

# Healthy Hearts

## Outcomes Report 2015-2016

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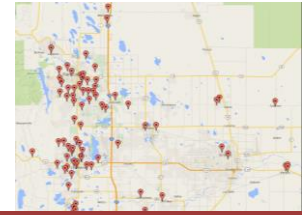
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# Snapshot

## Healthy Hearts 2015-2016 Northern Colorado Reach\*

\*not included on map is Estes Park Elementary



### 2015-16 Education Program Summary:

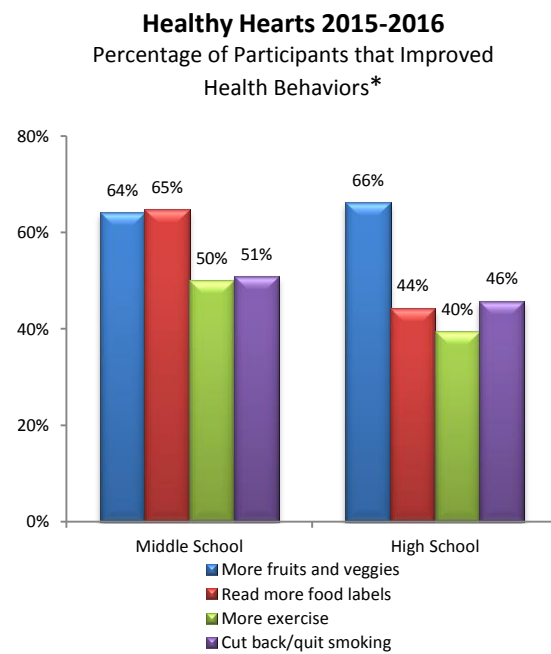
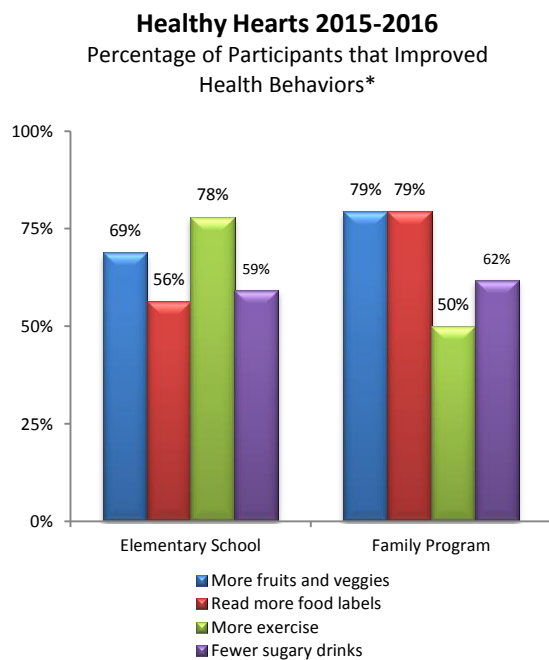
	Elementary	Middle School	High School	Total
# Schools	57	11	11	79
# Educated	3689	1479	2543	7711
# Screened	1985	846	1593	4424
% Screened	55%*	57%	63%	58%*

\*Does not include 92 students from a school that declined the optional cholesterol screening

### 2015-16 Education Program Demographics:

District	# Schools	%HH in	% Free and Reduced
Poudre	52	63%	35%
Thompson	32	91%	36%
Weld RE-2	5	60%	36%
Weld RE-4	9	22%	16%
Weld RE-5J	6	50%	28%
Weld RE-6J	26	8%	66%
Weld RE-7	3	100%	45%
Park	3	33%	36%

### % Improvements Measure after Participation in the Healthy Hearts Programs:



\*For elementary and family program, responses are based on answers to health survey questions

\*For middle school and high school, responses are based on empowerment questions

# Healthy Hearts Program

## Outcomes Report 2015-2016

### Introduction

This Healthy Hearts Program outcomes report reflects comparisons and trend analysis from the program's inception in 1992 through school year 2015-2016. The analysis continues to include elementary and high school screening results, as well as family and individual health behavior data, student's knowledge gained assessments, and a second year middle school program. In 2015-2016, the Healthy Hearts (HH) Program screened 4,424 elementary, middle, and high school students. This report reflects schools from five different school districts in Northern Colorado, representing a wide range of demographics.

