical activity Changed their schedule so we could do physical activity together Gave me helpful reminders to do physical activity (1=never, 2=rarely, 3=sometimes, 4=often, 5=very often)
Friend Social Support for Physical Activity (Possible Range 1 to 5)	Average of items: During the last three months, how often did your friends do each of the following? Did physical activity with me Offered to do physical activity with me Gave me encouragement to do physical activity Changed their schedule so we could do physical activity together Gave me helpful reminders to do physical activity (1=never, 2=rarely, 3=sometimes, 4=often, 5=very often)
Family Social Support for Fruit and Vegetable Consumption (Possible Range 1 to 5)	Average of items: During the past three months, how often did your family do each of the following? Encouraged me to eat fruits and vegetables Discussed my eating habits with me Reminded me to eat fruits and vegetables Offered me fruits and vegetables when I visit in their homes (1=never, 2=rarely, 3=sometimes, 4=often, 5=very often)
Friend Social Support for Fruit and Vegetable Consumption (Possible Range 1 to 5)	Average of items: During the last three months, how often did your friends do each of the following? Encouraged me to eat fruits and vegetables Discussed my eating habits with me Reminded me to eat fruits and vegetables Offered me fruits and vegetables when I visit in their homes (1=never, 2=rarely, 3=sometimes, 4=often, 5=very often)



Factor	Measurement	
Self-Efficacy for Physical Activity (Possible Range 1 to 5)	<p>Average of items: For each item, please mark how sure you are that you could perform physical activity in that situation.</p> <ul style="list-style-type: none"> <li>Engage in physical activity even though I am feeling sad or highly stressed</li> <li>Stick to my physical activity program even when family or social life takes a lot of time</li> <li>Set aside time for regular physical activity</li> </ul> <p>1=I'm sure I cannot, 3=Maybe I can, 5=I'm sure I can</p>	
Physical Activity Readiness to Change (Possible Range 1 to 5)	<p>Regular exercise is any planned physical activity (e.g., brisk walking, aerobics, jogging, bicycling, swimming, rowing, etc.) performed to increase physical fitness. Such activity should be performed 3 to 5 times per week for 20-60 minutes per session. Exercise does not have to be painful to be effective but should be done at a level that increases your breathing rate and causes you to break a sweat.</p> <p>Do you exercise regularly according to that definition?</p> <p>Yes, I have been for MORE than 6 months: Stage=Maintenance =5  Yes, I have been for LESS than 6 months: Stage=Action=4  No, but I intend to in the next 30 days: Stage=Preparation=3  No, but I intend to in the next 6 months: Stage=Contemplation =2  No, and I do NOT intend to in the next 6 months: Stage=Precontemplation=1</p>	
Fruit & Vegetable Readiness to Change (Possible Range 1 to 5)	<p>Do you regularly eat 5 or more fruits and vegetables a day?</p> <p>Yes, I have been for MORE than 6 months: Stage=Maintenance =5  Yes, I have been for LESS than 6 months: Stage=Action=4  No, but I intend to in the next 30 days: Stage=Preparation=3  No, but I intend to in the next 6 months: Stage=Contemplation =2  No, and I do NOT intend to in the next 6 months: Stage=Precontemplation=1</p>	
Weight Loss Maintenance Readiness to Change (Possible Range 1 to 4)	Maintenance=4	<ul style="list-style-type: none"> <li>• In the past month, have you been actively trying to lose weight? .....yes or don't need to</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>• In the past month, have you been actively trying to keep from gaining weight? .....yes or don't need to</li> </ul> <p>AND:</p> <ul style="list-style-type: none"> <li>• Have you maintained your desired weight for more than 6 months? .....yes or don't need to</li> </ul>
	Action=3	<ul style="list-style-type: none"> <li>• In the past month, have you been actively trying to lose weight? .....yes or don't need to</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>• In the past month, have you been actively trying to keep from gaining weight? .....yes or don't need to</li> </ul> <p>AND:</p> <ul style="list-style-type: none"> <li>• Have you maintained your desired weight for more than 6 months? .....no</li> </ul>
	Contemplation=2	<ul style="list-style-type: none"> <li>• In the past month, have you been actively trying to lose weight? .....no</li> </ul> <p>AND</p> <ul style="list-style-type: none"> <li>• In the past month, have you been actively trying to keep from gaining weight? .....no</li> </ul> <p>AND</p> <ul style="list-style-type: none"> <li>• Are you seriously considering trying to lose weight to reach your goal in the next 6 months? .....yes</li> </ul>
	Precontemplation=1	<ul style="list-style-type: none"> <li>• In the past month, have you been actively trying to lose weight? .....no</li> </ul> <p>AND</p> <ul style="list-style-type: none"> <li>• In the past month, have you been actively trying to keep from gaining weight? .....no</li> </ul> <p>AND</p> <ul style="list-style-type: none"> <li>• Are you seriously considering trying to lose weight to reach your goal in the next 6 months? .....no</li> </ul>

### ***Measurement of the Program-level Factors***

Using data collected through the open-ended interview conducted with 1 or more staff members from each agency or coalition funded and examination of the grantee proposals and progress reports, program-level factors were coded by NRC staff and the evaluator from CoHO.

Program-level indices were created by summarizing several factors, as shown in Table 4.

Table 4 Measurement of the Program-level Factors

Factor	Measurement
Ties to Community Index (1=most positive, 0=most negative)	Average of items Program setting is representative of other similar settings in the community (1=yes, 0=no) Program staff is similar to population they serve (1=yes, 0=no) Program collaborates with other community programs in planning or delivering programs or services (1=yes, 0=no)
Reach to Intended Population Index (1=most positive, 0=most negative)	Average of items Target population is representative of community (1=yes, 0=no) Program reaches intended target – participation rates (1=>75%, 0<75%) Program participants are similar to target population (1=yes, 0=no) Recruitment strategies (1=active, 0=passive) Program acceptance (1=high, 0=low) Target population is representative of community (1=yes, 0=no)
Data Tracking Index (1=most positive, 0=most negative)	Average of items: Extent of program drop-out (0=>75%, 1<75%) Delivered program tracks program dropouts (1=yes, 0=no) Delivered program follows up with program drop-outs (1=yes, 0=no) Project collects information on program participants (1=yes, 0=no) Project collects information on program dropouts (1=yes, 0=no) Project collects information on behavior change (1=yes, 0=no) Project collects information to improve program (1=yes, 0=no) What percentage of participants completed most (80%) of program (0=>75%, 1<75%)
Tailoring Program for Participants Index (1=4 types, 0=no type of tailoring)	Average of item: Tailored by readiness to change (1=yes, 0=no) Tailored by mode preference (1=yes, 0=no) Tailored by risk factors (1=yes, 0=no) Tailored by individual (1=yes, 0=no)

### ***Measurement of the Community-level Factors***

A number of community-level factors were examined. Participants' perception of their community environment was measured through participant surveys. These factors are shown in Table 5.

Table 5 Measurement of the Community-level Factors

Factor	Measurement
<p>Perceived Neighborhood Environment (Possible Range 1 to 4)</p>	<p>Average of items: Please check the box for the answer that best applies to you and your neighborhood.</p> <ul style="list-style-type: none"> <li>There are many places to go within easy walking distance of my home.</li> <li>It is easy to walk to places within my neighborhood. (The streets, sidewalks or paths connect to other places.)</li> <li>There are sidewalks on most of the streets in my neighborhood.</li> <li>The sidewalks in my neighborhood are well maintained (paved, even, and not a lot of cracks).</li> <li>There are bicycle or pedestrian trails in or near my neighborhood that are easy to get to.</li> <li>My neighborhood is pleasant to look at while walking; it is clean, and/or there are trees, views, and/or attractive buildings.</li> <li>It is safe to walk in or near my neighborhood.</li> <li>My neighborhood streets are well lit at night.</li> </ul> <p>1=strongly disagree, 2=somewhat disagree, 3=somewhat agree, 4=strongly agree</p> <ul style="list-style-type: none"> <li>There is so much traffic along the streets in my neighborhood that it makes it difficult or unpleasant to walk.</li> <li>The streets in my neighborhood are hilly or it is otherwise difficult to walk in my neighborhood.</li> <li>The crime rate in my neighborhood makes it unsafe to go on walks during the day.</li> <li>The crime rate in my neighborhood makes it unsafe to go on walks at night.</li> </ul> <p>4=strongly disagree, 3=somewhat disagree, 2=somewhat agree, 1=strongly agree</p>
<p>Perceived Access to Good Nutrition (Possible Range 0 to 6)</p>	<p>Sum of items Please indicate whether each of these types of places are on a frequently traveled route (e.g., to and from work) or within a 5-minute drive or 10-minute walk from your work or home.</p> <ul style="list-style-type: none"> <li>a grocery store (yes=1)</li> <li>a natural food store (e.g., Wild Oats, Whole Foods, Alfalfa's) (yes=1)</li> <li>a farmer's market (seasonal or year-round) (yes=1)</li> <li>a fast food restaurant (no=1)</li> <li>an all-you-can-eat buffet (no=1)</li> <li>a convenience store (e.g., 7-11, gas station store) (no=1)</li> </ul>
<p>Perceived Access to Physical Activity (Possible Range 0 to 3)</p>	<p>Sum of items Please indicate whether each of these types of places are on a frequently traveled route (e.g., to and from work) or within a 5-minute drive or 10-minute walk from your work or home.</p> <ul style="list-style-type: none"> <li>health club/gym/aerobics studio or public recreation center (yes=1)</li> <li>walking/running/hiking trails (yes=1)</li> <li>biking trails (yes=1)</li> </ul>
<p>Perceived Access to Fruits &amp; Vegetables (Possible Range 1 to 4)</p>	<p>How easy or difficult is it for you to get fresh produce (fruits and vegetables)? 1=very difficult, 2=somewhat difficult, 3=somewhat easy, 4=very easy</p>

The walkability assessment was comprised of the following elements and a score calculated as shown in Table 6.

Table 6 Measurement of Walkability

Element	Calculation of Score
<p>A. Pedestrian Facilities (High Importance): Presence of a suitable facility, such as a walking path or sidewalk. 1=No facility – pedestrians walk on road or dirt path. 3=Paved walkway on one side of road, minor discontinuities that present modest barrier to walking. 5=Continuous paved walkway on both sides of road or completely separated from roadway.</p>	<p>Sum of "High Importance" Factors (A, F, G) x 3 + Sum of "Medium Importance" Factors (B-E, H) x 2 + Sum of "Low Importance" Factor (I) x 1  Then divided by 100</p>
<p>B. Maintenance (Medium Importance): Buckling pavement, overgrown vegetation, standing water, etc. 1=Major or frequent problems 3= Occasional 5=No problems</p>	
<p>C. Path Size (Medium Importance): Adequate functional width, taking into account factors such as utility poles and signs within pathway. 1=No walking path or sidewalk 3=Narrow path (&lt;4' width) 5=Wide path (&gt;4' functional width)</p>	
<p>D. Buffer (Medium Importance): Space separating path from adjacent roadway. 1=No buffers from roadway or pedestrians walk in roadway. 3=Moderate buffer (3' from traffic) 5=Not adjacent to roadway</p>	
<p>E. Universal Access (Medium Importance): Ease of access for mobility impaired people. Includes ramps for wheelchairs, handrails along steps, etc. 1=Completely impassible to people with impairments. 3=Inaccessible, or inconvenient (e.g., greater travel distance) 5=Fully accessible and convenient</p>	
<p>F. Pedestrian Conflicts (High Importance): Potential for conflict with motor vehicle traffic due to: driveways, high speed and volume traffic, large intersections, poor pedestrian visibility, etc. 1=High conflict potential 5=Low conflict potential</p>	
<p>G. Crosswalks (High Importance): Presence and visibility of crosswalks at intersecting roads. Traffic signals have functional 'walk' lights that provide sufficient crossing time. 1=Crosswalks not present despite large intersections. 5=No intersections, or crosswalks are clearly marked</p>	
<p>H. Aesthetics (Medium Importance): Attractive facilities and conditions create a place that people enjoy. 1=Uninviting 3=Pleasant neighborhood 5=Very attractive, beautiful neighborhood or in park setting</p>	
<p>I. Shade/Covering (Low Importance): Amount of shade and rain cover. 1=No cover 3=Moderate cover 5=Full cover</p>	

Table 7 shows the indices created from questions asked of local government staff members.

Table 7 Measurement of Additional Community-level Factors

Factor from Local Government Survey	Calculation of Score
Presence of ordinances/policies promoting healthy lifestyles (0=none, 100=most)	<p>Average of following items (yes=100) Please indicate if any of the following are present in your community.</p> <ul style="list-style-type: none"> <li>Non-smoking ordinance</li> <li>Ordinances or codes stipulating the type of street lighting necessary to improve safety along streets and paths through uniformly lit streets and paths</li> <li>Codes or plans stipulating pedestrian connections between residential developments or subdivisions, and destinations such as schools, parks, retail, transit and employment (“network plans”)</li> <li>Codes for new developments that promote safe street crossing including crosswalks, presence of a raised median or refuge island, traffic lights, pedestrian crossing signals</li> <li>Programs, plans or funding for public improvements that promote safe street crossing including crosswalks, presence of a raised median or refuge island, traffic lights, pedestrian crossing signals</li> <li>Policies promoting non-motorized transportation</li> <li>Mixed land use policies or plans for at least some mixed land use projects, such as locating appropriate businesses and public services in or adjacent to residential areas (shops, schools, workplaces, parks)</li> <li>Incentives for walk- or bike-to work programs for own employees.</li> <li>Incentives for walk- or bike-to work programs for employees within the jurisdiction</li> <li>Higher taxes or pricing for high calorie food items</li> </ul>
Presence of active health promotion in the community (0=none, 100=most)	<p>Average of following items (yes=100) Please indicate which, if any, of the following are present in your community.</p> <ul style="list-style-type: none"> <li>Signs, literature, point of purchase information promoting fresh fruit and vegetable consumption</li> <li>Media campaigns promoting the importance of eating fresh fruits and vegetables</li> <li>Education programs promoting fresh fruit and vegetable consumption</li> <li>An individual in your community who is known for facilitating change in your community in the areas of physical activity and nutrition</li> </ul>
Presence of barriers to outdoor physical activity (0=none, 100=most)	<p>Average of following items (yes=100) Please indicate whether any of the following might keep an individual from walking, biking or engaging in other physical activities outdoors for longer than a week at a time.</p> <ul style="list-style-type: none"> <li>Extreme wind</li> <li>Extreme cold</li> <li>Bad air quality</li> <li>Other</li> </ul>

## ***Statistical Procedures***

### **Descriptive Statistics**

For many of the variables of interest, descriptive statistics, including frequencies, means and standard deviations, are shown in the body of the report or in the appendices.

### **Behavioral Outcomes**

To test for change within participants from program start to program end, or from program start to follow-up, 2 types of comparisons were made for each outcome of interest. When changes in the proportion of respondents meeting HP2010 goals or other health objectives were examined, McNemar's test for correlated proportions-normal theory test or McNemar's test for correlated proportions-exact test was used to test whether differences were significant. When changes in the average levels of these outcome variables were examined, dependent t-tests were used.

### **Associations of Outcomes With Factors That Might Influence Behavior Change**

The structure of the dataset is complex, as participants are cross-nested. Even when examining individual-level factors, it is necessary to account for the fact that participants were nested within programs. Thus, associations with the factors examined were tested by linear mixed modeling which adjusted for nesting of participants within programs or communities. As the change in the outcomes of interest was the dependent variable in these models, the start level of the outcome was included as an adjustment factor, except when examining whether the start level of the outcome was associated with changes in the outcome over time. In addition, the models included whether or not the participant was an adult or youth (except when the outcome or the factor was only measured in 1 of the groups) and the respondents' gender.

## ***Qualitative Analysis***

All focus group discussions were digitally audio-recorded, then professionally transcribed. Transcriptions and some field notes from the on-site scribes were coded and analyzed using NUD\*IST software. The focus group data were combined with the survey verbatim data for analysis. Emergent themes that addressed the research questions were coded and quantified. Representative quotes were pulled from the transcripts and verbatims for this report.

The telephone interviews conducted with program leaders were digitally audio-recorded and transcribed. Transcriptions were then coded and analyzed using NUD\*IST software. Each question was analyzed independently. All responses to closed-ended questions were quantified, while open-ended responses were analyzed for emergent themes.

## **Study Limitations**

Several methodological limitations of the research should be considered when interpreting these results. First, the self-report nature of the instruments meant that the data had the potential to be limited by social desirability bias (i.e., the tendency to respond to questions in a manner that is socially acceptable or preferred). For example, people tend to under-report behaviors of which others might disapprove, such as unhealthy or culturally insensitive behavior. In the case of the behavioral data in this study, social desirability bias might result in participants reporting higher levels of physical activity, fruit and vegetable consumption or lower weights. Although efforts were made to reduce participant bias by ensuring confidentiality and relying on questions that had been previously validated and were used in large-national studies (e.g., BRFSS, YRBS, IPAQ), desirable responses may have been overestimated and undesirable responses

underestimated. However, if such biases were present at all 3 time frames the survey was administered, the effect of the bias on the behavioral change estimates (the key outcomes in this study) would be minimal because responses would be shifted positively at all 3 intervals.

Second, selection bias may have influenced the results due to the fact that participants were not placed in programs at random, but chose to enroll. The type of participant who was interested in participating may have different outcomes than those who never thought to participate. Those who chose to begin a program, but then discontinued their participation may be different than those who persisted in a program to its conclusion. Those who chose to participate in the evaluation by completing the questionnaires may differ from those who chose not to be involved in the evaluation. Selection bias is a limitation that most program evaluations contend with and is not unique to the obesity prevention evaluation. The obesity prevention evaluation respondents included in the analyses for this report represented 14% of the program participants given a chance to be a part of the evaluation, thus the ability to extrapolate to general community settings may be limited. However, in examining the characteristics of respondents who only did a program-start survey with those who participated more fully in the evaluation, few differences were found. The baseline levels of the outcomes of interest were similar in those who completed a survey at all 3 time frames to those who completed only a start or a start and end survey.

Third, as with most community-based interventions, finding a like control group is nearly impossible. This study relied on state and national surveillance data to show trends in BMI, physical activity and produce consumption to strengthen the argument that these behavioral changes are attributed to the programs. Surveillance data are limited as a true control because they strive to represent the general population when some of the programs funded in this Initiative involved populations of higher-risk individuals.

Fourth, the evaluation timeframe of a year may not have been sufficient to study sustained behavioral change. While a follow-up of 12 months is longer than many of the published weight-loss studies, it is not the 2 to 5 years often considered as long-term by some behavioral experts.<sup>5,9</sup>

Fifth, the scope of this evaluation, which included examination of the association of individual-, program- and community-level factors with the outcomes of interest, made it difficult to study any single factor thoroughly. To keep respondent burden low, individual-level factors such as self-efficacy and readiness to change were measured with only a couple of questions. Program-level factors were based on nonexhaustive qualitative data collection methods, which are subjective, and community-level factors were based on broad-brush indicators. These indicators were estimates applied to an entire city or county and may not reflect the “true” environment within a specific area of town or neighborhood within a community that might have a more immediate effect on an individual participant. Further, the measurement of true environment is complex because people live, work and go to school in multiple geographic areas which are nested within other environments.<sup>40</sup> This study looked at many factors in a general way; more intensive studies are needed to determine if the relationships hold.

Finally, characteristics of the Initiative, such as the heterogeneity of interventions, geographic locations and target populations did not permit a strong framework to draw conclusions about the causal connections between the community and program characteristics and the outcomes that programs intended to achieve. Nevertheless, this design successfully explored relationships that existed between features of the programs and their intended outcomes.

# Results

## Participant Outcomes

The first evaluation question for this project asked whether participants in the Initiative programs made and sustained behavior change in 4 key areas: physical activity, daily steps, weight loss or maintenance as measured by BMI. The outcomes achieved are summarized in the following sections. Where appropriate, comparisons are made to HP2010 objectives.<sup>44</sup>

### Participant Physical Activity Outcomes

The national HP2010 objectives for adult physical activity are to:

- Reduce the proportion of adults who engage in no leisure-time physical activity (U.S. target 20%).
- Increase the proportion of people aged 18 and over who engage in regular, preferably daily, moderate physical activity for at least 30 minutes per day (U.S. target 30%).
- Increase the proportion of adults who engage in vigorous physical activity that promotes the development and maintenance of cardiorespiratory fitness, 3 or more days per week, for 20 or more minutes per occasion (U.S. target 30%).<sup>44</sup>

As shown in Table 8, the percent of adult participants who reported doing no leisure time physical activity was 35% at program start and 21% by program end, a statistically significant change. However, by 1 year following termination of participation in the program, observed inactivity levels (33%) were similar to those seen at program start. The HP2010 goal is that no more than 20% of adults be physically inactive; statewide, 17% to 19% of adults were seen to be physically inactive during the years 2002 to 2005, demonstrating that a greater proportion of Colorado Healthy People 2010 participants were inactive than the general population when they enrolled in these programs and that inactivity levels among state residents remained relatively unchanged during this time period.

The HP2010 target for the proportion of adults doing moderate physical activity for at least 30 minutes per day on 5 or more days per week is 30%. Among Initiative participants in the evaluation, 23% were meeting or exceeding this recommendation when they enrolled in their program; by program end, 30% were meeting or exceeding this recommendation, a statistically significant increase. By follow-up, the proportion of participants doing moderate physical activity was 27%, which was not statistically significantly different than program-start levels, but seems to indicate that some participants who had made positive change continued to engage in moderate physical activity at recommended levels. About 40% of state residents as reported in BRFSS during the time period of 2002 to 2005 were engaging in moderate physical activity at the levels recommended by HP2010, a greater proportion than that observed among Initiative participants. However, the proportion of Colorado residents engaging in moderate physical activity remained constant during this time period, while some positive change was observed among program participants.

The HP2010 target for the proportion of adults doing vigorous activity for at least 20 minutes per day on 3 days or more per week is 30%. Statewide, about a third (33%) of residents were estimated to regularly take part in vigorous physical activity at these levels during the years 2002 to 2005. Among evaluation participants, 30% were meeting or exceeding this recommendation at program start; by program end, 38% of participants were meeting or exceeding this recommendation, a statistically significant increase and one that is slightly above that observed



in the state. By follow-up, 36% of participants were engaged in the recommended amounts of vigorous physical activity, which was not statistically significantly different than program-start levels, but again, seems to indicate that some participants sustained their positive behavior change in this area, while state residents remained static in their levels of vigorous physical activity over a similar time frame.

Statewide, just over half of adult residents were estimated to be participating in moderate or vigorous physical activity at the recommended levels during the years 2002 to 2005. Among evaluation participants, 42% were engaging in the recommended levels of moderate or vigorous physical activity at program start, while 52% were doing so by program end, a statistically significant increase. By follow-up, this had dropped off somewhat to 48% of participants, a difference that once again was not statistically significantly different from program-start levels, but was in a promising direction while state trends remained flat.

Table 8 Percent of Adult Program Participants Engaging in Recommended Levels of Physical Activity Compared to Reference Data

Physical Activity Outcomes	HP2010 Goal	State Levels (BRFSS) <sup>2</sup>				Percent of Colorado HP2010 Initiative Participants		
		2002	2003	2004	2005	Start	End	Follow-up
Proportion of adults doing no leisure time physical activity	20%	19%	17%	19%	17%	35.3%	21.4% <sup>‡</sup>	32.5%
Proportion of adults who do moderate physical activity for >= 30 min regularly at least 5 times per week	30%	40%	41%	not available	41%	23.2%	30.3%*	26.9%
Proportion of adults who do vigorous physical activity that promotes development and maintenance of cardiorespiratory fitness on >=3 days/week for >= 20 minutes/occasion	30%	33%	33%	not available	33%	30.0%	37.5%*	35.9%
Proportion of adults who do moderate physical activity for >= 30 min regularly at least 5 times per week or vigorous physical activity for >= 20 minutes on >= 3 days per week	50%	53%	55%	not available	54%	42.1%	52.0% <sup>†</sup>	47.7%
Number of participants	---	---	---	---	---	N=323	N=323	N=323

\* $p < 0.05$ ; <sup>†</sup> $p < 0.01$ ; <sup>‡</sup> $p < 0.001$ ; tested using McNemar's test for correlated proportions (change from start to end, or start to follow-up)

The average change in the number of days of moderate or vigorous physical activity was examined. Overall, a small net increase was detected from program start to program end, which was statistically significant. An even smaller net increase was seen from program start to program follow-up, which also was statistically significant (see Tables 9,10 and 11).

Table 9 Change in Days per Week of Moderate Physical Activity of Adult Program Participants

Number of days per week of moderate physical activity lasting 30 or more minutes						
	Start	End	Change	Start	Follow-up	Change
Mean	2.15	2.97	0.82 <sup>‡</sup>	2.15	2.64	0.49 <sup>†</sup>
Standard deviation	2.46	2.60	3.04	2.46	2.63	3.03
95% confidence interval, lower bound	1.88	2.68	0.49	1.88	2.35	0.16
95% confidence interval, upper bound	2.42	3.25	1.15	2.42	2.92	0.82
Number of participants	N=323	N=323	N=323	N=323	N=323	N=323

\* $p<0.05$ ; <sup>†</sup> $p<0.01$ ; <sup>‡</sup> $p<0.001$ ; tested using dependent t-test.

Table 10 Change in Days per Week of Vigorous Physical Activity of Adult Program Participants

Number of days per week of vigorous physical activity lasting 20 or more minutes						
	Start	End	Change	Start	Follow-up	Change
Mean	1.55	1.85	0.30*	1.55	1.92	0.37 <sup>†</sup>
Standard deviation	2.06	2.20	2.60	2.06	2.18	2.43
95% confidence interval, lower bound	1.32	1.61	0.02	1.32	1.68	0.11
95% confidence interval, upper bound	1.77	2.09	0.59	1.77	2.16	0.64
Number of participants	N=323	N=323	N=323	N=323	N=323	N=323

\* $p<0.05$ ; <sup>†</sup> $p<0.01$ ; <sup>‡</sup> $p<0.001$ ; tested using dependent t-test.