### OVERVIEW OF REPORT

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- 7,711 elementary, middle, and high school students received our education program
  - 58%\* (4,424) of those reached participated in the optional cholesterol screening
- \* Does not include 92 students from a school that did not participate in the cholesterol screening*

#### Elementary School

- 23.4% of those screened were overweight (12.5% overweight; 10.9% obese)
- 25.7% of those screened had elevated total cholesterol (20.9% borderline high; 4.8% high)
- 32.4% improved in getting exercise 7 days a week (37% pre, 49% post)
- 10.0% improved in getting 5 servings of fruits and vegetables 7 days a week (30% pre, 33% post)
- 63.6% percent change in those achieving 7 or 8 ideal behaviors (11% pre, 18% post)
- 90.8% showed knowledge gained

#### Middle School

- 30.0% of those screened were overweight (15.9% overweight; 14.1% obese)
- 24.2% of those screened had elevated total cholesterol (19.8% borderline high; 4.4% high)
- 64.8% plan on reading food labels more
- 64.2% plan on increasing fruit and vegetable consumption by at least 1 serving/day
- 50.0% plan on increasing physical activity by at least 10 minutes/day
- 82.1% showed knowledge gained

#### High School

- 26.6% of those screened were overweight (16.0% overweight; 10.6% obese)
- 21.4% of those screened had elevated total cholesterol (16.2% borderline high; 5.2% high)
- 45.8% of those who smoke plan on cutting back or completely stopping smoking
- 44.3% plan on reading food labels more
- 66.2% plan on increasing fruits and vegetable consumption by at least 1 serving/day
- 39.5% plan on increasing physical activity by at least 10 minutes/day
- 87.8% showed knowledge gained

#### Family Program

- 63.9% of participants were overweight (24.8% overweight; 39.1% obese)
- 35.6% of participants had elevated total cholesterol (28.1% borderline high; 7.5% high)
- Participants lost 265 lbs.
- Participants lowered Total Cholesterol by 1000 mgs/dL, an average of 19.6 mgs/dL per person
- Participants lowered Triglycerides by 5015 mgs/dL, an average of 85.0 mgs/dL per person
- 100% of families showed improvement in at least 7 Health Behaviors
- 93% of participants showed knowledge gained

## LIMITATIONS

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Healthy Hearts reached a diverse population among a wide range of communities in Northern Colorado and screened a large size sample group. There are potential limitations to this outcomes analysis. For example, all screenings and surveys are voluntary and reflect only participants who chose to participate.

Secondly, for years 1992-2000, the cholesterol results were from fasting venipuncture tests. The test was thereafter changed to the non-fasting finger-stick method. Although somewhat comparable, the latter testing method may vary as much as 10%. Historically, the Healthy Hearts elementary school-age program was provided to only 5<sup>th</sup> grade students. In 2002-2003 programming was offered to both 4<sup>th</sup> and 5<sup>th</sup> grades. The transition to a 4<sup>th</sup> grade focus was requested by the local school districts in order to support health and science curriculums. Consequently, variances among 5<sup>th</sup> grade populations as well as 4<sup>th</sup> grade populations year to year could also influence outcomes.

Comparative analysis of lifestyle survey data recorded for years prior to 2001 presented a challenge due to differences in data collection and recording. Moreover, documentation describing the methodology of data analysis for years prior to 2001 for lifestyle behaviors was not available. Although not graphically depicted in this report, it should be noted that to-date measurements of blood pressure do not reflect a significant risk to children screened by the Healthy Hearts program.