Table 11 Change in Days per Week of Moderate or Vigorous Physical Activity of Adult Program Participants

Number of days per week of moderate physical activity lasting 30 or more minutes or vigorous physical activity lasting 20 or more minutes						
	Start	End	Change	Start	Follow-up	Change
Mean	3.70	4.89	1.20 <sup>‡</sup>	3.70	4.49	0.80 <sup>†</sup>
Standard deviation	3.72	3.88	4.37	3.72	4.09	4.47
95% confidence interval, lower bound	3.29	4.47	0.72	3.29	4.04	0.31
95% confidence interval, upper bound	4.10	5.31	1.67	4.10	4.94	1.28
Number of participants	N=323	N=323	N=323	N=323	N=323	N=323

\* $p<0.05$ ; <sup>†</sup> $p<0.01$ ; <sup>‡</sup> $p<0.001$ ; tested using dependent t-test.

The national HP2010 objectives for youth physical activity are to:

- Increase the proportion of adolescents who engage in moderate physical activity for at least 30 minutes on 5 or more of the previous 7 days (U.S. target 35%).
- Increase the proportion of adolescents who engage in vigorous physical activity that promotes cardiorespiratory fitness 3 or more days per week for 20 or more minutes per occasion (U.S. target 85%).<sup>44</sup>

Among the youth participants, an increase from program start (31%) to program end (39%) in the proportion meeting the HP2010 goal for moderate physical activity was seen, but this difference was not statistically significant. By follow-up, levels had dropped to those observed at program start. The proportion engaging in the HP2010 recommended levels of vigorous physical activity remained similar over the evaluation period, although a non-statistically significant increase from about 78% to 87% was seen. When compared to the proportion of adolescents engaging in the recommended amounts of moderate physical activity statewide, a similar proportion of youth evaluation participants were meeting the recommended physical activity levels. Little change was observed from 2003 to 2005 in these proportions statewide. However, for vigorous physical activity, an increase was observed statewide in the proportion engaging in recommended levels, from 64% in 2003 to 70% in 2005. This is still less than the HP2010 target and less than what was observed among evaluation participants, although the estimates for evaluation participants are based on the 71 respondents who completed start, end and follow-up surveys.

Little change was observed in the average number of days of moderate or vigorous physical activity per week among youth participants (see Tables 13, 14 and 15). None of the differences were statistically significant.

Table 12 Percent of Youth Program Participants Engaging in Recommended Levels of Physical Activity Compared to Reference Data

Physical Activity Outcomes	HP2010 Goal	State Levels (YRBSS) <sup>3</sup>		Percent of Colorado HP2010 Initiative Participants		
		2003	2005	Start	End	Follow-up
The proportion of adolescents who do moderate physical activity for >=30 min on >= to 5 of last 7 days	35%	31%	30%	31.0%	39.4%	31.0%
The proportion of adolescents who do vigorous physical activity that promotes development and maintenance of cardiorespiratory fitness on >=3 days/week for >= 20 minutes/occasion	85%	64%	70%	77.5%	78.9%	87.3%
Number of participants	---	---	---	N=71	N=71	N=71

\*p<0.05; †p<0.01; ‡p<0.001; tested using McNemar's test for correlated proportions (change from start to end, or start to follow-up)

Table 13 Change in Days per Week of Moderate Physical Activity of Youth Program Participants

Number of days per week of moderate physical activity lasting 30 or more minutes						
	Start	End	Change	Start	Follow-up	Change
Mean	3.35	3.82	0.46	3.35	3.51	0.15
Standard deviation	2.51	2.16	2.58	2.51	2.04	3.22
95% confidence interval, lower bound	2.77	3.31	-0.15	2.77	3.03	-0.61
95% confidence interval, upper bound	3.94	4.32	1.08	3.94	3.98	0.92
Number of participants	N=71	N=71	N=71	N=71	N=71	N=71

\* $p<0.05$ ; † $p<0.01$ ; ‡ $p<0.001$ ; tested using dependent t-test.

Table 14 Change in Days per Week of Vigorous Physical Activity of Youth Program Participants

Number of days per week of vigorous physical activity lasting 20 or more minutes						
	Start	End	Change	Start	Follow-up	Change
Mean	4.38	4.41	0.03	4.38	4.56	0.18
Standard deviation	2.01	1.95	1.89	2.01	1.70	2.27
95% confidence interval, lower bound	3.91	3.95	-0.42	3.91	4.17	-0.35
95% confidence interval, upper bound	4.85	4.86	0.48	4.85	4.96	0.72
Number of participants	N=71	N=71	N=71	N=71	N=71	N=71

\* $p<0.05$ ; † $p<0.01$ ; ‡ $p<0.001$ ; tested using dependent t-test.

Table 15 Change in Days per Week of Physical Activity of Youth Program Participants

Number of days per week of moderate physical activity lasting 30 or more minutes or vigorous physical activity lasting 20 or more minutes						
	Start	End	Change	Start	Follow-up	Change
Mean	7.73	8.23	0.49	7.73	8.07	0.34
Standard deviation	4.07	3.71	3.59	4.07	3.24	4.74
95% confidence interval, lower bound	6.79	7.36	-0.36	6.79	7.32	-0.79
95% confidence interval, upper bound	8.68	9.09	1.34	8.68	8.82	1.46
Number of participants	N=71	N=71	N=71	N=71	N=71	N=71

\* $p<0.05$ ; † $p<0.01$ ; ‡ $p<0.001$ ; tested using dependent t-test.

## Participant Daily Steps Outcomes

If pedometers were part of a program's intervention (11 of 17 sites), a step-counter survey was included on which respondents were asked to record the number of steps they made in a day which was randomly assigned to them. The number of steps was classified into 2 categories to allow comparison to the health goals of the 10,000 Steps Program sponsored by Shape Up America!<sup>45</sup> As shown in Table 16, 27% of evaluation participants were making 10,000 or more steps per day at program start. By program end, 35% were doing so, a statistically significant increase, and by the 1 year follow-up, 40% of participants were doing so, also a statistically significant increase compared to program-start levels. According to a survey conducted on behalf of Colorado on the Move (now America on the Move) in 2002, about 14% of Colorado residents were estimated to be making 10,000 or more steps per day, levels lower than those observed among evaluation participants in pedometer programs. By program end, over one-third (35%, see Table 17) of evaluation participants had increased their steps by 2,000 or more steps per day

from program start, the amount recommended by the On the Move program,<sup>46</sup> and 41% had done so by follow-up.

The average change in the number of daily steps from program start to program end was 665 steps per day, a statistically significant increase. The average change from program start to follow-up was 1,137 steps per day, also a statistically significant increase (see Table 18).

Table 16 Percent of Program Participants Making Recommended Number of Daily Steps Compared to Reference Data

Daily Steps Outcome	State Levels (Colorado on the Move Step Study, 2002) <sup>47</sup>	Percent of Colorado HP2010 Initiative Participants		
		Start	End	Follow-up
Proportion making at least 10,000 steps a day	14%	26.7%	34.7%*	40.3% <sup>†</sup>
Number of participants	---	N=176	N=176	N=176

\* $p < 0.05$ ; <sup>†</sup> $p < 0.01$ ; <sup>‡</sup> $p < 0.001$ ; tested using McNemar's test for correlated proportions (change from start to end, or start to follow-up)

Table 17 Percent of Participants Increasing Daily Steps by 2,000 or More Steps per Day

Change in Daily Steps	Percent of Colorado HP2010 Initiative Participants	
	Start to End	Start to Follow-up
Increased steps by 2,000 steps or more	35.2%	40.9%
Did not increase steps by 2,000 steps or more	64.8%	59.1%
Number of participants	N=176	N=176

Table 18 Change in Number of Daily Steps of Program Participants

Daily Steps	Start	End	Change	Start	Follow-up	Change
Mean	7,967	8,632	665*	7,967	9,104	1,137*
Standard deviation	4,643	4,412	3,840	4,643	5,074	5,814
95% confidence interval, lower bound	7,281	7,980	94	7,281	8,354	272
95% confidence interval, upper bound	8,653	9,284	1,236	8,653	9,853	2,001
Number of participants	N=176	N=176	N=176	N=176	N=176	N=176

\* $p < 0.05$ ; <sup>†</sup> $p < 0.01$ ; <sup>‡</sup> $p < 0.001$ ; tested using dependent t-test.

### Participant Nutrition (Fruit and Vegetable Consumption) Outcomes

The national HP2010 objectives for fruit and vegetable consumption are to:

- Increase the proportion of persons age 2 years and older who consume at least 2 daily servings of fruit (U.S. target 75%).
- Increase the proportion of persons aged 2 years and older who consume at least 3 daily servings of vegetables, with at least one-third being dark-green or deep-yellow vegetables (U.S. target 50%).<sup>44</sup>

Additionally, it is the recommendation of the National Cancer Institute that Americans eat 5 or more fruits and vegetables per day for better health.<sup>48</sup>

As shown in Table 19, a much lower proportion of participants in the programs in which fruits and vegetables were a focus reported eating the recommended number of fruit and vegetable servings compared to the HP2010 national target rate. Rates for Colorado adult and youth

residents from 2002 to 2005 were also much lower than the national target rate. The HP2010 goal is for 75% of all persons age 2 years and older in the U.S. to eat 2 or more daily servings of fruit; 23% of evaluation participants in programs where fruit and vegetable consumption was a focus were eating 2 or more fruits per day when they began an Initiative program. However, by program end, somewhat more (33%) were consuming 2 or more fruits per day, a statistically significant increase. By follow-up, the proportion of evaluation participants eating 2 or more fruits per day was 29%, a statistically significant higher proportion than at program start. The HP2010 target rate for vegetable consumption is that 50% of the U.S. population consume at least 3 daily vegetable servings. At program start, 17% of participants were doing so; by program end and follow-up, no statistically significant increases were observed. Only 11% of participants were consuming a total of 5 or more fruits and vegetables per day at program start; by program end, 18% were doing so, a statistically significant increase. However, by follow-up, only 15% of evaluation participants were consuming 5 or more daily fruit and vegetable servings, a rate not statistically significantly different from the program-start rate.

Table 19 Percent of Program Participants Eating the Recommended Number of Servings of Fruits and Vegetables Compared to Reference Data

Fruit and Vegetable Outcomes	HP2010 Goal	State Levels (YRBSS) <sup>3</sup>		State Levels (BRFSS) <sup>2</sup>			Percent of Colorado HP2010 Initiative Participants		
		2003	2005	2002	2003	2005	Start	End	Follow-up
Proportion who consume at least 2 daily servings of fruit	75%	not available	not available	19%	19%	20%	22.9%	32.7% <sup>†</sup>	29.3%*
Proportion who consume at least 3 daily servings of vegetables	50%	not available	not available	8%	9%	9%	16.5%	18.8%	21.8%
Proportion eating 5 or more fruits and vegetables per day	---	19%	19%	24%	24%	24%	10.5%	18.0% <sup>†</sup>	15.0%
Number of participants	---	---	---	---	---	---	N=266	N=266	N=266

\* $p < 0.05$ ; <sup>†</sup> $p < 0.01$ ; <sup>‡</sup> $p < 0.001$ ; tested using McNemar's test for correlated proportions (change from start to end, or start to follow-up)

While it is a worthwhile goal to meet the recommended number of daily fruit and vegetable servings, any increase in fruit and vegetable servings is desirable. Tables 20, 21 and 22 show the participants' reports of the average number of fruit servings, vegetable servings and total fruit and vegetable servings consumed per week at program start, end and follow-up in programs where fruit and vegetable consumption were a focus. The average change is also displayed. While the changes observed were small, statistically significant increases were observed from program start to program end for weekly fruit servings, weekly vegetable servings and total fruit and vegetable servings consumed. Changes from program start to follow-up were also statistically significant for all 3 of these outcomes.

Table 20 Change in Number of Fruits Consumed by Program Participants

Number of whole fruit servings per week	Start	End	Change	Start	Follow-up	Change
Mean	6.77	8.58	1.80 <sup>‡</sup>	6.77	7.92	1.14 <sup>†</sup>
Standard deviation	6.29	7.18	6.71	6.29	6.98	6.18
95% confidence interval, lower bound	6.02	7.72	0.99	6.02	7.08	0.40
95% confidence interval, upper bound	7.53	9.44	2.61	7.53	8.76	1.89
Number of participants	N=266	N=266	N=266	N=266	N=266	N=266

\* $p < 0.05$ ; <sup>†</sup> $p < 0.01$ ; <sup>‡</sup> $p < 0.001$ ; tested using dependent t-test.

Table 21 Change in Number of Vegetables Consumed by Program Participants

Number of vegetable servings per week	Start	End	Change	Start	Follow-up	Change
Mean	11.74	12.82	1.08*	11.74	13.12	1.38 <sup>†</sup>
Standard deviation	7.50	7.74	7.08	7.50	8.32	8.06
95% confidence interval, lower bound	10.84	11.89	0.22	10.84	12.12	0.41
95% confidence interval, upper bound	12.64	13.75	1.93	12.64	14.12	2.35
Number of participants	N=266	N=266	N=266	N=266	N=266	N=266

\* $p < 0.05$ ; <sup>†</sup> $p < 0.01$ ; <sup>‡</sup> $p < 0.001$ ; tested using dependent t-test.

Table 22 Change in Number of Fruits and Vegetables Consumed by Program Participants

Number of whole fruit and vegetable servings per week	Start	End	Change	Start	Follow-up	Change
Mean	18.51	21.39	2.88 <sup>‡</sup>	18.51	21.03	2.52 <sup>†</sup>
Standard deviation	11.92	13.18	11.29	11.92	13.10	11.85
95% confidence interval, lower bound	17.08	19.81	1.52	17.08	19.46	1.09
95% confidence interval, upper bound	19.94	22.98	4.25	19.94	22.61	3.95
Number of participants	N=266	N=266	N=266	N=266	N=266	N=266

\* $p < 0.05$ ; <sup>†</sup> $p < 0.01$ ; <sup>‡</sup> $p < 0.001$ ; tested using dependent t-test.

### Participant Weight Loss or Maintenance Outcomes

The national HP2010 objectives for body mass index (BMI) are to:

- Increase the proportion of adults who are at a healthy weight (defined as a BMI equal or greater than 18.5 and less than 25) (U.S. target 60%).
- Reduce the proportion of adults who are obese (defined as a BMI of 30 or more) (U.S. target 15%).<sup>44</sup>

The HP2010 objective is for 60% of American adults to be at a healthy weight. Among Colorado Healthy People 2010 adult participants who completed a 1 year follow-up survey, 42% were at a healthy weight when they began their program, a rate slightly lower than that observed statewide in the years 2002 to 2005. No statistically significant changes were seen in the proportion of adult participants at a healthy weight by program end or program follow-up, although the trend was in a positive direction. The HP2010 goal is for no more than 15% of U.S. adults to be obese; about a quarter of program participants had a BMI of 30 or more at the time they started, a level higher than that seen statewide in the years 2002 to 2005 (between 16% and 18%). No statistically significant changes were observed in the proportion of adult participants classified as obese by program end or follow-up, although the trend was in a positive direction.

Table 23 Percent of Adult Program Participants in Various Categories of BMI Compared to Reference Data

BMI Outcomes	HP2010 Goal	State Levels (BRFSS) <sup>2</sup>				Percent of Colorado HP2010 Initiative Participants		
		2002	2003	2004	2005	Start	End	Follow-up
Proportion of adults who are at a healthy weight (defined as a BMI equal or greater than 18.5 and less than 25)	60%	47%	49%	47%	45%	41.5%	41.8%	45.4%
Proportion of adults who are obese (defined as a BMI of 30 or more)	15%	17%	16%	17%	18%	24.5%	22.7%	21.6%
Number of participants	---	---	---	---	---	N=282	N=282	N=282

\* $p < 0.05$ ; <sup>†</sup> $p < 0.01$ ; <sup>‡</sup> $p < 0.001$ ; tested using McNemar's test for correlated proportions (change from start to end, or start to follow-up)

The change in average BMI from program start to program end was slight, but statistically significant (see Table 24), with participants having dropped from an average BMI of 27.2 at program start to 26.9 at program end. However, by follow-up, the average change in BMI from program start was not statistically significant.

Table 24 Change in Body Mass Index (BMI) Among Adult Program Participants

What is your height in inches? What is your weight in pounds? (Converted to BMI)	Start	End	Change	Start	Follow-up	Change
Mean	27.17	26.90	-0.27 <sup>†</sup>	27.17	26.98	-0.19
Standard deviation	6.01	5.88	1.39	6.01	6.34	2.63
95% confidence interval, lower bound	26.47	26.21	-0.44	26.47	26.24	-0.49
95% confidence interval, upper bound	27.87	27.58	-0.11	27.87	27.72	0.12
Number of participants	N=282	N=282	N=282	N=282	N=282	N=282

\* $p < 0.05$ ; <sup>†</sup> $p < 0.01$ ; <sup>‡</sup> $p < 0.001$ ; tested using dependent t-test.

## Individual-level Factors

Tables 25 and 26 show the relationship between individual-level factors and the outcomes of interest. These analyses were not performed for BMI, as no change was observed among evaluation participants. These analyses were performed using linear mixed modeling to account for the nested structure of the data (individual participants within programs).



Table 25 Association of Individual Characteristics and Start Levels of Outcomes of Interest With Changes in Outcomes of Interest

Individual-level factors		Change in number days per week moderate activity 30+ minutes OR vigorous activity 20+ minutes		Change in daily steps		Change in number whole fruit & vegetable servings per week	
		Start to end	Start to follow-up	Start to end	Start to follow-up	Start to end	Start to follow-up
Was meeting HP2010 objective by engaging in moderate or vigorous physical activity 5 times or more per week at program start (1=yes, 0=no)	$\beta$	-3.53	-4.34	/	/	/	/
	p-value	0.000	0.000	/	/	/	/
	N	N=394	N=394	/	/	/	/
Number of days of moderate or vigorous physical activity at program start	$\beta$	-0.61	-0.67	/	/	/	/
	p-value	0.000	0.000	/	/	/	/
	N	N=394	N=394	/	/	/	/
Was meeting Shape Up America! objective of 10,000 daily steps at program start (1=yes, 0=no)	$\beta$	/	/	-3,764	-6,551	/	/
	p-value	/	/	0.000	0.000	/	/
	N	/	/	N=176	N=176	/	/
Number of daily steps at program start	$\beta$	/	/	0	-1	/	/
	p-value	/	/	0.000	0.000	/	/
	N	/	/	N=176	N=176	/	/
Was meeting National Cancer Institute recommendation to eat 5 fruits or vegetables a day at program start (1=yes, 0=no)	$\beta$	/	/	/	/	-0.13	-0.15
	p-value	/	/	/	/	0.000	0.000
	N	/	/	/	/	N=266	N=266
Fruit and vegetable consumption at program start	$\beta$	/	/	/	/	-0.35	-0.41
	p-value	/	/	/	/	0.000	0.000
	N	/	/	/	/	N=266	N=266
Target group (1=adult, 0=youth)	$\beta$	-1.76	-0.82	-3,057	-2,586	3.59	4.74
	p-value	0.001	0.085	0.013	0.146	0.165	0.074
	N	N=394	N=394	N=176	N=176	N=266	N=266
Gender (1=Female, 0=Male)	$\beta$	-0.15	-0.82	-537	-455	0.26	1.96
	p-value	0.743	0.085	0.497	0.692	0.878	0.259
	N	N=394	N=394	N=176	N=176	N=266	N=266
Race (1=White, 0=Other)	$\beta$	0.26	-0.58	275	860	-1.29	-0.01
	p-value	0.640	0.311	0.804	0.591	0.683	0.998
	N	N=381	N=381	N=170	N=170	N=104	N=104
Ethnicity (1=Non-Hispanic, 0=Hispanic)	$\beta$	0.56	0.62	2,056	2,557	2.58	-7.46
	p-value	0.525	0.508	0.183	0.212	0.761	0.367
	N	N=323	N=323	N=159	N=159	N=57	N=57
Employment status (adults only) (1=employed, 0=not employed)	$\beta$	0.38	0.84	1,989	685	-2.35	-1.91
	p-value	0.434	0.105	0.001	0.394	0.147	0.294
	N	N=316	N=316	N=162	N=162	N=239	N=239

Tested by linear mixed modeling, adjusted for nesting of participants within programs, target participant (youth or adult), gender and the level of the outcome of interest at program start; shading indicates statistical significance of  $p < 0.05$ .

Table 26 Association of Individual-level Factors With Changes in Outcomes of Interest

Individual-level factors		Change in number days per week moderate activity 30+ minutes OR vigorous activity 20+ minutes		Change in daily steps		Change in number whole fruit & vegetable servings per week	
		Start to end	Start to follow-up	Start to end	Start to follow-up	Start to end	Start to follow-up
		Self-reported Health Status (Possible Range 1 to 5, 1=poor, 5=Excellent)	$\beta$	0.56	0.14	760	285
	p-value	0.021	0.588	0.019	0.500	0.100	0.010
	N	N=322	N=322	N=164	N=164	N=245	N=245
Perceived Personal Risk (adults only) (Possible Range 0 to 3, 0=no diagnoses in last 2 years, 3=diagnosis of heart disease, cancer and diabetes)	$\beta$	0.70	1.47	411	2,470	1.91	2.57
	p-value	0.332	0.064	0.675	0.049	0.393	0.355
	N	N=160	N=160	N=90	N=90	N=121	N=121
Perceived Family Member Risk (adults only) (0=no diagnoses in last 2 years, 3=diagnosis of heart disease, cancer and diabetes)	$\beta$	0.37	0.27	-406	793	-0.82	-0.14
	p-value	0.276	0.478	0.329	0.139	0.405	0.909
	N	N=160	N=160	N=90	N=90	N=121	N=121
Perceived Friend Risk (adults only) (0=no diagnoses in last 2 years, 3=diagnosis of heart disease, cancer and diabetes)	$\beta$	-0.03	0.59	-73	-61	0.51	1.13
	p-value	0.944	0.152	0.886	0.926	0.661	0.435
	N	N=160	N=160	N=90	N=90	N=121	N=121
Perceived Total Risk (adults only) (Possible Range 0 to 9, sum of 3 scales above)	$\beta$	0.19	0.42	-217	683	-0.03	0.43
	p-value	0.361	0.072	0.489	0.091	0.957	0.563
	N	N=160	N=160	N=90	N=90	N=121	N=121
Friend Social Support for Physical Activity (Possible Range 1 to 5 (1=never, 5=very often))	$\beta$	0.20	0.19	-396	-336		
	p-value	0.443	0.518	0.313	0.505		
	N	N=180	N=180	N=89	N=89		
Family Social Support for Physical Activity (Possible Range 1 to 5 (1=never, 5=very often))	$\beta$	0.43	0.39	333	558		
	p-value	0.088	0.159	0.397	0.259		
	N	N=175	N=175	N=87	N=87		
Self-Efficacy for Physical Activity (Possible Range 1 to 5 (1='I'm sure I cannot, 5='I'm sure I can'))	$\beta$	0.96	0.63	898	1,130		
	p-value	0.007	0.116	0.095	0.104		
	N	N=160	N=160	N=90	N=90		
Friend Social Support for Fruit & Vegetable Consumption (Possible Range 1 to 5 (1=never, 5=very often))	$\beta$					2.32	0.11
	p-value					0.021	0.924
	N					N=133	N=133
Family Social Support for Fruit & Vegetable Consumption (Possible Range 1 to 5 (1=never, 5=very often))	$\beta$					1.13	-0.64
	p-value					0.130	0.475
	N					N=129	N=129
Physical Activity Readiness to Change (5=maintenance, 1=pre-contemplation)	$\beta$	0.63	0.52	236	90		
	p-value	0.000	0.005	0.310	0.785		
	N	N=383	N=383	N=168	N=168		
Fruit & Vegetable Readiness to Change (5=maintenance, 1=pre-contemplation)	$\beta$					-1.08	0.16
	p-value					0.082	0.802
	N					N=261	N=261

Tested by linear mixed modeling, adjusted for nesting of participants within programs, target participant (youth or adult), gender and the level of the outcome of interest at program start; shading indicates statistical significance of  $p < 0.05$ .

### Change in Outcomes of Interest by Amount of the Program Received

“Dose-response” refers to the relationship between the amount of a treatment or intervention received (dose) and the amount of healthy change observed (response). In general, little association was found between the amount of participation of those involved in the Initiative programs and the amount of change in the outcomes of interest observed (see Table 27). The exception was that among those involved in programs with a focus on fruit and vegetable consumption, a greater average increase in fruit and vegetable consumption from program start to follow-up was observed among those who had participated a greater percent of time in the program than among those who had participated a lesser percent of the time.

Table 27 Association of Individual-level Dose-response Factors with Changes in Outcomes of Interest

Dose-response factors		Change in number days per week moderate activity 30+ minutes OR vigorous activity 20+ minutes		Change in daily steps		Change in number whole fruit & vegetable servings per week	
		Start to end	Start to follow-up	Start to end	Start to follow-up	Start to end	Start to follow-up
		$\beta$					
Percent of weeks participated in the program	$\beta$	0.48	-0.67	568	-1,816	5.24	7.16
	p-value	0.564	0.456	0.742	0.511	0.119	0.049
	N	N=314	N=314	N=141	N=141	N=216	N=216
Percent of weeks participated in the program (1=80% to 100%, 0=less than 80%)	$\beta$	0.68	-0.14	525	-55	2.08	3.56
	p-value	0.161	0.789	0.478	0.963	0.250	0.069
	N	N=314	N=314	N=141	N=141	N=216	N=216
Percent of weeks wore the pedometer	$\beta$	0.55	0.16	1,765	540	0.44	1.31
	p-value	0.480	0.839	0.148	0.778	0.872	0.640
	N	N=258	N=258	N=128	N=128	N=163	N=163
Percent of weeks wore the pedometer (1=80% to 100%, 0=less than 80%)	$\beta$	0.33	-0.08	1,111	92	-0.10	0.94
	p-value	0.486	0.867	0.116	0.934	0.956	0.604
	N	N=258	N=258	N=128	N=128	N=163	N=163
How much participant participated (5=All of the times 4=Almost all of the times (at least 90% of the times) 3=A lot of the times (at least three-quarters of the times) 2=About half of the times 1=A few of the times (less than half of the times))	$\beta$	-0.23	0.03	***	***	1.11	-0.42
	p-value	0.721	0.952	***	***	0.699	0.895
	N	N=28	N=28	***	***	N=18	N=18
How much participant participated (1="most;" 0="not most")	$\beta$	-0.38	0.43	***	***	-8.32	0.41
	p-value	0.865	0.826	***	***	0.392	0.968
	N	N=28	N=28	***	***	N=18	N=18
Intended dose (Number of weeks program was intended to last)	$\beta$	0.01	-0.01	13	110	0.03	-0.01
	p-value	0.580	0.677	0.837	0.295	0.597	0.844
	N	N=385	N=385	N=141	N=141	N=257	N=257
Intended dose multiplied by the percent of weeks participated	$\beta$	-0.03	-0.03	176	295	0.10	0.34
	p-value	0.481	0.520	0.291	0.369	0.479	0.025
	N	N=314	N=314	N=25	N=25	N=216	N=216

*Tested by linear mixed modeling, adjusted for nesting of participants within programs, target participant (youth or adult), gender and the level of the outcome of interest at program start; shading indicates statistical significance of  $p < 0.05$ .*

*\*\*\* Statistics could not be computed due to lack of variability in the independent variable, or lack of convergence in the model.*

## Qualitative Examination of Individual-level Factors

The conclusion that most of the participants seemed to draw from their experience in the various Colorado Healthy People 2010 Initiative programs was that individual factors were the most influential in determining whether or not people could change their behaviors.

People noted on their surveys that “me, myself and I” stood between them and behavioral change or, conversely, allowed them to make the changes they sought. From a practitioner or researcher perspective, individuals’ emphasis on their own control, or lack of control, as a predictor of change suggests that they were referring to their own readiness to change.

Participants responded strongly to certain program factors, such as imposed accountability and increased awareness. The program’s provision of an external structure and the role of education and awareness-raising are discussed in the

*Program-level* Factors section. An overall comparison of the comments of successful completers with the non-completers and less-successful completers suggests that readiness to change, coupled with nutritional and physical activity awareness, trump all other factors, given otherwise identical circumstances.

### ***Readiness to Change***

The qualitative data, on the whole, suggested that people changed behaviors in reaction to program components and with the support of their communities, but the most pivotal factor seemed to be their own readiness to alter their behaviors and adopt a healthier lifestyle. Some became ready because of their own or a family member's health issues. Excerpts from the focus groups and survey verbatims demonstrate their readiness to change:

- "At some point, I realized the real motivator was just a fundamental choice within myself to lose weight and get more healthy."
- "I think seeing people in our class that were dealing with health issues, very serious health issues. It was sort of a wake up call."
- "You know you really need to work on it, and recognize that it is a lifelong process. And just that you are responsible."
- "You realize there needs to be a change, but you don't know what change, and then you begin to realize what changes you *could* make."
- "You get so busy, you are in denial, and you really don't stop and look at yourself... I think it just really made me see what I wasn't doing."

### ***Motivation Through Accountability***

Although there were many complaints about the dysfunctional aspects of the pedometers (not working in certain situations, tendency to fall off of clothing and so on) and the awkwardness of wearing them on professional clothing, most people responded positively to the feedback they received from a pedometer.

One of the program staff leaders interviewed in 2005 mentioned that participants in her walking program went out of their way each week to drop off their tracking sheets to her in person. She assured several people that they did not need to give them to her if it was a hassle, that the recordkeeping was really just for them. Discouraged from the accountability they needed, they stopped walking altogether.

Survey verbatims and the focus groups illuminated this dynamic that took that program leader by surprise. As it turns out, people reported that they were motivated by having an external person, or group, to whom they were accountable. The following direct quotes from focus groups and survey verbatim responses show how the pedometer tracking fulfilled this need:

- "I just found I like to be motivated by something. Something external... I have to have something besides it just being me that knows I get up and exercise."
- "I found being in a group helped my effort to get off the couch."
- "Having to wear the pedometer, and actually track it, and putting it in the computer, and having it sent back to you – not just writing it down at home – helped me to keep track and actually put my pedometer on in the morning."

For other people, the external source of accountability was their pet dog. The dogs were felt to offer both support and motivation. On surveys and in focus groups, participants talked about the importance of their dogs in increasing and maintaining consistency in their physical activity:

- “Most of the time I have my dog with me. It was a motivator too, to get him walking.”
- “You need to get out, and the dogs want to get out.”

Many felt a sense of commitment because they were accountable to themselves for finishing something that they had begun:

- “I do not like exercise, so it’s been a struggle. Over the years I’ve taken a lot of exercise classes because I know if I get into a class I’ll finish.”
- “I just decided to complete it because . . . once I got started, I thought I’d better finish.”
- “For me, usually when I start something like this I finish it. It’s like, yeah, if you sign up for it, you should do the whole thing!”

### ***Increased Awareness***

Although increased awareness does not cause behavioral change, many people reported that learning more about what to eat and how much they needed to exercise helped them make changes. Some people simply did not know how little they walked or how poorly they ate until they participated in an Initiative program:

- “I do about the same physical activity I have done. I do eat more fruits and veggies because I am more aware of how vital they are to your health.”
- “Increasing my awareness of exercise need.”

## Community-level Factors

Community-level factors examined in this study included respondent ratings of their local community environment, community health indicators, geographic location, weather, access to recreation amenities, access to healthy and unhealthy food options, grocery store assessments of produce offerings and walkability assessments. Some participants lived in communities for which data were not collected. These participants were not included in these analyses. In addition, these analyses were not performed for BMI, as no change was observed in BMI among evaluation participants. These analyses were performed using linear mixed modeling to account for the nested structure of the data (individuals within communities). Results are shown in Tables 28 through 32.

Table 28 Association of Perceived Environment Factors With Changes in Outcomes of Interest

Perceived Environment Factors		Change in number days per week moderate activity 30+ minutes OR vigorous activity 20+ minutes		Change in daily steps		Change in number whole fruit & vegetable servings per week	
		Start to end	Start to follow-up	Start to end	Start to follow-up	Start to end	Start to follow-up
		$\beta$	0.27	0.56	-16	23	
Perceived Neighborhood Environment (Possible Range 1 to 4)	p-value	0.138	0.210	0.979	0.977		
	N	N=317	N=317	N=162	N=162		
	$\beta$	0.27	0.08	-117	-89		
Perceived Access to Physical Activity (Possible Range 0 to 3)	p-value	0.138	0.676	0.611	0.776		
	N	N=315	N=315	N=161	N=161		
	$\beta$					1.42	0.70
Perceived Access to Good Nutrition (Possible Range 0 to 6)	p-value					0.056	0.385
	N					N=242	N=242
	$\beta$					2.08	1.53
Perceived Access to Fruits & Vegetables (Possible Range 1 to 4)	p-value					0.011	0.079
	N					N=260	N=260

*Tested by linear mixed modeling, adjusted for nesting of participants within programs, target participant (youth or adult), gender and the level of the outcome of interest at program start; shading indicates statistical significance of  $p < 0.05$*

Table 29 Association of Community-level Factors With Changes in the Outcomes of Interest

Community-level factors: Secondary data from BRFSS, Census and Weather		Change in number days per week moderate activity 30+ minutes OR vigorous activity 20+ minutes		Change in daily steps		Change in number whole fruit & vegetable servings per week	
		Start to end	Start to follow-up	Start to end	Start to follow-up	Start to end	Start to follow-up
Percent in community rating health as "excellent" or "good"	$\beta$	0.04	0.08	106	244	-0.25	-0.13
	p-value	0.319	0.027	0.053	0.002	0.055	0.313
	N	N=366	N=366	N=158	N=158	N=242	N=242
Percent in community who are overweight	$\beta$	-0.12	0.02	-25	215	-0.38	0.11
	p-value	0.034	0.711	0.847	0.244	0.116	0.637
	N	N=366	N=366	N=158	N=158	N=242	N=242
Percent in community who are obese	$\beta$	-0.07	-0.05	-27	-187	0.06	0.20
	p-value	0.318	0.459	0.796	0.208	0.800	0.411
	N	N=366	N=366	N=158	N=158	N=242	N=242
Percent in community who engage in regular physical activity	$\beta$	0.03	0.05	105	90	/	/
	p-value	0.325	0.165	0.012	0.139	/	/
	N	N=366	N=366	N=158	N=158	/	/
Percent in community who eat 2 or more fruits per day	$\beta$	/	/	/	/	0.11	0.00
	p-value	/	/	/	/	0.470	0.985
	N	/	/	/	/	N=242	N=242
Percent in community who eat 3 or more vegetables per day	$\beta$	/	/	/	/	-0.02	-0.01
	p-value	/	/	/	/	0.552	0.742
	N	/	/	/	/	N=242	N=242
Percent of the population in the community living in a rural setting	$\beta$	-0.01	-0.01	-26	-30	0.05	0.07
	p-value	0.213	0.133	0.051	0.123	0.114	0.025
	N	N=335	N=335	N=142	N=142	N=213	N=213
Front Range (1=Front Range, 0=Mountains or Plains)	$\beta$	0.39	0.79	934	-828	-1.09	0.55
	p-value	0.353	0.080	0.140	0.378	0.474	0.718
	N	N=335	N=335	N=142	N=142	N=213	N=213
Average annual precipitation of community	$\beta$	0.17	0.11	503	372	/	/
	p-value	0.099	0.334	0.023	0.258	/	/
	N	N=336	N=336	N=142	N=142	/	/
Average temperature in January of community	$\beta$	-0.05	-0.03	86	-11	/	/
	p-value	0.354	0.553	0.242	0.916	/	/
	N	N=336	N=336	N=142	N=142	/	/
Average temperature in July of Community	$\beta$	-0.02	-0.06	-73	-230	/	/
	p-value	0.604	0.136	0.195	0.005	/	/
	N	N=336	N=336	N=142	N=142	/	/

Tested by linear mixed modeling, adjusted for nesting of participants within communities, target participant (youth or adult), gender and the level of the outcome of interest at program start; shading indicates statistical significance of  $p < 0.05$ .

Table 30 Association of Community-level Factors With Changes in the Outcomes of Interest

Community-level factors: Community facilities		Change in number days per week moderate activity 30+ minutes OR vigorous activity 20+ minutes		Change in daily steps		Change in number whole fruit & vegetable servings per week	
		Start to end	Start to follow-up	Start to end	Start to follow-up	Start to end	Start to follow-up
		Number of recreation facilities (parks, recreation centers, fields, golf courses, etc) per 1,000 population	$\beta$	0.13	0.07	-17	96
	p-value	0.326	0.640	0.938	0.765	/	/
	N	N=336	N=336	N=142	N=142	/	/
Number of diet centers or weight loss clinics per 1,000 population	$\beta$	/	/	/	/	2.57	4.62
	p-value	/	/	/	/	0.572	0.307
	N	/	/	/	/	N=217	N=217
Number of food service vendors (restaurants, etc.) per 1,000 population	$\beta$	/	/	/	/	0.75	0.58
	p-value	/	/	/	/	0.034	0.099
	N	/	/	/	/	N=217	N=217
Number of fast food restaurants per 1,000 population	$\beta$	/	/	/	/	1.85	-3.76
	p-value	/	/	/	/	0.608	0.294
	N	/	/	/	/	N=217	N=217
Number of buffet restaurants per 1,000 population	$\beta$	/	/	/	/	6.78	-8.74
	p-value	/	/	/	/	0.543	0.431
	N	/	/	/	/	N=217	N=217
Number of places where can get produce per 1,000 population	$\beta$	/	/	/	/	0.31	0.05
	p-value	/	/	/	/	0.084	0.759
	N	/	/	/	/	N=217	N=217

*Tested by linear mixed modeling, adjusted for nesting of participants within communities, target participant (youth or adult), gender and the level of the outcome of interest at program start; shading indicates statistical significance of  $p < 0.05$ .*



Table 31 Association of Community-level Factors With Changes in the Outcomes of Interest

Community-level factors: Grocery Store Assessment		Change in number days per week moderate activity 30+ minutes OR vigorous activity 20+ minutes		Change in daily steps		Change in number whole fruit & vegetable servings per week	
		Start to end	Start to follow-up	Start to end	Start to follow-up	Start to end	Start to follow-up
Level of freshness (1=all 2=most 3=some fresh)	$\beta$					-4.50	-2.59
	p-value					0.045	0.234
	N					N=130	N=130
Availability of any organic produce (0=neither store, 1=1 store, 2=2 stores)	$\beta$					4.57	2.71
	p-value					0.019	0.152
	N					N=130	N=130
Produce section size and variety (product of size and variety)	$\beta$					1.00	0.49
	p-value					0.001	0.109
	N					N=130	N=130
Size of produce section (1=small, 2=medium, 3=large)	$\beta$					3.61	1.67
	p-value					0.002	0.147
	N					N=130	N=130
Variety in produce section (1=1-47 varieties, 2=64-101 varieties, 3=120+ varieties)	$\beta$					3.57	1.85
	p-value					0.002	0.094
	N					N=130	N=130
More than one store (0=1 store, 1=1+ stores)	$\beta$					3.98	1.90
	p-value					0.002	0.123
	N					N=130	N=130
Total varieties of fresh fruit and vegetable (total number of varieties)	$\beta$					7.27	3.69
	p-value					0.001	0.095
	N					N=130	N=130
Minimum price basket of fresh, frozen and canned produce	$\beta$					0.04	0.02
	p-value					0.007	0.153
	N					N=130	N=130
Total square feet of fresh fruit and vegetables	$\beta$					0.00	0.00
	p-value					0.014	0.163
	N					N=130	N=130
Minimum price per 16 oz - of fresh fruits and vegetables basket	$\beta$					16.61	14.54
	p-value					0.019	0.033
	N					N=130	N=130

*Tested by linear mixed modeling, adjusted for nesting of participants within communities, target participant (youth or adult), gender and the level of the outcome of interest at program start; shading indicates statistical significance of  $p < 0.05$ .*

Table 32 Association of Community-level Factors With Changes in the Outcomes of Interest

Community-level factors: Transportation, physical activity and health promotion factors		Change in number days per week moderate activity 30+ minutes OR vigorous activity 20+ minutes		Change in daily steps		Change in number whole fruit & vegetable servings per week	
		Start to end	Start to follow-up	Start to end	Start to follow-up	Start to end	Start to follow-up
		Average percent of streets with sidewalks, street lights, bike paths (1=0%, 2=1-24%, 3 25-49%, 4=50-74%, 5=75-95%, 6=100%)	$\beta$	0.01	0.03	22	12
	p-value	0.571	0.009	0.150	0.586	/	/
	N	N=340	N=340	N=145	N=145	/	/
Miles of unpaved & paved trails and bike lanes per 100,000 population	$\beta$	0.00	0.00	-1	0	/	/
	p-value	0.362	0.133	0.415	0.830	/	/
	N	N=386	N=386	N=166	N=166	/	/
Miles of unpaved & paved trails and bike lanes	$\beta$	0.00	0.00	-1	-4	/	/
	p-value	0.873	0.787	0.537	0.286	/	/
	N	N=386	N=386	N=166	N=166	/	/
Presence facilities for alternate modes of transportation (0=none, 5=most)	$\beta$	0.00	0.01	6	9	/	/
	p-value	0.763	0.109	0.602	0.584	/	/
	N	N=340	N=340	N=145	N=145	/	/
Walkability index (0=least walkable, 10=most walkable)	$\beta$	-0.20	-0.08	-411	122	/	/
	p-value	0.372	0.749	0.168	0.783	/	/
	N	N=213	N=213	N=96	N=96	/	/
Presence of ordinances/policies promoting healthy lifestyles (0=none, 10=most)	$\beta$	0.01	0.01	13	-7	-0.03	-0.01
	p-value	0.371	0.302	0.126	0.579	0.205	0.503
	N	N=340	N=340	N=145	N=145	N=219	N=219
Presence of active health promotion in the community (0=none, 7=most)	$\beta$	0.00	0.01	3	-9	-0.01	0.02
	p-value	0.433	0.065	0.728	0.445	0.653	0.452
	N	N=340	N=340	N=145	N=145	N=219	N=219
Presence of barriers to outdoor physical activity (0=none, 3=most)	$\beta$	0.00	0.00	-5	-28	/	/
	p-value	0.694	0.798	0.667	0.133	/	/
	N	N=386	N=386	N=166	N=166	/	/

*Tested by linear mixed modeling, adjusted for nesting of participants within communities, target participant (youth or adult), gender and the level of the outcome of interest at program start; shading indicates statistical significance of  $p < 0.05$ .*

### Qualitative Examination of Community-level Factors

Follow-up surveys contained open-ended questions such as “What, if anything, has made it hard for you to eat more fruits and vegetables or do more physical activity?” and “If you have increased your physical activity levels or increased your fruit and vegetable consumption, what, if anything, do you think helped you make these changes?” Few respondents volunteered community-level factors as influential in their behavioral changes. Of those who did mention their community’s impact on their choices, they focused primarily on outdoor conditions and produce cost and availability. In the 2006 focus groups, participants were explicitly asked about community-level factors, such as work and family environments, grocery stores, weather and social norms.

### ***Produce Cost and Availability***

The availability and convenience of fresh produce influenced people's nutrition choices:

- Live in rural community where our grocery store doesn't stock very good fruits and veggies.
- Fruits and vegetables are expensive.
- Easier in the summertime, more favorites available.

### ***Outside Conditions***

When prompted in focus groups, participants mentioned several outdoor conditions as barriers to physical activity:

- "Wintertime is hard – it's too cold up here."
- "Dealing with heat – hot weather is hard for me."
- "At 5:30 [PM], you drive home, and it's already dark, so it's hard to go for a walk."

### ***Social Support***

Both successful and unsuccessful participants commonly discussed the support, or lack of support, from family and friends for their proposed lifestyle changes.

#### Presence of Family Support

- "My mom would go on walks with me to help me get more steps."
- "For the first program, my husband was absolutely not supportive. I would make him a meal, and I would have to make myself a meal. But after a while, I just sat him down and said, 'You eat this or you make your own stuff,' and he finally came around."
- "One of the things is we kind of expand it to the family where we go for the walk three to four days a week after dinner."

#### Lack of Family Support

- "My family didn't [support me]! They didn't like the changes I made in our eating!"
- "My husband didn't help me at all. I tried to serve him everything I had, but he didn't appreciate it."
- "My husband, mm mm [no]. And that's okay because I realize you can lead a horse to water, but you can't make them drink. But that didn't have to affect me. I always thought they'd have to be there, and they'd have to be doing this if I was to succeed. And that's just not true."
- "When my dad made dinner, he would usually make a sandwich and chips, but instead of chips, I asked him if I could have a salad."

### ***Environmental Support***

In communities where there were ample trails, accessible recreation centers and community runs, focus group participants cited those as helpful. When prompted, however, people were vocal about the barriers to a healthy lifestyle that they encountered in their environments. Refusing unhealthy foods was a primary obstacle for many people, as was finding time to exercise:

- "I think one of my biggest problems is where I work I have a counter, and everybody brings in goodies and puts them right in front of me!"
- "The hardest thing to let go of is my grandma's cookies."
- "Our social infrastructure and our physical infrastructure don't promote healthy lifestyles. I think in our society you are supposed to jump in your car and go to work and sit there

and eat whatever food is available – you know, the high energy stuff – here’s coffee with caffeine, here’s candy bars.”

- “The hardest part for me was finding time to exercise. I sit at a desk all day, and I am expected to be at that desk at any given point.”

## Program-level Factors

Tables 33 and 34 show the relationship between program-level factors and the outcomes of interest. These analyses were not performed for BMI, as no change was observed among evaluation participants. These analyses were performed using linear mixed modeling to account for the nested structure of the data (individual participants within programs).

Table 33 Association of Program Components with Changes in Outcomes of Interest

Program-level Factors		Change in number days per week moderate activity 30+ minutes OR vigorous activity 20+ minutes		Change in daily steps		Change in number whole fruit & vegetable servings per week	
		Start to end	Start to follow-up	Start to end	Start to follow-up	Start to end	Start to follow-up
		<i>Effective Program Components</i>					
Delivered program included an orientation (1=yes, 0=no)	$\beta$	0.12	-0.45	-1,451	-2,188	4.10	2.41
	p-value	0.759	0.286	0.008	0.005	0.003	0.092
	N	N=386	N=386	N=166	N=166	N=259	N=259
Delivered program included skills-based learning and practice (1=yes, 0=no)	$\beta$	0.27	-0.26	-845	-2,435	3.14	0.04
	p-value	0.487	0.530	0.172	0.005	0.026	0.979
	N	N=380	N=380	N=162	N=162	N=254	N=254
Delivered program included multiple components (1=yes, 0=no)	$\beta$	0.33	-0.82	1,116	-762	-0.15	-3.07
	p-value	0.750	0.457	0.315	0.626	0.984	0.692
	N	N=386	N=386	N=166	N=166	N=259	N=259
Delivered program included strategies for relapse prevention(1=yes, 0=no)	$\beta$	-0.23	-0.72	-1,328	-786	-3.44	-0.34
	p-value	0.692	0.237	0.212	0.601	0.108	0.878
	N	N=386	N=386	N=166	N=166	N=259	N=259
Delivered program included strategies for maintenance(1=yes, 0=no)	$\beta$	-0.31	-0.58	-996	-37	-1.77	-1.24
	p-value	0.495	0.228	0.113	0.967	0.355	0.526
	N	N=386	N=386	N=166	N=166	N=259	N=259
Contact intensity of delivered program (0=low, 0.5=medium, 1=high)	$\beta$	0.22	-0.68	-2,032	-4,179	6.56	1.67
	p-value	0.745	0.350	0.047	0.004	0.002	0.421
	N	N=380	N=380	N=162	N=162	N=358	N=358
Tailoring Program for Participants Index (1=4 types, 0=no type of tailoring)	$\beta$	-0.43	-0.78	-2,191	-3,379	4.03	0.21
	p-value	0.489	0.236	0.033	0.020	0.034	0.911
	N	N=380	N=380	N=162	N=162	N=358	N=358
Delivered program included goal-setting (1=yes, 0=no)	$\beta$	-0.40	-0.36	-1,276	-1,169	1.58	-0.39
	p-value	0.287	0.369	0.021	0.136	0.178	0.732
	N	N=380	N=380	N=162	N=162	N=358	N=358
Delivered program included self-monitoring (1=yes, 0=no)	$\beta$	-0.62	0.61	156	-57	-1.36	-1.79
	p-value	0.212	0.253	0.842	0.959	0.364	0.218
	N	N=380	N=380	N=162	N=162	N=358	N=358
Delivered program included support groups (1=yes, 0=no)	$\beta$	0.41	-0.62	-1,342	-2,585	2.49	1.81
	p-value	0.285	0.126	0.020	0.002	0.032	0.110
	N	N=368	N=368	N=152	N=152	N=358	N=358
Delivered program included a coach (1=yes, 0=no)	$\beta$	0.15	-0.57	-1,210	-2,530	3.38	2.60
	p-value	0.710	0.179	0.035	0.002	0.005	0.029
	N	N=368	N=368	N=152	N=152	N=358	N=358
Delivered program included incentives (1=yes, 0=no)	$\beta$	0.03	0.45	671	734	-1.27	1.02
	p-value	0.929	0.254	0.222	0.347	0.256	0.351
	N	N=380	N=380	N=162	N=162	N=358	N=358
Program included a multi-organizational campaign (1=yes, 0=no)	$\beta$	-0.72	-0.62	-400	988	-1.28	0.19
	p-value	0.130	0.221	0.517	0.259	0.370	0.889
	N	N=380	N=380	N=162	N=162	N=358	N=358
Effectiveness Index (Average of Above Components)	$\beta$	-0.41	-1.74	-4,212	-6,138	7.18	3.77
	p-value	0.694	0.113	0.004	0.003	0.025	0.225
	N	N=386	N=386	N=166	N=166	N=363	N=363

*Tested by linear mixed modeling, adjusted for nesting of participants within programs, target participant (youth or adult), gender and the level of the outcome of interest at program start; shading indicates statistical significance of  $p < 0.05$ .*

Table 34 Association of Program-level Factors with Changes in Outcomes of Interest

Program-level Factors		Change in number days per week moderate activity 30+ minutes OR vigorous activity 20+ minutes		Change in daily steps		Change in number whole fruit & vegetable servings per week	
		Start to end	Start to follow-up	Start to end	Start to follow-up	Start to end	Start to follow-up
		<i>Levels of socio-ecological model addressed by program</i>					
Interpersonal (1=yes, 0=no)	$\beta$	0.40	0.43	400	-988	1.04	-0.64
	p-value	0.343	0.338	0.517	0.259	0.409	0.605
	N	N=380	N=380	N=162	N=162	N=358	N=358
Organizational (1=yes, 0=no)	$\beta$	0.24	0.58	909	946	-1.32	-1.27
	p-value	0.535	0.158	0.095	0.220	0.266	0.275
	N	N=380	N=380	N=162	N=162	N=358	N=358
Community (1=yes, 0=no)	$\beta$	-0.39	-0.75	-841	-394	1.03	-2.82
	p-value	0.345	0.088	0.127	0.616	0.433	0.028
	N	N=380	N=380	N=162	N=162	N=358	N=358
Total number of levels of SEM addressed (1=all 4 levels, including individual, 0.66=3 levels, 0.33=2 levels, 0=individual level only)	$\beta$	0.38	0.48	624	-321	0.83	-7.61
	p-value	0.663	0.603	0.596	0.847	0.768	0.005
	N	N=380	N=380	N=162	N=162	N=358	N=358
<i>Elements of social cognitive theory addressed</i>							
Knowledge (1=yes, 0=no)	$\beta$	-0.06	-0.40	-1,690	-1,824	3.42	2.07
	p-value	0.894	0.366	0.002	0.020	0.006	0.091
	N	N=380	N=380	N=162	N=162	N=358	N=358
Attitude (1=yes, 0=no)	$\beta$	0.18	-0.28	-725	-2,799	4.29	0.61
	p-value	0.670	0.524	0.274	0.003	0.001	0.631
	N	N=380	N=380	N=162	N=162	N=358	N=358
Behavior (1=yes, 0=no)	$\beta$	-0.22	0.61	638	3,017	-4.94	1.12
	p-value	0.663	0.261	0.406	0.005	0.003	0.491
	N	N=380	N=380	N=162	N=162	N=358	N=358
<i>Other Program Factors</i>							
Ties to community index (1=most positive, 0=most negative)	$\beta$	0.62	0.99	2,850	530	1.43	-4.79
	p-value	0.509	0.320	0.046	0.793	0.691	0.191
	N	N=386	N=386	N=166	N=166	N=259	N=259
Reach to intended population index (1=most positive, 0=most negative)	$\beta$	0.17	0.90	-1,628	1,298	-4.42	-1.73
	p-value	0.869	0.401	0.240	0.507	0.265	0.668
	N	N=386	N=386	N=166	N=166	N=259	N=259
Data tracking index (1=most positive, 0=most negative)	$\beta$	1.35	-0.44	-715	-3,239	8.44	1.51
	p-value	0.163	0.667	0.598	0.088	0.094	0.768
	N	N=386	N=386	N=166	N=166	N=259	N=259
Program was delivered as intended (1=yes, .5=middle, 0=no)	$\beta$	0.81	-1.96	-207	-67	0.65	-4.04
	p-value	0.389	0.048	0.889	0.974	0.880	0.356
	N	N=386	N=386	N=166	N=166	N=259	N=259
Program aimed at high-risk individuals? (1=High-risk, 0=General Population)	$\beta$	0.14	-1.11	-922	-2,501	1.76	-2.05
	p-value	0.749	0.019	0.140	0.004	0.239	0.179
	N	N=386	N=386	N=166	N=166	N=259	N=259
Workplace intervention? (1=Workplace, 0=Non-workplace)	$\beta$	0.10	0.66	1,152	956	-3.39	-2.04
	p-value	0.803	0.138	0.038	0.222	0.015	0.156
	N	N=386	N=386	N=166	N=166	N=259	N=259

Tested by linear mixed modeling, adjusted for nesting of participants within programs, target participant (youth or adult), gender and the level of the outcome of interest at program start; shading indicates statistical significance of  $p < 0.05$ .