# Elementary School Program

## SCOPE OF PROGRAM

The standard HH elementary education program consists of three 1-hour presentations followed by a voluntary screening. This year, HH offered a two day presentation covering the same information in a shorter time period to be more convenient for teacher’s schedules. Topics discussed include:

- Basic Cardiac Anatomy, Understanding Cholesterol, Blood Pressure, BMI, and Genetics
- Importance of a Healthy Diet, Reading Labels, Portion Control, MyPlate, and Goal Setting
- Importance of Exercise for the Heart, Brain, and Stress Levels, the Effect of Tobacco on the Heart, how to be a Smoke Free Zone, Saying “No” to Smoking, and Goal Setting
- Optional Cholesterol Screening
  - Body Mass Index (BMI) and BMI Percentile, Blood Pressure, and non-fasting Cholesterol (Total, HDL, and TChol/HDL ratio)

New during the 2015-2016 school year, HH offered heart and lung explorations at different science nights and events. Students were given the chance to get hands-on with real sheep hearts and pig’s lungs and learn basic anatomy and how different choices will affect their health.

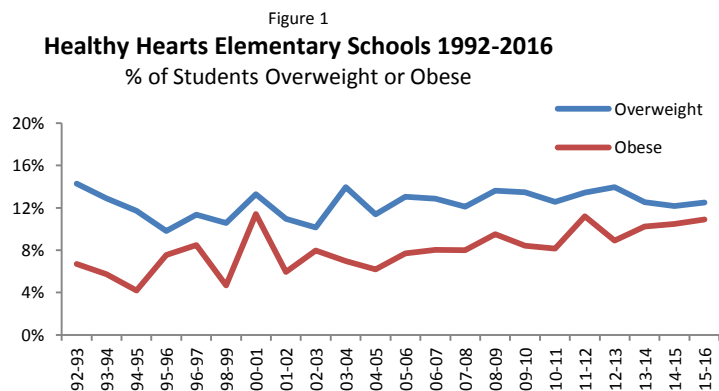
## ELEMENTARY SCHOOL SCREENING DATA

### **Body Mass Index (BMI) Percentile**

Figure 1 reflects elementary school-age screening data for students that had a BMI Percentile value that is considered above normal. BMI is a measure of body weight in relation to height, and is a standardized index based on age and gender. BMI Percentile was determined using gender-specific growth charts that place a child in a percentile relative to weight, height, age, and gender. The CDC categorizes children as “overweight” if they are between the 85<sup>th</sup> and less than 95<sup>th</sup> percentile and are considered “obese” if they measure at the 95<sup>th</sup> percentile or above. According to the 2009-2010 National Health and Nutrition Examination Survey, 16.9% of the nation’s children ages 6-19 were obese.<sup>1</sup> The 2010 Colorado Child Health Survey reported 10% of children ages 2-14 as “overweight” and an additional 12.3% as “obese”.<sup>2</sup>

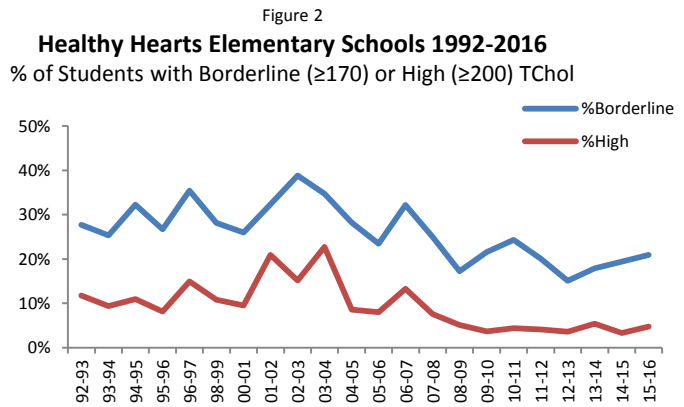
Trend comparisons are shown for academic years 1992-1993 through 2015-2016. There is a gap in the data for the academic years 1997-1998 and 1999-2000 since no funding was available. For the school year of 2015-

2016, the number of students found to be overweight and obese remained relatively unchanged at 12.5% and 11% respectively. 82% of the elementary students that were found to be overweight or obese had at least one additional heart-health risk factor.



### **Abnormal Cholesterol Levels**

The American Academy of Pediatrics recommends universal screening of all 9 to 11-year old children with a non-fasting lipid panel.<sup>3</sup> For 2015-2016, the average total cholesterol for elementary school aged students screened by the Healthy Hearts Program was 155 mg/dl. Figure 2 data shows that 21% of students had “borderline” total cholesterol measures (170-199 mg/dl) while 5% had “high” levels ( $\geq 200$  mg/dl). The decrease in cholesterol reflects trends seen nationally, according to a report released in August of 2012 in the Journal of American Medical Association<sup>4</sup>.