## Change in Outcomes by Degree to which Outcomes Were Targeted by Program

Not all programs included components designed to change each of the behavioral outcomes of interest to this evaluation. However, almost every program agreed to let participants answer questions about each of the outcomes, although several did not want to include a question about weight as they felt it would be counter to their programming.

Table 35 shows the association of the changes in the outcomes of interest by the degree to which those outcomes were targeted by the program in which the participant was involved. Changes in the outcomes of interest were not significantly different between the different degrees to which the outcome of interest was targeted. Although for physical activity, daily steps and produce consumption, the results are in the positive direction as anticipated.

Table 35: Change in Outcomes of Interest by Degree to Which Outcome Was Targeted by Program

Degree to outcome of interest was targeted	Change from start to end: Number days per week moderate activity 30+ minutes OR vigorous activity 20+ minutes	Change from start to follow-up: Number days per week moderate activity 30+ minutes OR vigorous activity 20+ minutes	Change from start to follow-up: Daily steps		Change from start to end: Number whole fruit & vegetable servings per week	Change from start to follow-up: Number whole fruit & vegetable servings per week	Change from start to end: Body Mass Index	Change from start to follow-up: Body Mass Index
			Change from start to end: Daily steps	Change from start to follow-up: Daily steps				
None	---	----	---	----	0.40	-0.40	-0.39	-0.42
Low	---	----	-407	716	0.17	0.01	-0.06	0.23
Medium	0.25	0.34	-384	-541	2.01	2.15	-0.35	-0.31
High	1.05	0.66	771	1,063	4.30	2.66	---	----
Number of participants	N=394	N=394	N=176	N=176	N=371	N=371	N=276	N=276

\* $p < 0.05$ ; † $p < 0.01$ ; ‡ $p < 0.001$ , tested by linear mixed modeling, adjusted for nesting of participants within programs, target participant (youth or adult), gender and the level of the outcome of interest at program start.

## Qualitative Examination of Program-level Factors

One motivator that held sway in each program, no matter the level of dosage, was the strength of participants' affiliation to their program. Both focus group discussions and survey verbatims confirmed that many people felt they needed some sort of program. Having an external structure that asked them to be accountable made a difference for many people, even when they felt they did not learn anything new from the program itself.

As discussed in the *Individual-level Factors* section of this report, for many participants, commitment to changing behavior came about through a shift in their own self-realization; however, the self-realization was either sparked by or supported by some aspect of the program. Focus group participants, whether or not they had completed their programs or felt they had made behavioral changes as a result, had similar things to say about what they considered helpful characteristics of a healthy lifestyle program. They perceived the most pivotal aspects of the programs to be (in order of prevalence):

- External structure
- Pedometer step tracking

- Awareness-raising and “small changes”
- Nutrition education
- Peer support
- Program interaction
- Incentives.

### ***External Structure***

When asked on the program-end and follow-up surveys what was helpful in improving nutrition or activity level, most people wrote either the name of a specific program or an athletic event, such as a race. The most frequently cited programs were Weight Watchers and the Colorado Healthy People 2010 Initiative programs in which the respondents were enrolled. For youth, a team sport or extracurricular class was frequently cited.

Those who changed some aspect of their lifestyle explained their need for a program to help them create better habits:

- “I like to be motivated by something, something external. I like to have a goal, to set goals, and it helped me. . . I have to have something that motivates me – to log it or record it or get a prize for it or a gold star on my chart.”
- “Somebody was giving me a tool to succeed at something I enjoyed doing [i.e., walking], with somebody I liked being with [i.e., dog], so I figured I’d better give it a try.”
- “You write it down and you commit. You keep track of all your steps, and it’s just something you can be held accountable for walking this much. It keeps you motivated.”
- “You have more of a reason to do it today instead of waiting until tomorrow.”
- “I am basically a lazy individual. Participation in the program gave me the push I needed, but there were many times I would have preferred to watch TV than exercise.”

### ***Pedometer Step Tracking***

Participants enjoyed seeing their progress and having a steps goal:

- “The pedometers helped because it gives you something tangible to see how well you are doing as you go through the day, and it’s something to compare from today to the next day.”
- “You didn’t want to fall behind because you would be letting your troop down. You kind of wanted to have a goal so that you’d be on track.”
- “I thought it would be a good thing for us all to do. I hate exercising, but we did it anyway. It was interesting to see how many steps we would take to do things like mow the lawn.”

For some, walking daily was a sustainable change:

- “It put me on a regular schedule with people to walk with. Very easy with others.”
- “For me, it became a habit – every day putting it on and just checking where you were during the day. Every day after I stopped using it, I still had the thinking, ‘Well, how far did I walk today? What did I do today?’”
- “It was good trying to get the 10,000 steps. Pretty soon you just know, you don’t always have to wear it.”
- “I enjoy the built-in way [the program] didn’t make [walking] a big burden on top of everything else I have to do already.”



### ***Awareness-raising and Small Changes***

Participants talked about the various ways their awareness was raised. Some learned from the class content, others from listening to fellow participants' health histories and others from handouts. Many learned that small changes made a difference in how they felt:

- "It's really amazing how little you have to do. You are surprised that just a little change makes a huge difference. It really does."
- "One day I'd come home and instead of grabbing a Twinkie, I'd grab a granola bar, and little things like that. With the program, they started mentioning parking further away and using the steps instead of the elevator and stuff like that."
- "I think it was just the awareness of how much exercise it really took to walk off the food you ate, and I think a lot of us thought we walked more than we did."
- "I think the big difference is how this program is designed to work in all the little things, just like reframing, you know – intending to move as much as possible."
- "All the things by themselves were minor changes, but together, just seeing the numbers made me understand where my baseline health was at, and at the end of 10 weeks, it really surprised me."

Once they felt different, some people were able to sustain their behavior changes, especially regarding exercise. Individuals spoke of how their new feelings propelled them forward:

- "The need to get exercise and the physical results of that exercise; like the way I feel, healthy. It is important to me."
- "How good I feel after exercising – makes me want to do it more!"
- I think noticing the effect on day-to-day feeling keeps me going.
- "When I got the survey, and it asked the question have you increased your fruits and vegetables... I noticed from the beginning to the middle to the end, there was a huge increase. And I have to say too that my health changed dramatically. One, acquiring a good habit, and then, two, not having to snack as much. Then, when I did snack, changing my habits as to what I snacked on. As opposed to a cookie or whatever, sometimes I would do almonds or granola."

### ***Nutrition Education***

Whereas increasing physical activity required external accountability for many people, improving nutrition was largely a matter of education. Numerous people reported that the program – and the survey itself – served as a reminder to eat more fruits and vegetables. One elaborated on why the reminder was important, especially in the wake of low and no carbohydrate diets popular during the time of the Initiative:

- "The reminder of the importance of eating more fruits and veggies, especially since the media influence of carbs being bad was a fad at the time."

Even more effective than the reminders, many people simply learned things about nutrition that they had never known before:

- "I think the surprising part of it is – as old as I am, I feel we hadn't been educated on so many things. Nobody taught me this kind of stuff before [i.e., avoiding certain foods, reading labels]. . . Well, that's not common knowledge."
- "Learning portion sizes and how diabetes works."
- "Seeing examples (models) of fat content in foods."
- "Made me realize what a serving of F/V [fruits and vegetables] is and that I need to eat more of them."
- "Learning about the foods I have never tried and the 9-inch dinner plate."

Participants seemed to respond most strongly to the more in-depth, hands-on demonstrations of nutrition:

- “In the past, I had never paid any attention to any of the labels, but after that class, when we go to the grocer, I look at the labels to see what is good and what is bad.”
- “When you went to the clinic, they did your blood work and had a lot of boxes for you to look at of what you should eat and look at. But I didn’t think they forced it enough, or maybe I just didn’t listen. I don’t know what it was. Now, with this program, the instructors – not only are they teaching you how to eat but how to read the boxes – you know when you look at it, about fat grams and all of this stuff. I’m thinking, well, this really has that many? Well, now I am learning what that means, and I think it’s going to be really helpful.”
- “I was pleased that it was not just lectures. I really liked that fact and the fact, like J. brought up, is that they actually showed him the portions of what you could survive on and be content with, besides a whole plate of pasta! I enjoyed the cooking class. I enjoyed that when they showed us the differences. I didn’t expect that.”
- “She would bring alternatives for us, and we did taste testing. That was really neat.”

### ***Peer Support***

Participants spoke positively about programs that had a group interaction element to them. Common themes were mutual support, accountability and social outlet.

### Presence of Peer Support

- “It’s fantastic to get together with a group, but I wish it could be every day. Doing it together was a good feel for a lot of us. It was encouraging, and that really helped to do it together.”
- “The program kept you from cheating and kept you motivated to do it when you wouldn’t on your own.”
- “I think the one thing that really helped was the community support. I mean I’d be absolutely down and eating something in my hand, and you’d go into the library, and someone would say, ‘That’s not a vegetable!’”
- “I think one thing that helps in the motivation – when you are in a group you keep going . . . I want to see all these people. I want to meet with them. There’s a lot of reinforcement because now we know each other, and none of us knew each other before we started this. There is a lot of reinforcement to keep going even when you feel you might not want to go, so you say, well, I can go today. For me, if I had to sit at home and exercise, I’d never do it. I’ve never exercised because there was always something that had to be done. This way it’s like a discipline.”

### Lack of Peer Support

Conversely, some people expressed their disappointment in their program’s lack of built-in group support:

- “I did it because I thought there would be more group sessions for exercising and stuff, which really didn’t happen.”
- “I would have liked to have met more people, but we never met anybody else. It was like a lecture, and they talked, which was good, and the information was good, but we didn’t get to share any of our efforts or trials or exchange information with the other people. They could say how are you doing and oh, that would be a good idea, I could try that.

You know, we didn't have that kind of exchange with the other people who were doing the same things that we were trying to do."

### ***Program Interaction***

In the early focus groups that were held closer to the programming period, participants' comments were more focused on the specific elements of the program that helped or hindered them. For example, they enjoyed the individual attention from program staff and, in general, felt the role of the instructor was critical. In later groups and in follow-up surveys, these factors were rarely mentioned.

### Effective Instructors

Some participants felt motivated by their instructors:

- "I think what helped us along is the leader we had. She was fantastic. She really kept us going."
- "But I think everyone in our group finished. We did really good, and everyone was enthused with the success they achieved. Our leader was fantastic. She really did a good job."
- "The instructors... came up with a program. They wait for you downstairs so you don't take the elevator and get you to take the stairs, and they walk with you. They wait for everyone to get there, and we'll all walk up the stairs together just to encourage people... So that was one thing I did like about the program – that the girls really went out of their way to encourage all of the participants."

### Follow-up and One-on-one

After the programs ended, focus group participants – even successful completers – wished they had had follow-up and one-on-one counseling:

- "I think one of the real problems was that the people who were trying to address the program weren't properly trained. Because every time I went in, they had a new intern and I'd say, 'Who are you?' And then that intern would walk away, or the person who was in charge would just walk away and leave the intern, and the intern would just sit. They'd put your blood into that little machine, and it would print out and tell you what your cholesterol is and all the other levels."
- "She would check everything we had written down and check how much we had walked, and how much our exercise was, and talk about our values, what we had eaten, so it was pretty thorough for us. I know I didn't really feel I had any problems because I'm not diabetic. But going through this I found out I had high cholesterol and triglyceride which I didn't know."

Non-completers and those who were less successful seemed especially disappointed when there was little follow-up or counseling involved in the program:

- "Somehow keeping the awareness going. Instead of just doing the program and you're done and you don't hear anything for a year and nobody is thinking about it anymore and you go back to your old ways."
- "Not being just dropped. Something that says are you still alive? Or something like that. Something to encourage you. It just seems like once you are out of the program – yeah you can go ahead and walk and sometimes you meet someone on the street and they'll say how are you doing? But after a week or so no one talks about it anymore."
- "They asked me if I had done any changes as far as eating habits, and that was the extent of it. There was nothing else."

### ***Incentives***

At all stages of program participation and follow-up, participants rarely talked about standard program incentives (e.g., gift certificates and other prizes) as motivators. When specifically asked about incentives, they dismissed them as less important than the fellowship they had experienced and actual changes they had felt in their bodies. One said, “We have done away with the prizes and all that garbage.”

The only incentives that seemed to sway participants was competition over number of steps achieved and benefits for their dogs.

Competition took a variety of forms: Workplace to workplace, department to department, inter-city and individual to individual:

- “I’m real competitive, and I thought there’s no reason we can’t have more steps than they do.”
- “Of course I wanted to have more steps than she [my sister] did!”
- “I was trying to compete with the ladies at the gym, as they made it a contest, so that made it an incentive to try to do more.”

People involved in dog walking mentioned that they joined because they thought it would benefit their dogs in some way:

- “Every time you finished a couple of weeks, the dog got a toy!”
- “Yeah, that’s definitely why I did it – so the dog could get some free stuff and I’d get to walk.”
- “I needed to exercise because I am getting up there, and I have one dog that needed to exercise because she is getting up there, and it helped us.”
- “I loved walking with my dog. I love my dog.”

Many people were motivated by intangible incentives such as feeling better and wanting to avoid disease. People mentioned clothing fitting better, having more energy and fewer aches and pains.

Overall, the incentives that participants responded to were competition (whether with themselves, other cities or co-workers), losing weight and the reinforcement of feeling better once they had made lifestyle changes. For some, fear of disease or obesity provided an incentive. People’s comments about what prompted them to sustain change provide insight into these intangible incentives:

- “Seeing what people that don’t exercise look like.”
- “We had a couple of pretty severe diabetics, very large people, come in. I’m sitting there thinking, ‘Oh my gosh, you are a borderline diabetic, and you’d better get it together right now, or that’s what you are going to end up with.’ I mean that scared me to death. ‘This can really happen,’ [I said to myself], ‘so get control!’”
- “Looking at the clothes I can’t wear anymore.”
- “Seeing a difference.”
- “When I exercise mentally and emotionally, I feel like I’m in control, and I just feel so good.”

### ***Program Sustainability***

Given the relatively small amount of sustained change demonstrated in participants’ follow-up surveys and given the wide variety of programs funded under this Initiative, NRC and the expert

panelists thought it would be beneficial to know which programs were able to sustain after Initiative funding ceased. (See Appendix VIII: Program Sustainability – Results of the Follow-up Program Staff Interviews for full analysis.)

Although some organizations had ceased their Initiative-funded programs once the grant ended, most had not scaled back on either services or emphasis on healthy lifestyles. Program leaders' responses suggested that most of the programs currently were providing more services than they did while the Initiative funded their program and had more of a focus on physical activity.

Some programs secured additional funding to support continued Colorado Healthy People 2010 programming, while others simply incorporated healthy lifestyle activities into pre-existent programming. According to the leaders, increasing their own knowledge and awareness of healthy lifestyles in itself had a positive impact on programming in their communities.

The program leaders all felt that they had learned from their experiences with the Initiative programs in ways that built their organizational capacity. Some learned to collaborate more effectively with other community organizations, while others learned about program management.

Twelve of the program leaders interviewed viewed their programs as sustained on at least one level. In the literature, one factor that is associated with sustainability is incorporation of new programming into the existing organizational structure.<sup>49, 50</sup> Five leaders said they learned how to incorporate either Colorado Healthy People 2010 program practices or philosophies into programming that was already intrinsic to their organization:

- "To make sure you get through some of those things so that the programs can work in coordination with existing programs and not be so isolated out there. We've been able to pull it back in, and I think it fits better now, but I know that was a little bit of an issue."
- "The recreational activity - like I said - we've been really trying to continue and to incorporate some of the fun aspects into our activities."
- "[S]ystems should be developed that fit into existing program structures, that don't cost more once they are developed."
- "In large part, those programs that were organized by a well-established agency, such as a hospital, a university or an extension office, sustained their programs in more recognizable ways than did the smaller community-based organizations."

## **Conclusions and Recommendations**

### ***Behavioral Outcomes of Colorado Healthy People 2010 Initiative Participants***

The results from this study suggest that the Initiative was successful at increasing physical activity and fruit and vegetable consumption in program participants. Improved behaviors were sustained 12 months after program end. The gains made by participants were modest, however, and decreased from program end to follow-up. These results are similar to other studies of community-based programs designed to increase physical activity and improve nutrition, where results ranged from none<sup>51, 52</sup> to statistically significant but modest increases.<sup>52-60</sup> The reduction in levels of the behavioral outcomes at follow-up also supports the literature on many, if not most, behavioral interventions: the largest gains are experienced at program end and taper off over time.<sup>53, 54</sup>

The area with the most sustained success was found in steps programs that encouraged increased walking. Although walking does not burn the same number of calories as moderate or vigorous exercise, “a simple rule of thumb is 100 calories per mile for a 160 pound person.”<sup>61</sup> Participants showed significant increases in daily steps at both program end and follow-up unlike the other behavioral outcomes where sustained levels waned after program end. On average, one year later, participants recorded making more than 1,100 more steps per day than they had when the community intervention ended. Other pedometer programs have observed greater increases in steps,<sup>55, 62</sup> but those studies involved a much smaller intervention group and did not include a measure of sustained change, which was a uniquely positive finding in this obesity prevention evaluation.

Although modest changes were found in many of the behaviors antecedent to obesity (physical activity and nutrition), the results of this evaluation did not demonstrate that adult individuals in these programs reduced their BMI. On the other hand, neither did participants gain weight during their participation in these programs nor in the year following their program involvement. Over the long-term, weight maintenance is seen as key to reducing the prevalence of obesity.<sup>1</sup> Because most participants maintained their baseline weight at the 1 year follow-up, this may be viewed as a success, particularly as the rate of overweight or obesity continues to increase in the rest of the population.<sup>63, 64</sup> However, it may also be that the relatively short time frame or low dosage of some programs (which ranged from a single meeting to activities lasting 3 years) may not have been sufficient to encourage the amount of weight loss necessary to affect BMI. Additionally, weight loss was not a major focus of most of the programs; over two-thirds had no focus on weight loss, or little focus. Other community-based programs (outside this Initiative) where weight loss was a major goal also have shown no progress toward this objective.<sup>65, 66</sup>

### ***Relationships Between Individual-level, Program-level and Community-level Factors and Outcomes***

Obesity is a multi-faceted public health issue. Successful gains in the control of the disease and its antecedent behaviors may be influenced by myriad factors. As a part of this study, more than 150 individual, program and community factors were examined to determine what part, if any, they played in the behavioral changes observed in physical activity, nutrition and obesity.

#### **Individual Factors**

Baseline levels of the outcomes of interest showed strong associations with changes in these outcomes; those who started programs with worse behavior on a particular outcome showed greater improvement, on average, over time than did those who began with better behaviors. These findings either suggested that programs were most effective in creating change among those who needed it the most or that those who started at lower levels to begin with had more room to make greater increases. If a respondent already was exercising 4 or 5 days per week, the most that can be added is another 2 or 3 days of exercise, while those who did little exercise to begin might find it easier to add more days of physical activity.

Few demographic characteristics were associated with changes in the outcomes of interest. However, youth participants made greater increases, on average, in days of physical activity and daily steps than did their adult counterparts. Likewise, employed adults made greater increases in daily steps, on average, than did adults who were not employed. Higher ratings of self-reported health status were associated with greater increases in days of physical activity and daily steps from program start to end, while lower health ratings were associated with smaller increases in days of physical activity and daily steps. However, higher

ratings of self-reported health status were associated with smaller increases in fruit and vegetable consumption. It may be that those who felt healthier were empowered to be physically active while those who felt their health was not as good felt more compelled to improve their eating behaviors.

Perceived personal risk (measured as whether or not the respondent had been diagnosed with cancer, diabetes and/or heart disease in the last 2 years) was associated with greater increases, on average, in daily steps from program start to follow-up. It may be that those whose health improved were more motivated to continue increasing their steps even after they finished their program.

Higher ratings of self-efficacy and readiness to change in the area of physical activity were associated with greater increases in days of physical activity.

Greater increases in fruit and vegetable consumption were observed on average, among those with greater social support from friends. Also, those who were higher on the readiness to change scale made greater increases, on average, in fruit and vegetable consumption than did those who were less ready to change.

There were almost no results of statistical significance from the dose-response analyses. The reasons for the lack of associations could be that the dosage of most programs was relatively low, the quality of programs varied and the use of research-based techniques was limited in many cases. The change in produce consumed was the only outcome affected by dosage; It is not clear why.

According to the qualitative data, participants felt that the individual was the critical factor in making behavioral change. They believed that their own readiness to make changes, the amount of knowledge they had about nutrition and their own motivation level either helped or hindered their ability to improve their lifestyle choices.

### Community Factors

While much cross-sectional research has been done which examines the built environment, land use patterns and transportation patterns with physical activity and obesity, little has been done to examine to what extent these factors help or hinder individuals trying to improve their health. Likewise, some research has examined the relationship between a work or school environment and dietary habits, but less has been done at the community level.

In this study, greater increases in days of physical activity and steps were found for participants in communities where a higher proportion of residents rated their health positively and where fewer residents were overweight or engaged in more physical activity than for participants in communities where a lower proportion of residents rated their health positively and where more residents were overweight or inactive.

Some weather conditions also were associated with increased steps. Participants in communities with hotter July temperatures had smaller increases in daily steps than participants in communities with cooler July temperatures. However, those who lived in communities with higher average annual precipitation had greater increases in daily steps from program start to end than did those in communities with lower average annual precipitation. These contradictory findings do not present a pattern from which to draw conclusions about the impact of weather on physical activity.

Access to more active modes of transportation such as walking and biking was found to be associated with increases in physical activity: Participants in communities where there were higher percentages of streets with sidewalks, street lights and bike paths had greater increases, on average, in days of physical activity from program start to follow-up than participants in communities with lower percentages of streets that included these amenities.

Other measures of community walkability and access to facilities where physical activity can be performed also were not associated with changes in physical activity or daily steps. It may be that these indicators were too far removed from the participants; that is, a measure of the miles of bike paths in a community may not matter as much as whether the bike path is located close to a participant's home and connects to places that the participant wants to go. Further, participants' perceptions of walkability also were found to have non-significant relationships with physical activity and daily step levels. This may be due to the relatively small levels of change in the behavioral outcomes.

Increased fruit and vegetable consumption was more evident in communities with multiple stores and where stores offered larger amounts and larger varieties of fresh produce. Perceived access to produce also was significantly associated with increased intake. Expensive produce also was associated with greater positive changes in the number of produce servings consumed per week. This finding likely indicates that higher prices were associated with other factors, such as greater levels of freshness and a wider selection.