## **FAMILY LIFESTYLE AND HEALTH HISTORY SURVEY**

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The Family Lifestyle and Health History Survey given to the 4<sup>th</sup> grade parents continue to include the components of a healthy diet as recommended by the American Heart Association’s “Life’s Simple 7”, such as servings of fruits and vegetables, the amount of fish eaten, and the number of servings of whole grains<sup>5</sup>. This data is self-reported by the parent or guardian of the 4<sup>th</sup> or 5<sup>th</sup> grader.

## **ELEMENTARY SCHOOL PROGRAM OUTCOMES DATA**

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### **OUTCOME SURVEY MEASUREMENTS**

In the classroom, all 4<sup>th</sup> or 5<sup>th</sup> grade students fill out a knowledge assessment and a health behavior survey to evaluate their cardiovascular and healthy lifestyle knowledge preprogram and one week post program.

- 91% demonstrated knowledge gained

The participating teachers completed program evaluations. Their responses are overwhelmingly positive and 100% stated they would participate in the program again.

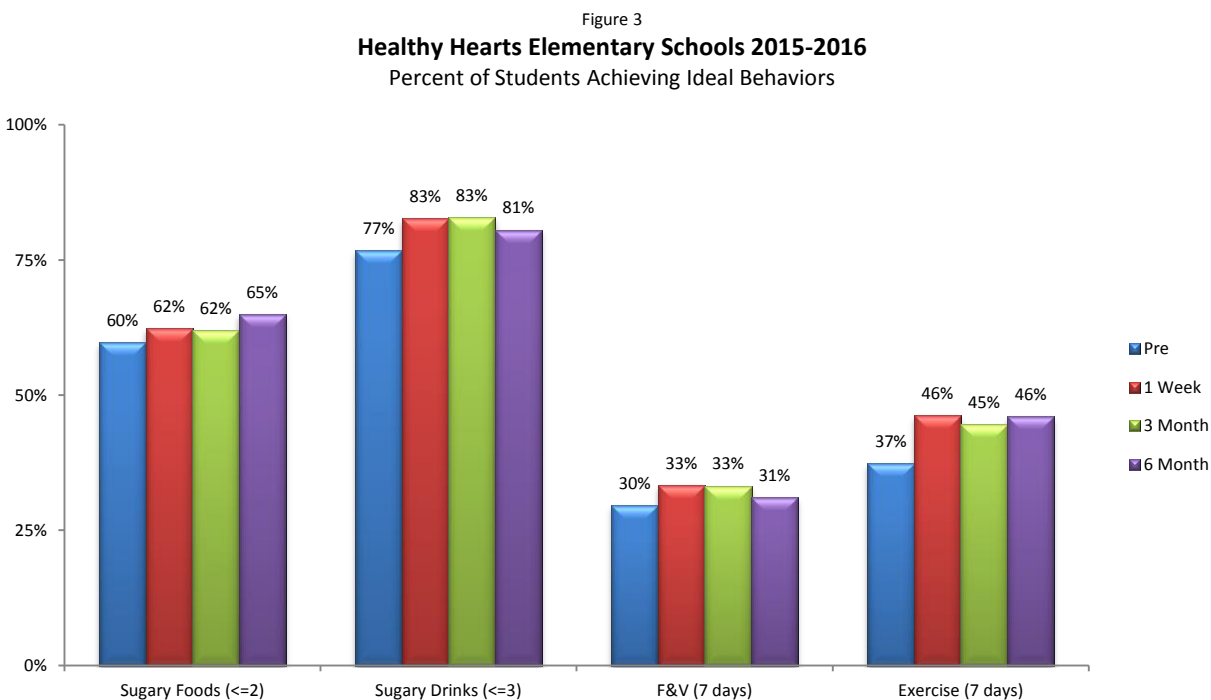
Teacher Responses:

- “The program is almost essential to our curriculum as we have no true health program. Students learn so much from the 3 days of working with the HH leader. It really does make a difference in their eating habits and their awareness of their body’s needs.”
- “Many students (especially our poverty demographic) lack this info because it is not demonstrated at home or parents just do what they can with what they have. It helps our students understand that they have a choice.”
- “Reinforces what we are learning in the classroom and reinforces healthy lifestyle and choices. I know students have made choices as a result of the Healthy Hearts presentation.”