According to the qualitative data, environmental and social factors, though not dominant in people's minds, did seem to influence behaviors. Most notable among those community-level factors participants mentioned were: weather, produce cost and availability and social support. From the participants' perspectives, social and environmental conditions were especially influential in presenting obstacles to a healthy lifestyle.

### Program Factors

Many of the program components identified as effective in producing behavior change were positively associated with increased fruit and vegetable consumption. The specific components related to significant increases in produce intake included the use of a program orientation, the use of skill-based learning practices, contact intensity, program tailoring, the use of support groups and the presence of a coach or mentor. These evidence-based program components significantly influenced the change in fruits and vegetables consumed per week by individuals from start to end, but only the coach or mentor's influence persisted 1 year later at follow-up.

For daily steps, many of the program components were not positively related to increased steps. Indeed, many promising programmatic practices from the literature showed a negative correlation. Most of the significant negative associations from start to end persisted in start to follow-up. Significant negative correlates included orientation, skills-based learning, contact intensity, program tailoring, goal-setting, support groups and coach or mentor. Although initially surprising, the opposite direction of the association might be explained by the fact that steps programs are simple, population-based interventions, and as such, do not require the same level of programming intensity as other health interventions. No coach, support groups, orientation or skills-based learning was necessary because the pedometer itself was in contact with the participant on a daily basis. In addition, the (mental or actual) steps logging that accompanies a pedometer may have served as the program accountability that people felt they needed.



Over the past decade, many interventions have focused on obesity control, increased physical activity and improved nutrition. One overarching theory that has gained increasing prominence among behavioral theorists posits that interventions aimed at multiple levels of society will have greater efficacy over time.<sup>67-69</sup> However, results of this obesity prevention evaluation showed no association between participant increases in healthy behaviors and the number of levels of the socio-ecological model targeted. It may be that the length of the interventions was not sufficient to allow the impact of changes made at other levels to be felt. For example, changing a policy or adding a new facility takes a long time to accomplish and additional time may be needed before the change begins to affect individual behavior. Additionally, activities occurring at varying levels of the socio-ecological model may not have been coordinated effectively, as this programmatic model was not one emphasized in the Initiative.

The programs' relationship to behavioral outcomes was analyzed based on the elements of social cognitive theory addressed – knowledge, attitude and behavior. Steps programs were positively associated with programs focused on behavior, while produce consumption was positively associated with programs targeting knowledge and attitude. Most of the nutrition-oriented programs were in classroom settings aimed at increasing knowledge and changing attitudes.

Participants in programs that tried to influence behavior showed lower increases, on average, in fruit and vegetable consumption from program start to program end. This association was not significant for changes in fruit and vegetable consumption from program start to follow-up. It should be noted that the fact that a program targeted behavior was coded generically for all programs, not specifically for each outcome of interest. Thus, it may be that programs with a behavior focus were targeting behaviors other than fruit and vegetable consumption.

Other program factors relating to program quality and program population targets showed some significant correlations. For instance, participants in programs aimed at high-risk individuals had lower average increases in physical activity than did participants in programs aimed at the general population, possibly because physical activity behavior change is more challenging in high-risk populations.

Participants in programs that were familiar with their target populations and well-connected to their communities or those situated at a worksite tended to show increases in steps. It may be that those programs were more successful at marketing to their target populations and addressing participants' needs.

Participants in workplace interventions showed smaller increases in fruit and vegetable consumption than did those in interventions in other settings. This is not surprising given that workplace programs focused more on steps and walking groups than they did on nutrition. However, participants in workplace interventions had greater increases in daily steps, on average, than did participants in other settings.

Participant outcomes also were analyzed by the degree to which each program targeted a given outcome. No statistically significant associations were found, although results were in the expected direction for physical activity, daily steps and produce consumption, with greater increases seen in programs with more of a focus on these outcomes. It may be that although a program did not particularly emphasize certain outcomes, participants making positive behavior changes in one area carried that over to other areas.

The qualitative data suggested that the program's ability to offer structure, accountability and peer and instructor support, along with nutritional education, mattered the most to participants in their assessments of what helped them to make behavioral changes. Once they felt healthier, they then were motivated to continue.

Interviews with program leaders after the Initiative had ended suggested that some program elements, which either could be incorporated easily or were perceived by staff as particularly effective, remained part of the organization's service provision. Thus, important organizational changes were sustained and the potential for long-term community impact remains throughout Colorado.

## **Conclusions**

According to Richard Carmona, U.S. Surgeon General from 2002 to 2006, "As a society, we can no longer afford to make poor health choices such as being physically inactive and eating an unhealthy diet; these choices have led to a tremendous obesity epidemic. As policymakers and health professionals, we must embrace small steps toward coordinated policy and environmental changes that will help Americans live longer, better, healthier lives."<sup>70</sup> The Colorado Trust's Colorado Healthy People 2010 Initiative was launched to empower communities in the state to begin making positive health choices.

### ***Program participants made modest, but positive, changes in the outcomes of interest.***

The results from this study suggest that, overall, program participants were able to increase physical activity and fruit and vegetable consumption. Although small, these changes were sustained over time. Among their physical behavior changes, participants were most likely to have sustained their steps increases. On average, respondents maintained their weight during the course of the evaluation.

Because BMI is difficult to alter and because most of these programs were not intensive weight loss interventions, it may be unreasonable to expect a change in BMI. Given the trend toward overweight and obesity in Colorado and indeed in the nation as a whole, the fact that participants did not generally gain weight is a noteworthy success.

Although much has been published about the impacts of short-term physical activity and obesity interventions, little evidence about the long-term outcomes of weight loss or enhanced physical activity programs exists from non-clinical settings.<sup>9</sup> The preliminary results from this evaluation demonstrate that community-based organizations and local health care providers can help residents strive to improve their health. Gains made by these Initiative programs were modest, but significant, steps toward addressing the nation's obesity epidemic.

### ***Exploratory analyses of the associations between factors at various levels of the socio-ecological model and changes in the outcomes of interest provide promising paths for future programming and research.***

The finding that individuals who had worse baseline healthy behaviors may improve more than their healthier counterparts can focus program providers and funders on leveraging resources toward the population most likely to improve health status.

In another example, programs that target individuals who are ready to change their nutritional behaviors will achieve better outcomes by providing social support and basic education.

How individuals felt about their health and themselves affected their ability to increase their physical activity and their steps. It is important for program providers to recognize that programs may be more effective when they tap into individuals' self-perceptions and, related to that, individuals' readiness to change.

The qualitative data supported the idea that the individual's motivation to change was critical to successful outcomes over time.

The context in which an individual is attempting to make behavior change can influence the degree to which he or she will be successful. This obesity prevention evaluation found that the size and variety of the produce available in a community's grocery store can influence the amount of change individuals make in their fruit and vegetable consumption.

In deciding how to have the most impact on a community's health, funders may be interested in the finding that program participants in healthier communities tended to increase their levels of exercise more than did individuals in less healthy communities. Along these same lines, increased fruit and vegetable consumption was more evident in communities with more fresh produce. The qualitative data supported these findings: participants believed that their health behaviors were influenced by their environment. In this context, environment includes community facilities, grocery stores and social support.

## **Recommendations**

The following recommendations were drawn from the results of this study as well as other published studies in the fields of obesity, steps, physical activity and nutrition. Each recommendation has implications for both funding entities and program providers interested in enabling long-term positive health outcomes for individuals.

### ***Create Programs Based on Evidence***

Many promising practices in obesity control are beginning to emerge in the literature. A recent report from the nationally appointed Task Force on Community Preventive Services reviewed all the literature on preventing and controlling overweight and obesity in school and worksite settings and identified those interventions showing the most promise<sup>71</sup>:

## Promising Practices

### School setting

- Include nutrition and physical activity components in combination
- Allot additional physical activity time in school
- Include non-competitive sports
- Reduce sedentary activities, especially TV viewing time

### Work setting

- Include both nutrition and physical activity components
- Use aerobic or strength training exercise prescription
- Train in behavioral techniques
- Provide self-directed materials
- Prescribe specific diets for individuals
- Provide group or supervised exercise

More specific recommendations for adult programming include the use of behavioral strategies such as planning, goal setting, self monitoring, stimulus control, cognitive restructuring, problem solving and relapse management.<sup>5, 6, 72</sup> Specific recommendations for adult interventions include prescribed physical activity for at least 30 minutes per day plus weight lifting or some other form of strength training.<sup>6</sup> Tailoring approaches based on the individual's specific interests, preferences and readiness to change is also recommended.<sup>72-74</sup>

For youth, additional promising program components include reducing consumption of carbonated beverages<sup>75</sup> and including parents or families in activities.<sup>72, 76</sup> Targeting interventions to upper elementary and middle school youth have been found to be the most helpful.<sup>77</sup>

The programs funded through the Initiative employed a number of these strategies, but many may have benefited from the incorporation of additional evidence-based interventions or more thorough implementation of these promising techniques.

Less is known about methods to sustain behavior change. It may be that the skills required for weight maintenance are distinct from those required to achieve weight loss.<sup>72</sup> The role of the social and built environment might play a more essential role in maintenance than in short-term behavioral change.

### ***Aim at the Environment***

Over the past decade there has been a growing recognition of the role of the environment in influencing the obesity pandemic.<sup>40</sup> Many have argued that preventing obesity and overweight requires addressing this “obesogenic” environment and that environmental changes are likely to sustain behavior change better than interventions focused at the individual level.<sup>78</sup> In the late 1970s, the social learning theorist Albert Bandura argued that environmental attributes can be the overriding determinant in behavioral constraint.<sup>79</sup> A recent review of literature on environmental factors and physical activity has found multiple significant associations in the areas of accessibility to facilities, opportunities for physical activity and safety.<sup>80</sup>

This obesity prevention evaluation found that environmental factors such as access to ample produce and pedestrian friendly street plans were significantly associated with increases in physical activity. Future programming would benefit by adopting community planning and design features which focus on New Urbanism and Smart Growth. These features may have strong impacts not only on traffic, environmental quality, community safety and social capital, but also on the opportunities for physical activity.<sup>81-84</sup>

Educational and media campaigns, coupled with increased availability, could impact people's nutritional intake, ensuring an environment consistently conducive to a healthy lifestyle.

### ***Encourage Multi-level Interventions***

A study conducted by the National Academy of Sciences' Institute of Medicine (IOM) found that sustained health behavioral change was more successful when interventions focused on a number of levels: individual behavior, family interactions, relationships and resources in the community and workplace and public policy.<sup>85</sup> Additional research suggests that interventions that target multiple levels of the socio-ecologic model are the most likely to result in sustained behavior change.<sup>67-69</sup>

All of the interventions employed in this Initiative focused on the individual, with several aiming at organization-level changes, such as more nutritious cafeteria food or improved exercise equipment. Organizational changes were primarily aimed at schools, while those interventions either directly or indirectly targeting community change were conducted by multiple organizations simultaneously.

This study found that people largely perceived their social environments to be impediments to their own behavioral change. Community-based organizations may provide more effective programs if multiple tiers of the socio-ecologic model are addressed, including interventions aimed at the community and policy levels. Further, the formation of community coalitions with broad representation and an action orientation will help bring together the various stakeholders enhancing the ability to create changes along many paths of the community landscape.

### ***Emphasize Small Changes***

Qualitative results from this evaluation found that programming with a focus on small changes was important. The literature on behavior change suggests that "shaping," or the use of consecutive goals and rewards that move persons ahead in small increments, are the best way to reach a distant point.<sup>86</sup> In fact, the U.S. Government launched an education campaign with the Ad Council and National Institute of Health (NIH) educating Americans that they can "take small, achievable steps to improve their health and reverse the obesity epidemic."<sup>87</sup> Interventions seeking to change complex behaviors such as those involved in obesity should consider incorporating shaping strategies into programming.

One example of this "small changes" approach is the use of a step counter. Participants in this Initiative showed the largest levels of sustained change in the area of steps. Other published studies of pedometer use have also showed promising results.<sup>55, 56</sup> Steps requires few programming resources and can create long-term behavioral change.

Although the obesity literature promotes multi-faceted interventions as most effective,<sup>5, 6, 73, 88 89</sup> it may be that for improving individual outcomes of physical activity or steps, singularly focused interventions may be more effective. In addition, given limited resources and, in some cases, limited experience with multiple types of interventions, program providers may serve their communities better through focused, single-pronged, evidence-based interventions.

### ***Develop Programs with Stronger Dosages***

Changing individual behavior is difficult, particularly in areas related to physical activity, nutrition and weight.<sup>90</sup> Maintaining behavioral changes over time is even more difficult to accomplish.

The modest gains and waning effect of the interventions found at follow-up in this study suggest that participants may have benefited from a stronger dosage of the program. In fact, interventions found to be effective in obesity prevention and nutrition often require a more significant dose than that offered by many of the Initiative programs. Longer, more intensive interventions with follow-up are necessary to achieve long-term behavior changes and better health outcomes.<sup>85</sup> Interventions might benefit by being administered more as a time-release capsule, spanning months or even years and offering occasional booster shots through telephone calls, emails, flyers and additional meetings. Programs that also alter the physical or social environment, such as creating a new exercise facility or including whole families in an intervention, may serve to sustain follow-up behavior.

### ***Target Children and Adolescents***

Several studies point to the fact that youth in the U.S. are becoming increasingly unhealthy. The rates of obesity and overweight are increasing in youth and associated diseases formerly found only in adults (e.g., hypertension, Type 2 diabetes, hyperlipidemia) are more frequently appearing in children and adolescents.<sup>89</sup> Long-term studies show that obese children tend to become obese adults.<sup>78</sup> More evidence is needed to determine the effectiveness of school-based programs;<sup>91</sup> however, in a recent review of the literature on obesity and overweight interventions with children and youth, a majority were found to be effective.<sup>78</sup> Prevention and treatment of obesity may be easier in children because they are still growing in height and can often lose fat without dieting and, thus, may not require the more drastic behavioral changes often required with adults.<sup>78</sup>

The results from this study confirm this premise as youth made the largest gains in both physical activity and daily steps. (BMI could not be compared because BMI data were not analyzed for youth in this study.)

### ***Determine Optimal Level of Community Readiness***

This study found that residents living in healthier communities were more likely to make and sustain behavioral changes. The prevention literature speaks to the importance of intervention timing.<sup>92</sup> It may be that communities vary in their levels of readiness to address health-related behavior changes. Further, there may be key learning times in every community where health issues or issues of weight and exercise become more meaningful to residents. For instance, a community's readiness might peak post-holidays or when the weather is optimal for walking and exercise. Obesity-related programs can take advantage of these key teaching times.

### ***Tailor Programs to Meet Participant Needs***

The rates of overweight and obesity, sedentary behavior and related chronic diseases are not distributed equally in the population. Income, education, culture, personal life circumstances and presence of disability have been associated with the prevalence of these health states.<sup>93</sup> For example, Hispanic and African-American residents in Colorado experience higher rates of

overweight, obesity and Type 2 Diabetes than do Caucasian residents.<sup>94</sup> Community strategies should be “tailored” to best match the needs and lifestyles of target populations.

This evaluation found that programs that tailored strategies based on participants showed greater success in the area of fruit and vegetable consumption. Tailoring to relative health risk, readiness to change or program preference (e.g., individual or group setting, didactic or skills-based classes) are some examples of customization that have improved individual long-term outcomes in other studies.<sup>27</sup>

### ***Consider the Setting***

School and workplace settings provide ample opportunities for nutrition and physical activity interventions because both are locations where adults and children spend a substantial amount of time, consume a substantial proportion of daily calories and are often “captive.”<sup>71</sup> Both types of settings may have existing facilities that support regular physical activity.<sup>71</sup> In this study, it was found that daily steps increased if the intervention was conducted in the workplace. For youth, participants and program staff thought that providing and teaching new types of physical activities in and out of school helped to improve youth physical activity levels.

### ***Promote Sustainable Programming***

The longer a program exists, the more participants it can serve. Sustainable programs are, therefore, more likely to influence a community’s health by affecting the environment in which people live and work. Sustainability can be achieved through incorporation of key program elements into the existing organizational programming.<sup>49, 50</sup> For these reasons and given the inevitability of staff turnover, programs may want to consider which healthy lifestyle program components can be incorporated into existing programming without necessarily securing additional funding resources. Tracking program data and conducting basic evaluations of participant outcomes can help determine which programs to continue.

### ***Focus on Prevention***

Traditionally, much of the interest in obesity and overweight has focused on treatment rather than prevention; however, it may be easier and less expensive to prevent community ills. A movement toward prevention will likely yield more long-term outcomes than will treatment. Interventions aimed at behaviors antecedent to overweight and obesity, focusing on children and youth, targeting general populations (not just high-risk individuals) and changing the built and social environment may prove the best strategies for Colorado to use to reverse the obesity incline. Given the direction of U.S. health statistics in the areas of obesity, nutrition and physical activity, prevention is more critical than ever.

Creating and funding programs that follow these recommendations could lend strength to future attempts at community-oriented behavioral change.

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## Appendices

### Appendix I: Respondent Characteristics by Evaluation Status

Tables 36 through 67 display comparisons of the characteristics of respondents by their evaluation status; that is, whether evaluation participants completed a survey at all 3 time frames (program start, end and follow-up). Only respondents who had completed a program-end survey were invited to complete the 1 year follow-up survey on the assumption that those who did not return a survey at program end had not completed the program; however, some program participants may have completed the program, but either chose not to fill out a survey at program end, or missed the opportunity to do so. These analyses were conducted to examine whether there were significant differences between respondents who did complete a survey at all 3 time frames and those who only completed a start or a start and end survey.

#### Comparison of Demographic Characteristics: Adult Participants

Table 36 Gender of adult program participants by evaluation status

What is your gender?	Percent of Participants		
	Who Completed a Start, End and Follow-up Survey	Who Only Completed a Start and End Survey	Who Only Completed a Program Start Survey <sup>†</sup>
Male	16.4%	25.1%	25.2%
Female	83.6%	74.9%	74.8%
Number of participants	N=324	N=275	N=563

\* $p < 0.05$ ; <sup>†</sup> $p < 0.01$ ; <sup>‡</sup> $p < 0.001$ , comparing to those who completed a start, end and follow-up survey, tested using chi-square.

Table 37 Ethnicity of adult program participants by evaluation status

Are you Hispanic or Latino?	Percent of Participants		
	Who Completed a Start, End and Follow-up Survey	Who Only Completed a Start and End Survey	Who Only Completed a Program Start Survey
Yes	6.0%	5.2%	9.6%
No	94.0%	94.8%	90.4%
Number of participants	N=317	N=271	N=551

\* $p < 0.05$ ; <sup>†</sup> $p < 0.01$ ; <sup>‡</sup> $p < 0.001$ , comparing to those who completed a start, end and follow-up survey, tested using chi-square.

Table 38 Race of adult program participants by evaluation status

Which one or more of the following would you say is your race?*	Percent of Participants		
	Who Completed a Start, End and Follow-up Survey	Who Only Completed a Start and End Survey	Who Only Completed a Program Start Survey
American Indian or Alaskan Native	2.5%	3.0%	3.4%
Asian	.6%	.0%	.7%
Black or African American	.6%	1.5%	.9%
Native Hawaiian or other Pacific Islander	.0%	.4%	.2%
White	94.3%	95.5%	91.8%
Other	6.3%	2.6%	5.8%
Number of participants	N=316	N=268	N=535

\*\* Percents may add to more than 100% as respondents could give more than one answer.

\* $p < 0.05$ ; <sup>†</sup> $p < 0.01$ ; <sup>‡</sup> $p < 0.001$ , comparing to those who completed a start, end and follow-up survey, tested using chi-square.

Table 39 Age of adult program participants by evaluation status

What is your age?	Percent of Participants		
	Who Completed a Start, End and Follow-up Survey	Who Only Completed a Start and End Survey <sup>‡</sup>	Who Only Completed a Program Start Survey <sup>‡</sup>
16-24	6.0%	15.8%	16.0%
25-34	19.2%	12.5%	19.1%
35-44	17.9%	11.0%	18.7%
45-54	23.9%	21.2%	21.0%
55-64	19.8%	19.0%	14.0%
65-74	11.9%	16.1%	7.6%
75+	1.3%	4.4%	3.6%
Number of participants	N=318	N=273	N=556

<sup>\*</sup>*p*<0.05; <sup>†</sup>*p*<0.01; <sup>‡</sup>*p*<0.001, comparing to those who completed a start, end and follow-up survey, tested using chi-square.

Table 40 Employment status of adult program participants by evaluation status

Please check the box that closest reflects your current employment status:**	Percent of Participants		
	Who Completed a Start, End and Follow-up Survey	Who Only Completed a Start and End Survey <sup>*</sup>	Who Only Completed a Program Start Survey
Employed for wages	67.9%	59.9%	64.3%
Self-employed	9.7%	7.7%	8.0%
Out of work	.6%	.7%	2.2%
Homemaker	8.2%	8.1%	7.1%
Student	2.8%	9.6%	8.2%
Retired	13.8%	18.8%	10.9%
Unable to work	.9%	.7%	3.3%
Other	3.1%	2.2%	2.7%
Volunteer work	1.9%	.0%	1.1%
Number of participants	N=318	N=272	N=549

\*\* Percents may add to more than 100% as respondents could give more than one answer.

<sup>\*</sup>*p*<0.05; <sup>†</sup>*p*<0.01; <sup>‡</sup>*p*<0.001, comparing to those who completed a start, end and follow-up survey, tested using chi-square.

Table 41 Activity levels of employed adult participants at work by evaluation status

When you are at work, which of the following best describes what you do? (Include all jobs)	Percent of Participants		
	Who Completed a Start, End and Follow-up Survey	Who Only Completed a Start and End Survey	Who Only Completed a Program Start Survey
Mostly sitting or standing	76.8%	77.9%	68.0%
Mostly walking	17.2%	12.9%	22.0%
Mostly heavy labor or physically demanding work	6.0%	9.2%	9.9%
Number of participants	N=233	N=163	N=363

<sup>\*</sup>*p*<0.05; <sup>†</sup>*p*<0.01; <sup>‡</sup>*p*<0.001, comparing to those who completed a start, end and follow-up survey, tested using chi-square.



## Comparison of Demographic Characteristics: Youth Participants

Table 42 Gender of youth program participants by evaluation status

What is your gender?	Percent of Participants		
	Who Completed a Start, End and Follow-up Survey	Who Only Completed a Start and End Survey	Who Only Completed a Program Start Survey
Male	21.1%	19.8%	25.2%
Female	78.9%	80.2%	74.8%
Number of participants	N=71	N=96	N=143

\* $p < 0.05$ ; † $p < 0.01$ ; ‡ $p < 0.001$ , comparing to those who completed a start, end and follow-up survey, tested using chi-square.

Table 43 Race of youth program participants by evaluation status

Which one or more of the following would you say is your race?*	Percent of Participants		
	Who Completed a Start, End and Follow-up Survey	Who Only Completed a Start and End Survey†	Who Only Completed a Program Start Survey†
Hispanic or Latino	9.9%	34.7%	23.6%
American Indian or Alaskan Native	7.0%	5.3%	4.3%
Asian	.0%	1.1%	2.9%
Black or African American	2.8%	4.2%	3.6%
Native Hawaiian or other Pacific Islander	.0%	1.1%	.0%
White	52.1%	27.4%	34.3%
Other	36.6%	29.5%	40.0%
Number of Respondents	N=71	N=95	N=140

\*\* Percents may add to more than 100% as respondents could give more than one answer.

\* $p < 0.05$ ; † $p < 0.01$ ; ‡ $p < 0.001$ , comparing to those who completed a start, end and follow-up survey, tested using chi-square.

Table 44 Age of youth program participants by evaluation status

What is your age?	Percent of Participants		
	Who Completed a Start, End and Follow-up Survey	Who Only Completed a Start and End Survey‡	Who Only Completed a Program Start Survey*
8 years old	19.7%	21.9%	13.7%
9 years old	15.5%	6.3%	11.5%
10 years old	15.5%	7.3%	10.8%
11 years old	8.5%	8.3%	15.1%
12 years old	23.9%	3.1%	11.5%
13 years old	2.8%	7.3%	8.6%
14 years old	4.2%	10.4%	7.2%
15 years old	1.4%	9.4%	6.5%
16 years old	8.5%	9.4%	5.8%
17 years old	.0%	10.4%	6.5%
18 years old or older	.0%	6.3%	2.9%
Number of participants	N=71	N=96	N=139

\* $p < 0.05$ ; † $p < 0.01$ ; ‡ $p < 0.001$ , comparing to those who completed a start, end and follow-up survey, tested using chi-square.

Table 45 Grade of youth program participants by evaluation status

What is your grade?	Percent of Participants		
	Who Completed a Start, End and Follow-up Survey	Who Only Completed a Start and End Survey <sup>†</sup>	Who Only Completed a Program Start Survey <sup>†</sup>
2nd grade	2.8%	2.1%	6.5%
3rd grade	25.4%	23.2%	13.0%
4th grade	9.9%	8.4%	18.1%
5th grade	25.4%	8.4%	10.1%
6th grade	12.7%	2.1%	12.3%
7th grade	8.5%	13.7%	9.4%
8th grade	2.8%	7.4%	11.6%
9th grade	4.2%	13.7%	5.8%
10th grade	1.4%	8.4%	5.8%
11th grade	7.0%	5.3%	2.2%
12th grade	.0%	7.4%	5.1%
<b>Number of participants</b>	<b>N=71</b>	<b>N=95</b>	<b>N=138</b>

\* $p < 0.05$ ; <sup>†</sup> $p < 0.01$ ; <sup>‡</sup> $p < 0.001$ , comparing to those who completed a start, end and follow-up survey, tested using chi-square.

### ***Comparison of Target Population, Self-reported Health Status, Readiness to Change and Perceived Program Impact***

Table 46 "Target" participants by evaluation status

Target participants	Percent of Participants		
	Who Completed a Start, End and Follow-up Survey	Who Only Completed a Start and End Survey <sup>†</sup>	Who Only Completed a Program Start Survey
Youth	18.0%	25.9%	20.3%
Adult	82.0%	74.1%	79.7%
<b>Number of participants</b>	<b>N=395</b>	<b>N=371</b>	<b>N=706</b>

\* $p < 0.05$ ; <sup>†</sup> $p < 0.01$ ; <sup>‡</sup> $p < 0.001$ , comparing to those who completed a start, end and follow-up survey, tested using chi-square.

Table 47 Program participants' self-reported health by evaluation status

Would you say your health is...	Percent of Participants		
	Who Completed a Start, End and Follow-up Survey	Who Only Completed a Start and End Survey	Who Only Completed a Program Start Survey
Poor	1.2%	1.8%	2.0%
Fair	10.8%	11.7%	16.2%
Good	48.9%	47.8%	43.8%
Very Good	28.8%	28.8%	28.8%
Excellent	10.2%	9.9%	9.2%
<b>Number of participants</b>	<b>N=323</b>	<b>N=274</b>	<b>N=555</b>

\* $p < 0.05$ ; <sup>†</sup> $p < 0.01$ ; <sup>‡</sup> $p < 0.001$ , comparing to those who completed a start, end and follow-up survey, tested using chi-square.

Table 48: Physical activity readiness to change by evaluation status

Physical activity readiness to change	Percent of Participants		
	Who Completed a Start, End and Follow-up Survey	Who Only Completed a Start and End Survey	Who Only Completed a Program Start Survey
Maintenance	40.1%	37.8%	39.4%
Action	18.3%	25.0%	22.1%
Preparation	29.6%	25.0%	27.0%
Contemplation	10.2%	10.3%	9.1%
Precontemplation	1.8%	1.9%	2.4%
Number of participants	N=382	N=360	N=678

\* $p < 0.05$ ; † $p < 0.01$ ; ‡ $p < 0.001$ , comparing to those who completed a start, end and follow-up survey, tested using chi-square.

Table 49: Fruit and vegetable consumption readiness to change by evaluation status

Fruit and vegetable consumption readiness to change	Percent of Participants		
	Who Completed a Start, End and Follow-up Survey	Who Only Completed a Start and End Survey	Who Only Completed a Program Start Survey*
Maintenance	31.2%	33.2%	23.8%
Action	9.6%	11.5%	13.6%
Preparation	35.3%	35.2%	34.9%
Contemplation	16.4%	12.9%	17.6%
Precontemplation	7.5%	7.1%	10.2%
Number of participants	N=385	N=364	N=677

\* $p < 0.05$ ; † $p < 0.01$ ; ‡ $p < 0.001$ , comparing to those who completed a start, end and follow-up survey, tested using chi-square.

Table 50: Weight loss readiness to change by evaluation status

Weight loss readiness to change	Percent of Adult Participants		
	Who Completed a Start, End and Follow-up Survey	Who Only Completed a Start and End Survey*	Who Only Completed a Program Start Survey†
Maintenance	20.1%	30.5%	27.9%
Action	60.2%	49.6%	53.3%
Contemplation	13.6%	15.2%	9.3%
Precontemplation	6.1%	4.7%	9.5%
Number of participants	N=294	N=256	N=527

\* $p < 0.05$ ; † $p < 0.01$ ; ‡ $p < 0.001$ , comparing to those who completed a start, end and follow-up survey, tested using chi-square.

Table 51: Perceived impact of program on physical activity by evaluation status

Would you say because you participated in the program you are . . .	Percent of Participants	
	Who Completed a Start, End and Follow-up Survey	Who Only Completed a Start and End Survey
Less physically active	.6%	.9%
About the same as before	31.4%	28.9%
Somewhat more physically active	48.5%	48.2%
Much more physically active	19.6%	21.9%
Number of participants	N=363	N=342

\* $p < 0.05$ ; † $p < 0.01$ ; ‡ $p < 0.001$ , comparing to those who completed a start, end and follow-up survey, tested using chi-square.

Table 52: Perceived impact of program on fruit and vegetable consumption by evaluation status

Would you say because you participated in the program you . . .	Percent of Participants	
	Who Completed a Start, End and Follow-up Survey*	Who Only Completed a Start and End Survey
Eat 5 fruits and vegetables a day less often	3.4%	3.7%
Eat fruits and vegetables about the same as before	42.8%	30.8%
Eat 5 fruits and vegetables a day somewhat more often	36.1%	40.1%
Eat 5 fruits and vegetables a day much more often	17.7%	25.4%
Number of participants	N=327	N=299

\* $p < 0.05$ ; † $p < 0.01$ ; ‡ $p < 0.001$ , comparing to those who completed a start, end and follow-up survey, tested using chi-square.

Table 53: Perceived impact of program on weight by evaluation status

Would you say because you participated in the program you have . . .	Percent of Adult Participants	
	Who Completed a Start, End and Follow-up Survey	Who Only Completed a Start and End Survey
Gained weight	5.7%	4.6%
Stayed the same weight	61.2%	62.9%
Lost weight	33.1%	32.5%
Number of participants	N=281	N=237

\* $p < 0.05$ ; † $p < 0.01$ ; ‡ $p < 0.001$ , comparing to those who completed a start, end and follow-up survey, tested using chi-square.

Table 54: Perceived force of impact of program on physical activity by evaluation status

If you are more physically active now than before you started the program, how much do you think the program helped to increase your physical activity?	Percent of Participants	
	Who Completed a Start, End and Follow-up Survey	Who Only Completed a Start and End Survey
did not help at all	4.5%	2.4%
helped a little	40.8%	42.2%
helped a lot	54.8%	55.4%
Number of participants	N=292	N=287

\* $p < 0.05$ ; † $p < 0.01$ ; ‡ $p < 0.001$ , comparing to those who completed a start, end and follow-up survey, tested using chi-square.

Table 55: Perceived force of impact of program on fruit and vegetable consumption by evaluation status

If you are more often eating at least 5 fruits and vegetables a day now more than before you started the program, how much do you think the program helped to increase your fruits and vegetables consumption?	Percent of Participants	
	Who Completed a Start, End and Follow-up Survey	Who Only Completed a Start and End Survey <sup>‡</sup>
did not help at all	12.9%	5.8%
helped a little	45.4%	34.9%
helped a lot	41.8%	59.3%
Number of participants	N=249	N=241

\* $p < 0.05$ ; † $p < 0.01$ ; ‡ $p < 0.001$ , comparing to those who completed a start, end and follow-up survey, tested using chi-square.

Table 56: Perceived force of impact of program on weight loss and maintenance by evaluation status

If you have lost weight since you started the program, how much do you think the program helped you to lose weight?	Percent of Adult Participants	
	Who Completed a Start, End and Follow-up Survey	Who Only Completed a Start and End Survey
did not help at all	4.4%	2.9%
helped a little	37.2%	30.4%
helped a lot	58.4%	66.7%
Number of participants	N=113	N=102

\* $p < 0.05$ ; <sup>†</sup> $p < 0.01$ ; <sup>‡</sup> $p < 0.001$ , comparing to those who completed a start, end and follow-up survey, tested using chi-square.

### Comparison of Start Levels of Outcomes of Interest: Physical Activity

Table 57 Moderate physical activity at program start of adult program participants by evaluation status

Number of days per week of moderate physical activity lasting 30 or more minutes	Who Completed a Start, End and Follow-up Survey	Who Only Completed a Start and End Survey*	Who Only Completed a Program Start Survey
Mean	2.15	2.58	2.15
Standard deviation	2.46	2.63	2.49
Number of participants	N=322	N=273	N=563

\* $p < 0.05$ ; <sup>†</sup> $p < 0.01$ ; <sup>‡</sup> $p < 0.001$ , comparing to those who completed a start, end and follow-up survey, tested using ANOVA.

Table 58 Vigorous physical activity at program start of adult program participants by evaluation status

Number of days per week of vigorous physical activity lasting 20 or more minutes	Who Completed a Start, End and Follow-up Survey	Who Only Completed a Start and End Survey	Who Only Completed a Program Start Survey
Mean	1.55	1.68	1.60
Standard deviation	2.07	2.17	2.11
Number of participants	N=322	N=273	N=563

\* $p < 0.05$ ; <sup>†</sup> $p < 0.01$ ; <sup>‡</sup> $p < 0.001$ , comparing to those who completed a start, end and follow-up survey, tested using ANOVA.

Table 59 Moderate or vigorous physical activity at program start of adult program participants by evaluation status

Number of days per week of vigorous physical activity lasting 20 or more minutes	Who Completed a Start, End and Follow-up Survey	Who Only Completed a Start and End Survey	Who Only Completed a Program Start Survey
Mean	3.71	4.27	3.74
Standard deviation	3.72	4.11	3.83
Number of participants	N=322	N=273	N=563

\* $p < 0.05$ ; <sup>†</sup> $p < 0.01$ ; <sup>‡</sup> $p < 0.001$ , comparing to those who completed a start, end and follow-up survey, tested using ANOVA.

Table 60 Moderate physical activity at program start of youth program participants by evaluation status

Number of days per week of moderate physical activity lasting 30 or more minutes	Who Completed a Start, End and Follow-up Survey	Who Only Completed a Start and End Survey	Who Only Completed a Program Start Survey
Mean	3.35	3.46	3.28
Standard deviation	2.51	2.45	2.36
Number of participants	N=71	N=96	N=140

\* $p < 0.05$ ; † $p < 0.01$ ; ‡ $p < 0.001$ , comparing to those who completed a start, end and follow-up survey, tested using ANOVA.

Table 61 Vigorous physical activity at program start of youth program participants by evaluation status

Number of days per week of vigorous physical activity lasting 20 or more minutes	Who Completed a Start, End and Follow-up Survey	Who Only Completed a Start and End Survey	Who Only Completed a Program Start Survey
Mean	4.38	3.86	4.32
Standard deviation	2.01	2.16	2.21
Number of participants	N=71	N=96	N=142

\* $p < 0.05$ ; † $p < 0.01$ ; ‡ $p < 0.001$ , comparing to those who completed a start, end and follow-up survey, tested using ANOVA.

Table 62 Moderate or vigorous physical activity at program start of youth program participants by evaluation status

Number of days per week of vigorous physical activity lasting 20 or more minutes	Who Completed a Start, End and Follow-up Survey	Who Only Completed a Start and End Survey	Who Only Completed a Program Start Survey
Mean	7.73	7.32	7.56
Standard deviation	4.07	3.85	3.92
Number of participants	N=71	N=96	N=140

\* $p < 0.05$ ; † $p < 0.01$ ; ‡ $p < 0.001$ , comparing to those who completed a start, end and follow-up survey, tested using ANOVA.

### ***Comparison of Start Levels of Outcomes of Interest: Daily Steps***

Table 63 Daily steps at program start by evaluation status

Daily steps	Who Completed a Start, End and Follow-up Survey	Who Only Completed a Start and End Survey	Who Only Completed a Program Start Survey
Mean	7,698	7,134	7,850
Standard deviation	5,067	4,124	4,714
Number of participants	N=425	N=230	N=238

\* $p < 0.05$ ; † $p < 0.01$ ; ‡ $p < 0.001$ , comparing to those who completed a start, end and follow-up survey, tested using ANOVA.

### ***Comparison of Start Levels of Outcomes of Interest: Fruit and Vegetable Consumption***

Table 64 Fruit consumption at program start by evaluation status

Number of whole fruit servings per week	Who Completed a Start, End and Follow-up Survey	Who Only Completed a Start and End Survey	Who Only Completed a Program Start Survey
Mean	5.65	6.89	5.78
Standard deviation	6.10	6.65	5.57
Number of participants	N=189	N=103	N=105

\* $p < 0.05$ ; † $p < 0.01$ ; ‡ $p < 0.001$ , comparing to those who completed a start, end and follow-up survey, tested using ANOVA.

Table 65 Vegetable consumption at program start by evaluation status

Number of vegetable servings per week	Who Completed a Start, End and Follow-up Survey	Who Only Completed a Start and End Survey	Who Only Completed a Program Start Survey
Mean	10.11	9.55	11.56
Standard deviation	8.11	7.70	10.54
Number of participants	N=189	N=103	N=105

\* $p < 0.05$ ; <sup>†</sup> $p < 0.01$ ; <sup>‡</sup> $p < 0.001$ , comparing to those who completed a start, end and follow-up survey, tested using ANOVA.

Table 66 Fruit or vegetable consumption at program start by evaluation status

Number of whole fruit and vegetable servings per week	Who Completed a Start, End and Follow-up Survey	Who Only Completed a Start and End Survey	Who Only Completed a Program Start Survey
Mean	15.76	16.45	17.34
Standard deviation	11.63	12.19	14.64
Number of participants	N=189	N=103	N=105

\* $p < 0.05$ ; <sup>†</sup> $p < 0.01$ ; <sup>‡</sup> $p < 0.001$ , comparing to those who completed a start, end and follow-up survey, tested using ANOVA.

### ***Comparison of Start Levels of Outcomes of Interest: Adult BMI***

Table 67 Body Mass Index (BMI) at program start of adult program participants by evaluation status

Body Mass Index (BMI)	Who Completed a Start, End and Follow-up Survey	Who Only Completed a Start and End Survey	Who Only Completed a Program Start Survey
Mean	27.14	27.77	28.02
Standard deviation	6.01	7.23	6.77
Number of participants	N=301	N=262	N=528

\* $p < 0.05$ ; <sup>†</sup> $p < 0.01$ ; <sup>‡</sup> $p < 0.001$ , comparing to those who completed a start, end and follow-up survey, tested using ANOVA.

## Appendix II: Comparison of Changes in Outcomes Start to Follow up

Tables 68 through 74 compare the changes in the outcomes of interest from program start to follow-up among evaluation completers (those who completed a start, end and follow-up survey) and those who had not completed a program-end survey, but had completed a “non-completer follow-up survey.”

### *Comparison of Changes in Outcomes Start to Follow-up: Physical Activity*

Table 68 Change in levels of moderate physical activity of program participants from start to follow-up by evaluation status

	Evaluation Completer (Who Completed a Start, End and Follow-up Survey)			Evaluation Non-Completers (But Who Reported Completing a Program)			Evaluation Non-Completers (Who Reported Not Completing a Program)		
	Start	Follow-up	Change	Start	Follow-up	Change	Start	Follow-up	Change
Number of days per week of moderate physical activity lasting 30 or more minutes									
Mean	2.37	2.80	0.43	2.28	2.98	0.69	2.10	2.85	0.75
Standard deviation	2.51	2.55	3.06	2.58	2.47	3.31	2.44	2.73	3.09
95% confidence interval, lower bound	2.12	2.55	0.13	1.83	2.55	0.12	1.52	2.20	0.01
95% confidence interval, upper bound	2.62	3.05	0.73	2.73	3.41	1.27	2.68	3.50	1.49
Number of participants	N=393	N=393	N=393	N=127	N=127	N=127	N=68	N=68	N=68

\* $p < 0.05$ ; † $p < 0.01$ ; ‡ $p < 0.001$ , comparing change score to evaluation completers' change score, tested using ANOVA.

Table 69 Change in levels of vigorous physical activity of program participants from start to follow-up by evaluation status

	Evaluation Completer (Who Completed a Start, End and Follow-up Survey)			Evaluation Non-Completers (But Who Reported Completing a Program)			Evaluation Non-Completers (Who Reported Not Completing a Program)		
	Start	Follow-up	Change	Start <sup>†</sup>	Follow-up <sup>*</sup>	Change	Start <sup>†</sup>	Follow-up <sup>*</sup>	Change
Number of days per week of vigorous physical activity lasting 20 or more minutes									
Mean	2.06	2.35	0.28	1.39	1.80	0.41	1.46	1.87	0.41
Standard deviation	2.32	2.36	2.54	2.15	2.13	2.47	1.90	2.22	2.17
95% confidence interval, lower bound	1.83	2.11	0.03	1.02	1.43	-0.02	1.01	1.34	-0.10
95% confidence interval, upper bound	2.29	2.58	0.54	1.77	2.17	0.84	1.91	2.39	0.93
Number of participants	N=393	N=393	N=393	N=127	N=127	N=127	N=68	N=68	N=68

\* $p < 0.05$ ; † $p < 0.01$ ; ‡ $p < 0.001$ , comparing change score to evaluation completers' change score, tested using ANOVA.



Table 70 Change in levels of physical activity of program participants from start to follow-up by evaluation status

	Evaluation Completer (Who Completed a Start, End and Follow-up Survey)			Evaluation Non-Completers (But Who Reported Completing a Program)			Evaluation Non-Completers (Who Reported Not Completing a Program)		
	Start	Follow-up	Change	Start	Follow-up	Change	Start	Follow-up	Change
Number of days per week of moderate physical activity lasting 30 or more minutes or vigorous physical activity lasting 20 or more minutes									
Mean	4.43	5.15	0.72	3.68	4.78	1.10	3.56	4.72	1.16
Standard deviation	4.09	4.18	4.52	3.74	3.75	4.29	3.32	3.69	3.45
95% confidence interval, lower bound	4.03	4.74	0.27	3.03	4.13	0.36	2.77	3.84	0.34
95% confidence interval, upper bound	4.84	5.56	1.16	4.33	5.43	1.85	4.35	5.60	1.98
Number of participants	N=393	N=393	N=393	N=127	N=127	N=127	N=68	N=68	N=68

\* $p < 0.05$ ; <sup>†</sup> $p < 0.01$ ; <sup>‡</sup> $p < 0.001$ , comparing change score to evaluation completers' change score, tested using ANOVA.

### Comparison of Changes in Outcomes Start to Follow-up: Fruit and Vegetable Consumption

Table 71 Change in fruit consumption of program participants from start to follow-up by evaluation status

	Evaluation Completer (Who Completed a Start, End and Follow-up Survey)			Evaluation Non-Completers (But Who Reported Completing a Program)			Evaluation Non-Completers (Who Reported Not Completing a Program)		
	Start	Follow-up	Change	Start	Follow-up	Change	Start	Follow-up	Change
Number of whole fruit servings per week									
Mean	5.78	6.70	0.92	3.67	6.67	3.00	8.50	6.17	-2.33
Standard deviation	5.57	5.65	5.33	2.31	4.56	4.62	9.36	7.79	8.49
95% confidence interval, lower bound	4.72	5.62	-0.10	2.68	4.71	1.03	3.21	1.76	-7.14
95% confidence interval, upper bound	6.85	7.79	1.94	4.65	8.62	4.97	13.79	10.57	2.47
Number of participants	N=105	N=105	N=105	N=21	N=21	N=21	N=12	N=12	N=12

\* $p < 0.05$ ; <sup>†</sup> $p < 0.01$ ; <sup>‡</sup> $p < 0.001$ , comparing change score to evaluation completers' change score, tested using ANOVA.

Table 72 Change in vegetable consumption of program participants from start to follow-up by evaluation status

	Evaluation Completer (Who Completed a Start, End and Follow-up Survey)			Evaluation Non-Completers (But Who Reported Completing a Program)			Evaluation Non-Completers (Who Reported Not Completing a Program)		
	Start	Follow-up	Change	Start	Follow-up	Change	Start	Follow-up	Change
Number of vegetable servings per week									
Mean	11.56	9.92	-1.64	11.90	11.33	-0.57	16.00	11.08	-4.92
Standard deviation	10.54	5.92	9.19	7.78	6.03	7.12	8.80	7.12	7.44
95% confidence interval, lower bound	9.55	8.79	-3.40	8.58	8.76	-3.62	11.02	7.06	-9.13
95% confidence interval, upper bound	13.58	11.06	0.12	15.23	13.91	2.47	20.98	15.11	-0.71
Number of participants	N=105	N=105	N=105	N=21	N=21	N=21	N=12	N=12	N=12

\* $p < 0.05$ ; <sup>†</sup> $p < 0.01$ ; <sup>‡</sup> $p < 0.001$ , comparing change score to evaluation completers' change score, tested using ANOVA.

Table 73 Change in total fruit and vegetable consumption of program participants from start to follow-up by evaluation status

	Evaluation Completer (Who Completed a Start, End and Follow-up Survey)			Evaluation Non-Completers (But Who Reported Completing a Program)			Evaluation Non-Completers (Who Reported Not Completing a Program)		
	Start	Follow-up	Change	Start	Follow-up	Change	Start	Follow-up	Change
Number of whole fruit and vegetable servings per week									
Mean	17.34	16.63	-0.71	15.57	18.00	2.43	24.50	17.25	-7.25
Standard deviation	14.64	10.04	11.99	7.67	8.99	10.27	16.46	14.37	13.65
95% confidence interval, lower bound	14.54	14.71	-3.01	12.29	14.15	-1.96	15.19	9.12	-14.97
95% confidence interval, upper bound	20.14	18.55	1.58	18.85	21.85	6.82	33.81	25.38	0.47
Number of participants	N=105	N=105	N=105	N=21	N=21	N=21	N=12	N=12	N=12

\* $p < 0.05$ ; † $p < 0.01$ ; ‡ $p < 0.001$ , comparing change score to evaluation completers' change score, tested using ANOVA.

### Comparison of Changes in Outcomes Start to Follow-up: Adult BMI

Table 74 Change in body mass index of adult program participants from start to follow-up by evaluation status

	Change from Start to Follow-up								
	Evaluation Completer (Who Completed a Start, End and Follow-up Survey)			Evaluation Non-Completers (But Who Reported Completing a Program)			Evaluation Non-Completers (Who Reported Not Completing a Program)		
Body Mass Index (BMI)	Start	Follow-up	Change	Start	Follow-up	Change	Start	Follow-up	Change
Mean	27.19	27.00	-0.19	27.69	27.30	-0.39	27.59	27.77	0.18
Standard deviation	6.04	6.37	2.62	6.32	5.70	2.26	7.65	7.81	2.75
95% confidence interval, lower bound	26.50	26.27	-0.49	26.53	26.25	-0.81	25.64	25.78	-0.52
95% confidence interval, upper bound	27.89	27.73	0.11	28.85	28.35	0.02	29.54	29.76	0.88
Number of participants	N=292	N=292	N=292	N=114	N=114	N=114	N=59	N=59	N=59

\* $p < 0.05$ ; † $p < 0.01$ ; ‡ $p < 0.001$ , comparing change score to evaluation completers' change score, tested using ANOVA.

### Appendix III: Comparison of Program Completers and Non-completers

Tables 75 through 103 display comparisons of respondent demographics and start levels of the outcomes of interest by whether or not the respondent had completed a program. Respondents were classified as having completed a program if they had filled out both a program start and a program end survey. In addition, those who completed a “non-completer follow-up survey” and indicated on that survey that they had completed the program in which they had enrolled were considered “program completers.” Those who indicated on the non-completer follow-up survey that indeed they had not finished the program in which they had enrolled were considered “non-completers.”

#### Comparison of Demographic Characteristics: Adult Participants

Table 75: Gender of adult program participants by program completion status

What is your gender?*	Percent of Participants	
	Who Completed a Program	Who Did NOT Complete a Program
Male	18.5%	9.3%
Female	81.5%	90.7%
Number of participants	N=753	N=108

\* $p < 0.05$ ; † $p < 0.01$ ; ‡ $p < 0.001$ , tested using chi-square.

Table 76 Ethnicity of adult program participants by program completion status

Are you Hispanic or Latino?	Percent of Participants	
	Who Completed a Program	Who Did NOT Complete a Program
Yes	5.4%	4.8%
No	94.6%	95.2%
Number of participants	N=664	N=62

\* $p < 0.05$ ; † $p < 0.01$ ; ‡ $p < 0.001$ , tested using chi-square.

Table 77 Race of adult program participants by program completion status

Which one or more of the following would you say is your race?	Percent of Participants**	
	Who Completed a Program	Who Did NOT Complete a Program
American Indian or Alaskan Native	2.4%	1.6%
Asian	.5%	.0%
Black or African American	.9%	1.6%
Native Hawaiian or other Pacific Islander	.2%	.0%
White	94.9%	95.2%
Other	4.7%	1.6%
Number of participants	N=661	N=63

\*\* Percents may add to more than 100% as respondents could give more than one answer.

\* $p < 0.05$ ; † $p < 0.01$ ; ‡ $p < 0.001$ , tested using chi-square.

Table 78 Age of adult program participants by program completion status

What is your age?†	Percent of Participants	
	Who Completed a Program	Who Did NOT Complete a Program
16-24	9.6%	13.8%
25-34	16.8%	29.2%
35-44	15.4%	21.5%
45-54	22.6%	24.6%
55-64	19.8%	9.2%
65-74	13.5%	1.5%
75+	2.4%	.0%
Number of participants	N=668	N=65

\* $p < 0.05$ ; † $p < 0.01$ ; ‡ $p < 0.001$ , tested using chi-square.

Table 79 Employment status of adult program participants by program completion status

Please check the box that closest reflects your current employment status:‡	Percent of Participants**	
	Who Completed a Program	Who Did NOT Complete a Program
Employed for wages	64.3%	67.2%
Self-employed	9.4%	6.3%
Out of work	.6%	.0%
Homemaker	7.8%	12.5%
Student	4.9%	9.4%
Retired	15.7%	4.7%
Unable to work	1.3%	1.6%
Other	2.4%	1.6%
Volunteer work	1.3%	.0%
Number of participants	N=667	N=64

\*\* Percents may add to more than 100% as respondents could give more than one answer.

\* $p < 0.05$ ; † $p < 0.01$ ; ‡ $p < 0.001$ , tested using chi-square.

Table 80 Activity levels of employed adult participants at work by program completion status

When you are at work, which of the following best describes what you do? (Include all jobs)	Percent of Participants	
	Who Completed a Program	Who Did NOT Complete a Program
Mostly sitting or standing	77.2%	75.0%
Mostly walking	16.1%	22.7%
Mostly heavy labor or physically demanding work	6.7%	2.3%
Number of participants	N=447	N=44

\* $p < 0.05$ ; † $p < 0.01$ ; ‡ $p < 0.001$ , tested using chi-square.

## Comparison of Demographic Characteristics: Youth Participants

Table 81 Gender of youth program participants by program completion status

What is your gender?	Percent of Participants	
	Who Completed a Program	Who Did NOT Complete a Program
Male	20.2%	20.0%
Female	79.8%	80.0%
Number of participants	N=188	N=5

\* $p < 0.05$ ; † $p < 0.01$ ; ‡ $p < 0.001$ , tested using chi-square.

Table 82 Race of youth program participants by program completion status

Which one or more of the following would you say is your race?	Percent of Participants**	
	Who Completed a Program	Who Did NOT Complete a Program
Hispanic or Latino <sup>‡</sup>	23.8%	.0%
American Indian or Alaskan Native	5.5%	.0%
Asian	1.1%	.0%
Black or African American	3.3%	.0%
Native Hawaiian or other Pacific Islander	.0%	33.3%
White	40.3%	66.7%
Other	32.0%	.0%
Number of Respondents	N=181	N=3

\*\* Percents may add to more than 100% as respondents could give more than one answer.

\* $p < 0.05$ ; † $p < 0.01$ ; ‡ $p < 0.001$ , tested using chi-square.

Table 83 Age of youth program participants by program completion status

What is your age?	Percent of Participants	
	Who Completed a Program	Who Did NOT Complete a Program
8 years old	20.3%	50.0%
9 years old	12.1%	.0%
10 years old	9.9%	.0%
11 years old	8.2%	.0%
12 years old	11.5%	.0%
13 years old	7.7%	50.0%
14 years old	7.1%	.0%
15 years old	6.0%	.0%
16 years old	8.2%	.0%
17 years old	5.5%	.0%
18 years old or older	3.3%	.0%
Number of participants	N=182	N=2

\* $p < 0.05$ ; † $p < 0.01$ ; ‡ $p < 0.001$ , tested using chi-square.

Table 84 Grade of youth program participants by program completion status

What is your grade?	Percent of Participants	
	Who Completed a Program	Who Did NOT Complete a Program
2nd grade	2.2%	.0%
3rd grade	24.6%	50.0%
4th grade	10.1%	.0%
5th grade	14.5%	.0%
6th grade	6.7%	.0%
7th grade	11.2%	.0%
8th grade	6.7%	50.0%
9th grade	9.5%	.0%
10th grade	5.0%	.0%
11th grade	5.6%	.0%
12th grade	3.9%	.0%
Number of participants	N=179	N=2

\* $p < 0.05$ ; † $p < 0.01$ ; ‡ $p < 0.001$ , tested using chi-square.

***Comparison of Target Population, Self-reported Health Status, Readiness to Change and Perceived Program Impact***

Table 85 “Target” participants by program completion status

Target population <sup>‡</sup>	Percent of Participants	
	Who Completed a Program	Who Did NOT Complete a Program
Youth	20.0%	4.4%
Adult	80.0%	95.6%
Number of participants	N=941	N=113

\* $p < 0.05$ ; † $p < 0.01$ ; ‡ $p < 0.001$ , tested using chi-square.

Table 86 Program participants’ self-reported health by program completion status

Would you say your health is...	Percent of Participants	
	Who Completed a Program	Who Did NOT Complete a Program
Poor	1.6%	1.5%
Fair	12.6%	7.6%
Good	47.6%	56.1%
Very Good	28.5%	25.8%
Excellent	9.6%	9.1%
Number of participants	N=674	N=66

\* $p < 0.05$ ; † $p < 0.01$ ; ‡ $p < 0.001$ , tested using chi-square.

Table 87: Physical activity readiness to change by program completion status

Physical activity readiness to change	Percent of Participants	
	Who Completed a Program	Who Did NOT Complete a Program
Maintenance	38.1%	40.3%
Action	21.5%	25.4%
Preparation	27.8%	23.9%
Contemplation	10.6%	10.4%
Precontemplation	2.0%	.0%
Number of participants	N=834	N=67

\* $p < 0.05$ ; † $p < 0.01$ ; ‡ $p < 0.001$ , tested using chi-square.

Table 88: Fruit and vegetable consumption readiness to change by program completion status

Fruit and vegetable consumption readiness to change	Percent of Participants	
	Who Completed a Program	Who Did NOT Complete a Program
Maintenance	30.8%	33.8%
Action	10.6%	14.7%
Preparation	35.4%	29.4%
Contemplation	15.4%	17.6%
Precontemplation	7.8%	4.4%
Number of participants	N=842	N=68

\* $p < 0.05$ ; † $p < 0.01$ ; ‡ $p < 0.001$ , tested using chi-square.

Table 89: Weight loss readiness to change by program completion status

Weight loss readiness to change	Percent of Adult Participants	
	Who Completed a Program	Who Did NOT Complete a Program
Maintenance	25.3%	18.0%
Action	55.3%	62.3%
Contemplation	13.8%	8.2%
Precontemplation	5.6%	11.5%
Number of participants	N=624	N=61

\* $p < 0.05$ ; † $p < 0.01$ ; ‡ $p < 0.001$ , tested using chi-square.

### ***Comparison of Start Levels of Outcomes of Interest: Physical Activity***

Table 90 Moderate physical activity at program start of adult program participants by program completion status

Number of days per week of moderate physical activity lasting 30 or more minutes	Who Completed a Program	Who Did NOT Complete a Program
Mean	2.32	2.12
Standard deviation	2.54	2.46
Number of participants	N=673	N=67

*\*p<0.05; †p<0.01; ‡p<0.001, tested using ANOVA.*

Table 91 Vigorous physical activity at program start of adult program participants by program completion status

Number of days per week of vigorous physical activity lasting 20 or more minutes	Who Completed a Program	Who Did NOT Complete a Program
Mean	1.60	1.45
Standard deviation	2.13	1.91
Number of participants	N=673	N=67

*\*p<0.05; †p<0.01; ‡p<0.001, tested using ANOVA.*

Table 92 Moderate or vigorous physical activity at program start of adult program participants by program completion status

Number of days per week of moderate physical activity lasting 30 or more minutes or vigorous physical activity lasting 20 or more minutes	Who Completed a Program	Who Did NOT Complete a Program
Mean	3.92	3.57
Standard deviation	3.88	3.34
Number of participants	N=673	N=67

*\*p<0.05; †p<0.01; ‡p<0.001, tested using ANOVA.*

Table 93 Moderate physical activity at program start of youth program participants by program completion status

Number of days per week of moderate physical activity lasting 30 or more minutes	Who Completed a Program	Who Did NOT Complete a Program
Mean	3.41	0.50
Standard deviation	2.44	0.71
Number of participants	N=182	N=2

*\*p<0.05; †p<0.01; ‡p<0.001, tested using ANOVA.*

Table 94 Vigorous physical activity at program start of youth program participants by program completion status

Number of days per week of vigorous physical activity lasting 20 or more minutes	Who Completed a Program	Who Did NOT Complete a Program
Mean	4.09	2.00
Standard deviation	2.13	0.00
Number of participants	N=182	N=2

*\*p<0.05; †p<0.01; ‡p<0.001, tested using ANOVA.*



Table 95 Moderate or vigorous physical activity at program start of youth program participants by program completion status

Number of days per week of moderate physical activity lasting 30 or more minutes or vigorous physical activity lasting 20 or more minutes	Who Completed a Program	Who Did NOT Complete a Program
Mean	7.49	2.50
Standard deviation	3.92	0.71
Number of participants	N=182	N=2

\* $p < 0.05$ ; † $p < 0.01$ ; ‡ $p < 0.001$ , tested using ANOVA.

Table 96 Moderate physical activity at program start of all program participants by program completion status

Number of days per week of moderate physical activity lasting 30 or more minutes	Who Completed a Program	Who Did NOT Complete a Program
Mean	2.55	2.07
Standard deviation	2.56	2.44
Number of participants	N=855	N=69

\* $p < 0.05$ ; † $p < 0.01$ ; ‡ $p < 0.001$ , tested using ANOVA.

Table 97 Vigorous physical activity at program start of all program participants by program completion status

Number of days per week of vigorous physical activity lasting 20 or more minutes*	Who Completed a Program	Who Did NOT Complete a Program
Mean	2.13	1.46
Standard deviation	2.36	1.88
Number of participants	N=855	N=69

\* $p < 0.05$ ; † $p < 0.01$ ; ‡ $p < 0.001$ , tested using ANOVA.

Table 98 Moderate or vigorous physical activity at program start of all program participants by program completion status

Number of days per week of moderate physical activity lasting 30 or more minutes or vigorous physical activity lasting 20 or more minutes	Who Completed a Program	Who Did NOT Complete a Program
Mean	4.68	3.54
Standard deviation	4.15	3.30
Number of participants	N=855	N=69

\* $p < 0.05$ ; † $p < 0.01$ ; ‡ $p < 0.001$ , tested using ANOVA.

### ***Comparison of Start Levels of Outcomes of Interest: Daily Steps***

Table 99 Daily steps at program start of program participants by program completion status

Daily steps	Who Completed a Program	Who Did NOT Complete a Program
Mean	7,719	7,953
Standard deviation	4,510	4,442
Number of participants	N=592	N=46

\* $p < 0.05$ ; † $p < 0.01$ ; ‡ $p < 0.001$ , tested using ANOVA.

### ***Comparison of Start Levels of Outcomes of Interest: Fruit and Vegetable Consumption***

Table 100 Fruit consumption at program start of program participants by program completion status

Number of whole fruit servings per week	Who Completed a Program	Who Did NOT Complete a Program
Mean	6.42	7.05
Standard deviation	5.97	6.81
Number of participants	N=584	N=56

*\*p<0.05; †p<0.01; ‡p<0.001, tested using ANOVA.*

Table 101 Vegetable consumption at program start of program participants by program completion status

Number of vegetable servings per week	Who Completed a Program	Who Did NOT Complete a Program
Mean	11.51	11.25
Standard deviation	7.49	7.77
Number of participants	N=584	N=56

*\*p<0.05; †p<0.01; ‡p<0.001, tested using ANOVA.*

Table 102 Fruit or vegetable consumption at program start of program participants by program completion status

Number of whole fruit and vegetable servings per week	Who Completed a Program	Who Did NOT Complete a Program
Mean	17.93	18.30
Standard deviation	11.47	12.06
Number of participants	N=584	N=56

*\*p<0.05; †p<0.01; ‡p<0.001, tested using ANOVA.*

### ***Comparison of Start Levels of Outcomes of Interest: Adult BMI***

Table 103 Body Mass Index (BMI) at program start of adult program participants by program completion status

Body Mass Index (BMI)	Who Completed a Program	Who Did NOT Complete a Program
Mean	27.51	27.54
Standard deviation	6.66	7.60
Number of participants	N=634	N=60

*\*p<0.05; †p<0.01; ‡p<0.001, tested using ANOVA.*

## Appendix IV: Respondent Ratings of Individual-level Factors

Many of the individual-level factors analyzed in this report were indices comprised of the average ratings given to a set of questions. The responses given to each item comprising these indices are displayed in this section.

Table 104: Perceived risk

In the last 2 years, have you, one of your close family members or one of your close friends been told that you/they have...	Percent of Participants Responding "Yes"		
	you	close family member	close friend
heart disease	4.2%	15.1%	9.0%
diabetes	3.6%	19.9%	9.0%
cancer	5.4%	20.5%	23.5%
Number of participants	N=166	N=166	N=166

Table 105: Start: Social Support: Family

During the last three months, how often did <u>your family</u> do each of the following?	never	rarely	sometimes	often	very often	N
Did physical activity with me	23.2%	14.4%	37.6%	16.0%	8.8%	N=181
Offered to do physical activity with me	26.5%	17.1%	29.3%	16.6%	10.5%	N=181
Gave me encouragement to do physical activity	14.5%	8.4%	29.6%	34.6%	12.8%	N=179
Changed their schedule so we could do physical activity together	41.3%	22.9%	21.8%	8.9%	5.0%	N=179
Gave me helpful reminders to do physical activity	38.3%	16.1%	23.9%	13.3%	8.3%	N=180
Encouraged me to eat fruits and vegetables	35.2%	21.8%	18.4%	15.1%	9.5%	N=179
Discussed my eating habits with me	40.0%	23.9%	21.1%	9.4%	5.6%	N=180
Reminded me to eat fruits and vegetables	45.0%	24.4%	11.7%	10.0%	8.9%	N=180
Offered me fruits and vegetables when I visit in their homes	23.2%	14.4%	37.6%	16.0%	8.8%	N=181

Table 106: Social Support: Friend

During the last three months, how often did <u>your friends</u> do each of the following?	never	rarely	sometimes	often	very often	N
Did physical activity with me	28.1%	21.1%	29.7%	11.9%	9.2%	N=185
Offered to do physical activity with me	31.4%	20.5%	26.5%	11.9%	9.7%	N=185
Gave me encouragement to do physical activity	30.6%	21.0%	25.8%	16.1%	6.5%	N=186
Changed their schedule so we could do physical activity together	49.7%	25.4%	14.1%	7.6%	3.2%	N=185
Gave me helpful reminders to do physical activity	51.6%	23.9%	13.6%	7.6%	3.3%	N=184
Encouraged me to eat fruits and vegetables	62.2%	24.3%	5.9%	6.5%	1.1%	N=185
Discussed my eating habits with me	58.4%	23.8%	11.9%	5.9%	.0%	N=185
Reminded me to eat fruits and vegetables	69.2%	17.8%	7.6%	3.8%	1.6%	N=185
Offered me fruits and vegetables when I visit in their homes	28.1%	21.1%	29.7%	11.9%	9.2%	N=185

Table 107: Start: Self-efficacy for physical activity

For each item, please mark how sure you are that you could perform physical activity in that situation.	I'm sure I cannot	2	Maybe I can	4	I'm sure I can	N
Engage in physical activity even though I am feeling sad or highly stressed	.6%	1.8%	16.9%	21.7%	59.0%	N=166
Stick to my physical activity program even when family or social life takes a lot of time	3.0%	10.8%	34.3%	25.9%	25.9%	N=166
Set aside time for regular physical activity	.0%	3.6%	19.3%	36.1%	41.0%	N=166

Table 108: Perceived neighborhood environment

Please check the box for the answer that best applies to you and your neighborhood.	strongly disagree	somewhat disagree	somewhat agree	strongly agree	N
There are many places to go within easy walking distance of my home.	19.8%	14.3%	26.7%	39.2%	N=329
It is easy to walk to places within my neighborhood. (The streets, sidewalks or paths connect to other places.)	14.4%	11.9%	26.0%	47.7%	N=327
There are sidewalks on most of the streets in my neighborhood.	33.0%	10.7%	14.7%	41.6%	N=327
The sidewalks in my neighborhood are well maintained (paved, even, and not a lot of cracks).	35.0%	14.1%	16.9%	34.1%	N=320
There are bicycle or pedestrian trails in or near my neighborhood that are easy to get to.	25.5%	14.2%	24.2%	36.1%	N=330
My neighborhood is pleasant to look at while walking; it is clean, and/or there are trees, views, and/or attractive buildings.	6.7%	13.1%	29.5%	50.8%	N=329
There is so much traffic along the streets in my neighborhood that it makes it difficult or unpleasant to walk.	48.3%	28.4%	18.7%	4.6%	N=327
The streets in my neighborhood are hilly or it is otherwise difficult to walk in my neighborhood.	51.4%	22.2%	19.8%	6.7%	N=329
It is safe to walk in or near my neighborhood.	2.7%	7.3%	27.1%	62.9%	N=329
My neighborhood streets are well lit at night.	28.7%	19.6%	34.6%	17.1%	N=321
The crime rate in my neighborhood makes it unsafe to go on walks during the day.	83.3%	11.8%	2.4%	2.4%	N=330
The crime rate in my neighborhood makes it unsafe to go on walks at night.	64.9%	20.1%	9.8%	5.2%	N=328

Table 109: Perceived access to good nutrition and physical activity

indicate whether each of these types of places are on a frequently traveled route (e.g., to and from work) or within a 5-minute drive or 10-minute walk from your work or home. Please check one answer for each item.	yes	no	don't know	N
a grocery store	65.5%	34.5%	.0%	N=330
a natural food store (e.g., Wild Oats, Whole Foods, Alfalfa's)	20.7%	76.5%	2.7%	N=328
a farmer's market (seasonal or year-round)	24.4%	73.8%	1.8%	N=328
a fast food restaurant	62.0%	37.4%	.6%	N=329
an all-you-can-eat buffet	19.3%	75.8%	4.9%	N=327
a convenience store (e.g., 7-11, gas station store)	74.8%	24.8%	.3%	N=322
health club/gym/aerobics studio or public recreation center	47.4%	50.8%	1.8%	N=329
walking/running/hiking trails	66.3%	31.6%	2.1%	N=329
biking trails	53.8%	43.5%	2.7%	N=329

Table 110 Access to fresh fruits and vegetables

How easy or difficult is it for you to get fresh produce (fruits and vegetables)?	Percent of Participants
very difficult	2.5%
somewhat difficult	12.7%
somewhat easy	31.9%
very easy	52.9%
Number of participants	N=401

Table 111 Average score for individual-level factors

Psycho-social factors	Mean	Std. Dev.	N
Self-reported Health Status (Possible Range 1 to 5)	3.36	0.86	N=333
Perceived Personal Risk (Possible Range 0 to 3)	0.13	0.43	N=166
Perceived Family Member Risk (Possible Range 0 to 3)	0.55	0.82	N=166
Perceived Friend Risk (Possible Range 0 to 3)	0.42	0.75	N=166
Perceived Total Risk (Possible Range 0 to 9)	1.10	1.37	N=166
Family Social Support for Physical Activity (Possible Range 1 to 5)	2.63	1.07	N=181
Friend Social Support for Physical Activity (Possible Range 1 to 5)	2.25	1.04	N=186
Family Social Support for Fruit and Vegetable Consumption (Possible Range 1 to 5)	2.24	1.19	N=180
Friend Social Support for Fruit and Vegetable Consumption (Possible Range 1 to 5)	1.69	0.81	N=185
Self-Efficacy for Physical Activity (Possible Range 1 to 5)	4.04	0.77	N=166
Perceived Neighborhood Environment (Possible Range 1 to 4)	2.44	0.49	N=331
Perceived Access to Good Nutrition (Possible Range 0 to 6)	2.53	0.89	N=330
Perceived Access to Physical Activity (Possible Range 0 to 3)	1.67	1.15	N=329
Perceived Access to Fruits & Vegetables (Possible Range 1 to 4)	3.35	0.80	N=401
Physical Activity Readiness to Change (Possible Range 1 to 5)	2.14	1.11	N=393
Fruit & Vegetable Readiness to Change (Possible Range 1 to 5)	2.60	1.28	N=396
Weight Loss Maintenance Readiness to Change (Possible Range 1 to 4)	2.19	1.11	N=330

## Appendix V: Average Score of Community-level Factors Assigned to Respondents

Depending on where they lived, participants were matched to community-level data for the analyses in this report. Table 112 displays the average score of the community-level factors assigned to respondents.

Table 112 Average score of each community characteristic that was assigned to respondents

Community Characteristic	Mean	Std. Dev.	N
Percent in community rating health as "excellent" or "good"	88%	5%	N=378
Percent in community who are overweight	51%	3%	N=378
Percent in community who are obese	15%	3%	N=378
Percent in community who engage in regular physical activity	83%	6%	N=378
Percent in community who eat 2 or more fruits per day	1%	4%	N=378
Percent in community who eat 3 or more vegetables per day	19%	18%	N=378
Percent of the population in the community living in a rural setting	12%	22%	N=347
Front Range (1=Front Range, 0=Mountains or Plains)	0.30	0.46	N=347
Average annual precipitation of community	14.62	1.84	N=348
Average temperature in January of community	26.25	4.00	N=348
Average temperature in July of community	69.78	5.29	N=348
Number of recreation facilities (parks, recreation centers, fields, golf courses, etc) per 1,000 population	2.20	1.53	N=348
Number of diet centers or weight loss clinics per 1,000 population	0.18	0.26	N=348
Number of food service vendors (restaurants, etc.) per 1,000 population	3.74	3.34	N=348
Number of fast food restaurants per 1,000 population	0.55	0.26	N=348
Number of buffet restaurants per 1,000 population	0.04	0.07	N=348
Number of places where can get produce per 1,000 population	1.31	3.50	N=348
Level of freshness (1=all 2=most 3=some fresh)	1.54	0.50	N=224
Availability of any organic produce (0=neither store, 1=1 store, 2=2 stores)	0.44	0.76	N=224
Produce section size and variety (product of size and variety)	3.74	3.02	N=224
Size of produce section (1=small, 2=medium, 3=large)	11.90	1.28	N=224
Variety in produce section (1=1-47 varieties, 2=64-101 varieties, 3=120+ varieties)	1.80	0.89	N=224
More than one store (0=1 store, 1=1+ stores)	1.75	0.85	N=224
Total varieties of fresh fruit and vegetable (total number of varieties)	0.45	0.50	N=224
Minimum price basket of fresh, frozen and canned produce	\$69.44	\$58.78	N=224
Total square feet of fresh fruit and vegetables	727	1037	N=224
Minimum price per 16 oz - of fresh fruits and vegetables basket	\$0.85	\$0.20	N=224
Average percent of streets with sidewalks, street lights, bike paths (1=0%, 2=1-24%, 3 25-49%, 4=50-74%, 5=75-95%, 6=100%)	30%	19%	N=352
Miles of unpaved & paved trails and bike lanes per 100,000 population	79	160	N=398
Miles of unpaved & paved trails and bike lanes	63	123	N=398
Presence facilities for alternate modes of transportation (0=none, 100=most)	49	24	N=352
Walkability index (0=least walkable, 10=most walkable)	6.33	1.10	N=224
Presence of ordinances/policies promoting healthy lifestyles (0=none, 100=most)	48	33	N=352
Presence of active health promotion in the community (0=none, 100=most)	50	33	N=352
Presence of barriers to outdoor physical activity (0=none, 100=most)	57	26	N=398

## Appendix VI: Average Score of Program-level Factors Assigned to Respondents

Participants were matched to the data for the program in which they had been enrolled. Tables 113 through 115 display the average score of the program-level factors assigned to respondents.

Table 113 Average score of program-level factors assigned to respondents

Program-level Factors	Mean	Std. Dev.	N
<i>Effective Program Components</i>			
Delivered program included an orientation (1=yes, 0=no)	0.57	0.50	N=398
Delivered program included skills-based learning and practice (1=yes, 0=no)	0.34	0.47	N=392
Delivered program included multiple components (1=yes, 0=no)	0.96	0.18	N=398
Delivered program included strategies for relapse prevention (1=yes, 0=no)	0.11	0.31	N=398
Delivered program included strategies for maintenance (1=yes, 0=no)	0.22	0.41	N=398
Contact intensity of delivered program (0=low, 0.5=medium, 1=high)	0.62	0.27	N=392
Tailoring Program for Participants Index (1=4 types, 0=no type of tailoring)	0.24	0.29	N=392
Delivered program included goal-setting (1=yes, 0=no)	0.56	0.50	N=392
Delivered program included self-monitoring (1=yes, 0=no)	0.83	0.38	N=392
Delivered program included support groups (1=yes, 0=no)	0.44	0.50	N=380
Delivered program included a coach (1=yes, 0=no)	0.52	0.50	N=380
Delivered program included incentives (1=yes, 0=no)	0.49	0.50	N=392
Program included a multi-organizational campaign (1=yes, 0=no)	0.20	0.40	N=392
Effectiveness Index (Average of Above Components)	0.47	0.18	N=398



Table 114 Average score of program-level factors assigned to respondents

Program-level Factors	Mean	Std. Dev.	N
<i>Levels of socio-ecological model addressed by program</i>	0.69	0.46	N=392
Interpersonal (1=yes, 0=no)	0.52	0.50	N=392
Organizational (1=yes, 0=no)	0.33	0.47	N=392
Community (1=yes, 0=no)	0.52	0.22	N=392
Total number of levels of SEM addressed (1=all 4 levels, including individual, 0.66=3 levels, 0.33=2 levels, 0=individual level only)	0.69	0.46	N=392
<i>Elements of social cognitive theory addressed</i>			
Knowledge (1=yes, 0=no)	0.65	0.48	N=392
Attitude (1=yes, 0=no)	0.27	0.45	N=392
Behavior (1=yes, 0=no)	0.85	0.35	N=392
<i>Other Program Factors</i>			
Ties to Community Index (1=most positive, 0=most negative)	0.60	0.22	N=398
Reach to Intended Population Index (1=most positive, 0=most negative)	0.33	0.19	N=398
Data Tracking Index (1=most positive, 0=most negative)	0.45	0.19	N=398
Program was delivered as intended (1=yes, .5=middle, 0=no)	0.51	0.20	N=398
Delivered (actual) program included effective components for behavior change (1=yes, 0=no)	0.94	0.24	N=398
Program Aimed at High-risk Individuals? (1=High-risk, 0=General Population)	0.22	0.42	N=398
Workplace Intervention? (1=Workplace, 0=Non-workplace)	0.30	0.46	N=398

Table 115: Percent of respondents in programs with specific characteristics

Program Profile Factors	Percent of Respondents				N of Respondents
	Coded "none"	Coded "low"	Coded "medium"	Coded "high"	
Degree to which physical activity was targeted	0.5%	0.0%	1.5%	98.0%	N=398
Degree to which increasing steps was targeted	9.5%	6.5%	12.6%	71.4%	N=398
Degree to which fruit and vegetable consumption was targeted	9.5%	17.6%	41.2%	31.7%	N=398
Degree to which weight loss or maintenance was targeted	54.8%	29.6%	15.6%	0.0%	N=398

## **Appendix VII: Program Descriptions**

Program characteristics were gathered from the grantees' final reports, from individual interviews with grantees, and from the regional coordinators' knowledge of grantees and their programs. This section briefly describes the program characteristics as observed through these data collection efforts.

Although there were 17 agencies or consortiums from Regions 1 and 5 that could be included in the evaluation, these 17 agencies provided 24 different programs. These grantees had different program outcome targets and audiences. In Region 1, where the focus area was increasing physical activity, the 9 grantees' concentrated primarily on nutrition and exercise. Only 2 programs did not consider improved nutrition their focus, and only 1 program did not consider exercise a main focus. Obesity prevention and weight loss and maintenance were considered targets by 3 programs. Two grantees included diabetes prevention as a focus.

Four Region 1 programs targeted everyone in their community as potential participants, and another 4 aimed their programming at youth. There was one workplace program and one program for seniors in Region 1. The programs tended to be 4 weeks or longer.

In Region 5, where the focus was diabetes prevention, all of the 8 grantees concentrated on nutrition and increased exercise (whether through a pedometer program or some other encouraged exercise). Seven grantees concentrated on diabetes prevention. Two of these programs were clinic-based.

Overall, 4 programs had at least one school-based component, and 2 were focused on the workplace. Two programs concentrated on seniors for all, or part, of their programming.

Although the programs were located in only 2 regions of the state, there were notable differences in their geographic settings that transcended region, such as rural or urban setting, availability of walking paths, availability of fresh produce.

There were many structural differences between the funded programs. Some were single community-based organizations, some were large collaboratives, some were Community Extension or clinic-based and had previous experience evaluating interventions. Leadership differed as well. Some were run by experienced interventionists, with staff onboard trained in health-related issues. Others were led by program managers or fiscal managers.

Programs ranged in duration from 2 weeks to 1 year, with many running from 10-16 weeks. Total number of participants ranged from 30s to 100s and is largely indeterminate, as "participant" was defined differently in different programs. For some, a participant was an individual who regularly attended classes, while for other programs, a participant was anyone who picked up a flier at a health fair.

### ***Program Components***

The components of these programs, in some cases, fluctuated over the course of the grant, as programs refined their target audiences, met with unforeseen limitations on what they could offer, or had staff turnover.

Most of the programs (15) provided participants with pedometers. For 9 of these, step logs were a companion component, and step goals were set. For many of the programs (13), lectures, or talks, were also a principal component. Many programs (11) also:

- gave people handouts, or packets, to bring home;
- offered incentives, such as fit balls, raffle prizes, and sweatshirts;
- and offered health screenings, including lipid profiles, cholesterol checks, glucose counts, etc.

About 9 programs had mentors or coordinators, a group setting or “buddies,” and an emphasis on sports in their activities.

Other program components, which were less common, included: nutrition screenings and logs, follow-up with participants, outdoor activities, cooking and serving size demonstrations, one-on-one meetings with clinicians or instructors, inspirational stories from people who had made lifestyle changes, and celebrations.

Tables 116 through 120 display the program characteristics as coded for the quantitative analyses in the section

*Program-level* Factors.

Table 116 Average score of program-level factors assigned to programs

Program-level Factors	Mean	Std. Dev.	N
<i>Effective Program Components</i>			
Delivered program included an orientation (1=yes, 0=no)	0.84	0.37	N=19
Delivered program included skills-based learning and practice (1=yes, 0=no)	0.56	0.51	N=18
Delivered program included multiple components (1=yes, 0=no)	0.89	0.32	N=19
Delivered program included strategies for relapse prevention (1=yes, 0=no)	0.16	0.37	N=19
Delivered program included strategies for maintenance (1=yes, 0=no)	0.26	0.45	N=19
Contact intensity of delivered program (0=low, 0.5=medium, 1=high)	0.73	0.27	N=17
Tailoring Program for Participants Index (1=4 types, 0=no type of tailoring)	0.38	0.29	N=18
Delivered program included goal-setting (1=yes, 0=no)	0.56	0.51	N=18
Delivered program included self-monitoring (1=yes, 0=no)	0.61	0.50	N=18
Delivered program included support groups (1=yes, 0=no)	0.53	0.51	N=17
Delivered program included a coach (1=yes, 0=no)	0.76	0.44	N=17
Delivered program included incentives (1=yes, 0=no)	0.33	0.49	N=18
Program included a multi-organizational campaign (1=yes, 0=no)	0.28	0.46	N=18
Effectiveness Index (Average of Above Components)	0.53	0.16	N=19

Table 117 Average score of program-level factors assigned to programs

Program-level Factors	Mean	Std. Dev.	N
<i>Levels of socio-ecological model addressed by program</i>			
Interpersonal (1=yes, 0=no)	0.67	0.49	N=18
Organizational (1=yes, 0=no)	0.50	0.51	N=18
Community (1=yes, 0=no)	0.39	0.50	N=18
Total number of levels of SEM addressed (1=all 4 levels, including individual, 0.66=3 levels, 0.33=2 levels, 0=individual level only)	0.52	0.31	N=18
<i>Elements of social cognitive theory addressed</i>			
Knowledge (1=yes, 0=no)	0.89	0.32	N=18
Attitude (1=yes, 0=no)	0.33	0.49	N=18
Behavior (1=yes, 0=no)	0.89	0.32	N=18
<i>Other Program Factors</i>			
Ties to Community Index (1=most positive, 0=most negative)	0.53	0.23	N=19
Reach to Intended Population Index (1=most positive, 0=most negative)	0.35	0.20	N=19
Data Tracking Index (1=most positive, 0=most negative)	0.54	0.19	N=19
Program was delivered as intended (1=yes, .5=middle, 0=no)	0.53	0.26	N=19
Delivered (actual) program included effective components for behavior change (1=yes, 0=no)	0.95	0.23	N=19
Program Aimed at High-risk Individuals? (1=High-risk, 0=General Population)	0.26	0.45	N=19
Workplace Intervention? (1=Workplace, 0=Non-workplace)	0.16	0.37	N=19

Table 118: Percent of programs with specific characteristics

Program Profile Factors	Percent of Programs				N of Programs
	Coded "none"	Coded "low"	Coded "medium"	Coded "high"	
Degree to which fruit and vegetable consumption was targeted	10.5%	21.1%	26.3%	42.1%	N=19
Degree to which physical activity was targeted	5.3%	0.0%	5.3%	89.5%	N=19
Degree to which increasing steps was targeted	26.3%	10.5%	21.1%	42.1%	N=19
Degree to which weight loss or maintenance was targeted	42.1%	31.6%	26.3%	0.0%	N=19

Table 119: Percent of programs with specific characteristics

Program-level Factors	Percent of Programs			
	Coded "Yes"	Coded "No"	N	
<i>Effective Program Components</i>				
Delivered program included an orientation	84.2%	15.8%	N=19	
Delivered program included skills-based learning and practice	55.6%	44.4%	N=18	
Delivered program included multiple components	89.5%	10.5%	N=19	
Delivered program included strategies for relapse prevention	15.8%	84.2%	N=19	
Delivered program included strategies for maintenance	26.3%	73.7%	N=19	
Delivered program included goal-setting	55.6%	44.4%	N=18	
Delivered program included self-monitoring	61.1%	38.9%	N=18	
Delivered program included support groups	52.9%	47.1%	N=17	
Delivered program included a coach	76.5%	23.5%	N=17	
Delivered program included incentives	33.3%	66.7%	N=18	
Program included a multi-organizational campaign	27.8%	72.2%	N=18	
<i>Levels of socio-ecological model addressed by program</i>				
Individual	100.0%	0.0%	N=18	
Interpersonal	66.7%	33.3%	N=18	
Organizational	50.0%	50.0%	N=18	
Community	38.9%	61.1%	N=18	
<i>Elements of social cognitive theory addressed</i>				
Knowledge	88.9%	11.1%	N=18	
Attitude	33.3%	66.7%	N=18	
Behavior	88.9%	11.1%	N=18	
<i>Other Program Factors</i>				
Delivered program included effective components for behavior change	94.7%	5.3%	N=19	
Program aimed at high-risk individuals?	26.3%	73.7%	N=19	
Worksite intervention?	15.8%	84.2%	N=19	
Program-level Factors	Low	Medium	High	N
Contact intensity of delivered program	23.5%	35.3%	41.2%	N=17
Program-level Factors	No	Middle	Yes	N
Program was delivered as intended	10.5%	73.7%	15.8%	N=19

Table 120: Percent of programs with specific characteristics

Program-level Factors	Percent of Programs		
	Coded "Yes"	Coded "No"	N
<i>"Ties to Community" Index Components</i>			
Program setting was representative of other similar settings in the community	57.9%	42.1%	N=19
Program staff was similar to population they serve	15.8%	84.2%	N=19
Program collaborated with other community programs in planning or delivering programs or services	84.2%	15.8%	N=19
<i>Reach to Intended Population Index Components</i>			
Target population was representative of community	36.8%	63.2%	N=19
Program participants were similar to target population	47.4%	52.6%	N=19
Recruitment strategies (yes=Active; no=Passive)	31.6%	68.4%	N=19
Program reached intended target - participation rates (yes: >= 75%, no: < 75%)	22.2%	77.8%	N=18
<i>Data Tracking Index Components</i>			
Extent of program drop-out (yes: >= 75%, no: < 75%)	11.8%	88.2%	N=17
Delivered program tracked program dropouts	72.2%	27.8%	N=18
Delivered program followed up with program drop-outs	15.8%	84.2%	N=19
Project collected information on program participants	89.5%	10.5%	N=19
Project collected information on program dropouts	52.6%	47.4%	N=19
Project collected information on behavior change	73.7%	26.3%	N=19
Project collected information to improve program	63.2%	36.8%	N=19
Percentage of participants who completed most (80%) of program	Mean=53.94	Std. Dev=22.34	N=18
<i>Tailoring Program for Participants Index Components</i>			
Tailored by readiness to change	22.2%	77.8%	N=18
Tailored by mode preference	61.1%	38.9%	N=18
Tailored by risk factors	27.8%	72.2%	N=18
Tailed by individual	41.2%	58.8%	N=17



## **Appendix VIII: Program Sustainability – Results of the Follow-up Program Staff Interviews**

This section contains the results of the program sustainability interviews, and any linkages between program characteristics and program sustainability.

### **Program Sustainability**

Given the relatively small amount of sustained change demonstrated in participants' follow-up surveys, and given the wide variety of programs funded under this Initiative, NRC and the expert panelists thought it would be beneficial to know which programs were able to sustain after Initiative funding ceased.

All of the program leaders who had been interviewed in 2005 were contacted again in August 2006 to schedule follow-up interviews. Fifteen staff completed structured telephone interviews of 15-35 minutes in length. The interview guide is included in Appendix IX: Instruments Used in the Evaluation.

### ***Program Self-ratings***

To begin the interview, each program leader was asked for subjective ratings of their general success and impact.

#### Program Success

The interviewer asked respondents to rate the success of their Initiative-funded program, the short-term impact on participants as well as the long-term impact. The scale used was Low, Medium, High. The subjective nature of these perspectives is evident in some of the reasons staff provided: One person simply considered their program's approach to the issues to be well-reasoned, while another thought their program was successful partly because it coincided with a larger media emphasis on healthy lifestyles.

Seven leaders rated their program's success as high. Their reasons included:

- Met general program goals they had set, including participation numbers (5)
- Made noticeable and sustainable changes to their pre-existent programming or created new programming elements that have been sustained (4)
- Made a difference in participants' lifestyles (3)

Six leaders rated their program's success as medium. Most focused on why they did not rate it as high, with 4 noting that they had missed their target participation goals.

Two leaders rated the program success as low. One believed that impact on participants had been low, while the other said the program structure and requirements did not fit the target population.

#### Participant Short-term Impact

Program leaders were asked to rate their program's short-term impact on program participants. Although one might expect a correlation between impact and program success, interviewees seemed to have had a harder time rating short-term impact than they did their program's success. Eight rated it high, 5 rated it medium, and 2 rated it as low. Among those who rated their short-term impact as high, 4 main reasons were given:

- Documented changes in participant behavior (6)
- Participants' level of involvement (4)
- Follow-up and other elements of program intensity(3)
- Changes in participant attitude or knowledge (3)

Those who rated short-term impact as medium or low generally believed they had made an impact, but acknowledged that they may have missed some target populations or impact goals.

### Participant Long-term Impact

Program leaders were asked to rate their program's long-term impact on participants. Interviewees had the hardest time with this rating. Lacking any data other than anecdotal, they inferred some degree of long-term impact on participants from individual stories they had heard and from knowing that all or some of their program was still active in the community. Most, however, assumed that the positive effects of their program had worn off partially, if not fully. The ratings were distributed as follows: High (2), Medium (8) and Low (5).

Despite difficulties rating their programs, leaders believed they understood which parts of their program instigated the most change in participants. These were:

- Creating an external reason for participants to respond to (i.e., accountability, guilt, incentives, responsibility to dogs) (6)
- Increasing participant knowledge and skills for life (5)
- Pedometer (5)
- Making activities fun and easy (4)
- Peer-to-peer teaching and Peer support (4)
- Timing (i.e., duration, repetition, and being in sync with media hype) (3)
- Food models and portion demonstrations (1)

Taken together, the various elements reflect some of the promising practices for health behavioral change programs. All of the elements program leaders mentioned were also deemed important by program participants.

### Retrospective Glance at Programs

Because all program leaders were interviewed after the Initiative funding had ended, they were in a position to think back on their program administration and consider what they might have done differently.

Of the 13 people who spoke about staffing, 11 had problems in this area. Typical comments were:

- "I feel like it would have been more successful if we'd had more staff."
- "The program itself could have used more staffing time allocated to it. And we didn't have a position that could focus, even primarily on this. It was always part of several other job responsibilities."
- "I do regret that we were unable to hold on to one coordinator for the entire piece. I think we went through five or six different people off and on. . . . And the program was just...well you do the best you can, but when your main job is doing something else, you really can't do this adequately. So that type of leadership was missing."

Twelve people spoke about funding, and all but 2 said it was adequate, even "generous." All were pleased with the fact that the funding was multi-year. One wanted help leveraging funding from national foundations for subsequent years, while another mentioned wanting to add a

nutrition component to their program. Two mentioned they could have used more funding for dedicated staff or more intensive marketing.

Eight leaders spoke about their organization's lack of planning prior to grant implementation. One thought it was typical of the way nonprofits respond to grant applications:

- "It's always the case with a lot of grants. I think you don't put as much planning, as you should up front. You just jump in with both feet and do the work so after the fact you go well...and you are saying now, after the fact, well we need to track better and so forth, but there is really nobody to walk you through that at the beginning."
- "I think if I were starting off a program like this, having just stronger planning for the future right off the bat."
- "So I think maybe getting out there and talking more with the people in the [target community] would have been helpful before we started the program."

Seven leaders reflected on collaborations they had been involved in for this grant. There were difficulties with uneven strengths and capabilities within partner organizations and with collaborations cobbled together only in response to the grant opportunity. It was apparent that those leaders involved in collaborations had thought deeply about these relationships.

- "They [Our collaborators] didn't seem to have the marketing thing down really strong, and so I'm getting back to it – the administration. I think it's so difficult because as the person administrating these programs, you've got to make sure that you stick with your objectives and that you stick with your logic models and your outcomes. And you have to track and make sure that people are getting done what they said they were, but then my problem was that I didn't have time to nurture them to make sure they got their programs done. . . . I think we had good leadership, but then again it is so limited when you are doing collaboration because you can't really lead other professionals when you all have different agendas."
- "You know, we tried really hard to work with them and they did come and help us with some trainings and stuff, but we focused so hard on collaborating with them in particular . . . . It was kind of like it was all or nothing for them, and we didn't realize that."
- "I think from the get-go we needed more . . . face-to-face. We needed to know each other better, and our relationships needed to be stronger."
- "As far as kind of preparation work, I think really that I would favor a more in-depth partnership development before beginning a program. Because you know, typically the way it goes, you have agencies or organizations who think it is good and they want to help or support, but you know, I think I would really make sure that was well in place and a little broader maybe . . . maybe to be more aware of getting that real solid stable collaborative base first before starting anything."

### ***Program Status after Funding***

In order to ascertain whether or not success or sustainability was related to program existence prior to funding, all program leaders were asked about post-funding program existence.

Three of the programs that leaders rated as a "high" success remained in existence post-Initiative funding. Five who rated their programs' success as high or medium were still functioning in large part, though some portions of the original program had been dropped. The other 7

programs were no longer in existence, although some said their partners' or their own programs had been informed in some way by the healthy lifestyles piece of the Initiative-funded program.

The parts of programs that most leaders reported retaining or incorporating most readily were increased physical activity and nutrition education. Four leaders reported that their community partnerships remained in tact and had helped them extend their reach.

The primary challenge most leaders talked about after the Initiative ended was “funding.” Comments included:

- “Unfortunately once The Trust fund money was finished, my salary was finished as well. And I was pretty much the only one out here.”
- “We’ve got now five different grants that are funding this. Our reporting is five different ways. You know it’s really challenging to do long-term, effective programming when you are pieced out. I didn’t really know we were fully funded until last week. And yet our [program] started last week.”
- “The administration didn’t want to fund it some more.”

Program leaders were asked about changes in their organizations since the Initiative funding ended. These were asked to gauge sustainability of the program pieces and whether or not the organization had been influenced by the grant in a lasting way. The results are displayed in Table 121.

Table 121 Changes in organizations after Initiative funding ended

Potential changes	More	Same	Less
Services provided	8	5	3
Focus on PA	8	5	1
Focus on weight	6	7 (NA or same)	2
Community contact	5	7	3
Focus on FV	5	8	0
Focus on steps	5	8 (NA or same)	0

Program leaders’ responses suggested that most of the programs are providing more services now than they did while the Initiative funded their program and have more of a focus on physical activity. Most organizations’ contact with their target community and focus on fruits and vegetables remained about the same. Focus on weight and steps was irrelevant for many.

### ***Increased Organizational Capacity***

Each program leader was asked about what the organization had learned as a result of the grant. In general, leaders mentioned factors that are likely to improve future programming in their organization in general. They also talked about lessons that may lead to sustainability of Colorado Healthy People 2010 Initiative program elements. Five leaders said that succeeding in doing what they had proposed was simply much harder than they had anticipated.

#### **Program Improvement**

Five leaders mentioned lessons that improved their organization’s program delivery capacity.

- “I guess just learning to empower people. Step back and empower works well.”
- “Then [with] program management, I’ve just learned sometimes it’s the right person, and it’s not always their qualifications.”

- “Some people were motivated by being able to have a group support, and then other people were very independent and able to do it on their own.”

Five leaders commented on increased knowledge of their target communities.

- “I thought, well, gosh, it’s going to be too much for them. . . but I was completely wrong. They care. They want to manage their own food. They want to learn about the nutrition.”
- “We learned a lot about more urban areas and how to work with them, and more about more rural areas and how to work with them through this project.”
- “[It was] more difficult than we thought it would be to make any change.”

### Sustainability

In the literature, one factor that is associated with sustainability is incorporation of new programming into the existing organizational structure.<sup>49, 50</sup> Five leaders said they had learned how to incorporate either Colorado Healthy People 2010 Initiative program practices or philosophies into programming that was intrinsic to their organization.

- “To make sure you get through some of those things so that the programs can work in coordination with existing programs and not be so isolated out there. We’ve been able to pull it back in, and I think it fits better now, but I know that was a little bit of an issue.”
- “The recreational activity - like I said - we’ve been really trying to continue and to incorporate some of the fun aspects into our activities.”
- “And program sustainability – again kind of going back, that systems should be developed that fit into existing program structures, that don’t cost more once they are developed.”

Scholars also discuss the importance of a “champion” for program sustainability.<sup>49</sup> Three leaders mentioned that they had learned what characteristics make a good program manager.

- “[P]rogram management – I’ve just learned sometimes it’s the right person, and it’s not always their qualifications.”
- “In terms of program management, the thing that we learned was to be more cautious about extending ourselves . . . and to either build that in and/or just be really cautious about what you extend yourself to.”

Four leaders commented on the importance of marketing. They did not necessarily say they had learned more about how to market effectively, but rather that they learned how critical marketing is to a program’s success.

- “And then marketing! Boy did I ever learn that if you want to have a successful Initiative, if you get your neighborhood paper and radio and TV behind you, it goes a long way.”
- “It was a great learning grant of what to do differently and how to promote the program.”

Program leaders were also asked about what they wished they knew and still don't know. Almost half said that they did not know how to market to their target community.

- "It's always hard. We have no media. No radio or TV, so we have learned that's a challenge, and that's part of the marketing thing. And how do you get to the low-income SES folks?"
- "I still don't know how to target obese people without hurting their feelings. They don't want to be targeted. The one thing I found at the beginning of our Initiative is that we had a couple people in our group that were obese and they were so uncomfortable talking about obesity that they quit coming."
- "What are the needs of our target community, needs related to health and nutrition? . . . I really don't think that getting to them on a prevention level – from the aspect of it's going to hurt your health or you are going to die young – I don't think that impacts them at all."

Three said they still had evaluation questions. Either they had not figured out what data to gather or lacked the capacity to analyze it in-house.

- "I think we continue to struggle about what to do about the evaluation. What is meaningful? What would we be doing anyway? Being able to assess that in a rapid way so you can develop programs that are appropriate."
- "Data gathering? We could do much better if we could look at that up front before we implement a program and have help and technical assistance. Because again to pay a researcher, we just did a community assessment and paid somebody to analyze it, and it was almost \$4,000. And if I'd have paid for it to include data input, it would have been another \$2,000. . . We only have so much money you know."

Program leaders talked at length in response to the 2 questions specifically asking about program sustainability: "What did your organization learn from this grant about sustainability?" and "What does your organization still need to learn about sustainability?"

Twelve of the program leaders viewed their programs as sustained, on at least one level. One smaller organization reported that other organizations in their community had piggybacked on the Colorado Healthy People 2010 Initiative activities in preceding years, so in a sense, the community health awareness was sustained. Another program leader looked at sustainability of ideas:

- "About program sustainability, that it is possible to take pieces – you know, concepts and pieces – that worked, and we felt good about that."

Several program leaders claimed they still do not know enough about achieving or planning for sustainability. For example, some didn't know how to fund the personnel they felt their program needed. Others didn't know how to forge partnerships with other community organizations in a sustainable manner.

Primarily those programs that were organized by a well-established agency, such as a hospital, a university, or an extension office, were better able to sustain recognizable Colorado Healthy People 2010 Initiative programs than were the smaller community-based organizations. Recognizing their unique advantages, these program representatives made statements such as the following:

- "We just took the [Colorado Healthy People 2010 Initiative program] plan and just pushed it to the next level. And part of it is that we are doing it because we are required to do it, but it's wonderful that we had some of those programs and relationships in

place, so it wasn't as painful for us as maybe for some people who were starting from scratch. And with collaboration, we were very good at that. We became better with the [Colorado Healthy People 2010 Initiative] grant and now even better with the [new] grant. . . . And with marketing, we didn't do as well with the [Colorado Healthy People 2010 Initiative program], but now with the [new] grant, we have a media person who helps us, so we learned that is an important thing to get your message out. From your grant we learned that we could have done more. And sustainability - it looks pretty good. I mean we did sustain it beyond your grant, and it looks good for the future."

- "So what happens is that if you get one of us behind the grant, it can continue forever because we have salaries that give us the money to pay us to continue doing something that works. . . . I think if you do the right activities, people want them to continue. We've found you have to work and tweak things to get it right, and then if it is worth keeping going, you'll know it, and the community will tell you."
- "Our sustainability program was targeted on creating a program that would be so attractive to that organization once we had instituted it, that they would want to continue it."
- "We set the systems up so they were long-term sustainable without added funding. . . . The [Trust] funding was essential to design, to develop, to formalize and, you know, kind of polish up these programs, these educational pieces that fit into our existing programs. But once they are there, it is easy to implement them and, really, there is no added funding needed. . . . Systems should be developed that fit into existing program structures, that don't cost more once they are developed."
- "That's kind of a requirement we have for any external funding that we seek – is that we try to find at least some way we either incorporate it into the regular operations of our program, or we find a way in the community to sustain it, or we look at what are the different ways we can sustain the program. So for us that is a common practice."

## **Conclusions**

Although many organizations ceased their Initiative-funded programs once the grant ended, most had not scaled back on either services or emphasis on healthy lifestyles. Some had secured additional funding to support continued Colorado Healthy People 2010 Initiative programming, while others had simply incorporated healthy lifestyle activities into pre-existent programming. According to the leaders' own reports, increasing program leaders' knowledge and awareness of healthy lifestyles made a positive impact on programming in their communities.

The program leaders all felt that they had learned from their experiences with the Initiative in ways that built their organizational capacity. Some learned to collaborate more effectively with other community organizations, while others learned about program management. Many leaders felt they still did not know enough about sustainable program evaluation and marketing strategies.

## **Appendix IX: Instruments Used in the Evaluation**

The following pages contain copies of the instruments used for the Obesity Prevention Evaluation. These include:

- Adult Participant Survey (combined for program start, end and follow-up)
- Youth Participant Survey (combined for program start, end and follow-up)
- Non-Completer Adult Follow-up Survey
- Non-Completer Youth Follow-up Survey
- Moderator discussion guide for focus groups with successful program completers
- Moderator discussion guide for focus groups with less successful program completers
- Moderator discussion guide for focus groups with program non-completers
- Moderator discussion guide for focus groups with non-completers and less successful program completers
- Moderator discussion guide for 2006 focus groups with adults
- Moderator discussion guide for 2006 focus groups with youth
- Program Leader Initial Interview Script
- Program Leader Follow-up Interview Script
- Community Profile Secondary Data Collection
- Community Profile Yellow Pages/Web search
- Community Profile Local Government Staff Member
- Walkability Form
- Produce Assessment Form