## ELEMENTARY SCHOOL IMPACT DATA

### Impact survey measurements

Schools visited in the fall are followed for 6 months. The students are given the same survey they initially completed to be filled out at the 3-month and 6-month time intervals in order to measure sustained impact and knowledge. The program continues to show an increase in desired behaviors in every category measured as shown in Figure 3.



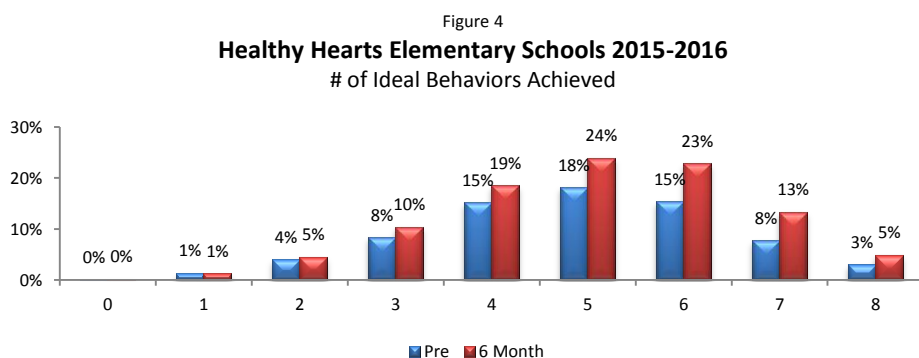
### IDEAL HEALTH BEHAVIORS

The 8 ideal behaviors that 4<sup>th</sup>/5<sup>th</sup> graders are measured on are:

- Exercising 60 minutes daily
- 5 servings of fruits and vegetables daily
- Avoiding 2<sup>nd</sup> hand smoke exposure
- Eating breakfast daily
- 1 serving or more of fish/week
- 3 or fewer sugary beverages/week
- Limiting fast foods to 2 days/week or less
- Limiting high sugar foods to 2 days/week or less

As shown in Figure 4, only 11% of the students surveyed in the fall achieved 7-8 ideal behaviors preprogram. Six months post, there was a 64% increase with 18% reporting 7-8 ideal behaviors achieved. Fruit and vegetable consumption was the most difficult health behavior for an elementary student to achieve with only 31% (six month post) reporting eating 5 servings every day. The next health behavior that was most difficult to accomplish was exercising for 60 minutes daily with 46% reporting achievement (six month post).

As shown in Figure 4, only 11% of the students surveyed in the fall achieved 7-8 ideal behaviors preprogram. Six months post, there was a 64% increase with 18% reporting 7-8 ideal behaviors achieved. Fruit and vegetable consumption was the most difficult health behavior for an elementary student to achieve with only 31% (six month post) reporting eating 5 servings every day. The next health behavior that was most difficult to accomplish was exercising for 60 minutes daily with 46% reporting achievement (six month post).





# Middle School Program

## SCOPE OF PROGRAM

Healthy Hearts developed a pilot middle school program during the 2014-2015 school year. During the 2015-2016 school year, Healthy Hearts received a grant allowing expansion in the middle school program reaching nearly 4.5 times the students more than the pilot year. The HH middle school program consists of a 45-minute presentation covering:

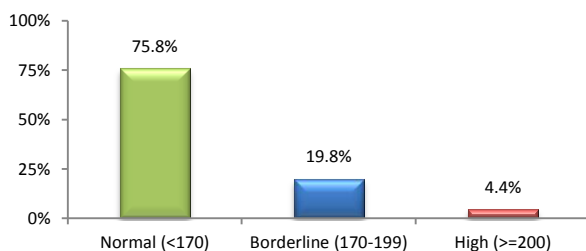
- Cardiovascular Health and Anatomy
- Understanding Cholesterol, BMI, and Blood Pressure
- Signs of Heart Attack and Stroke
- Understanding risk factors (Genetics, Nutrition, Exercise, and Tobacco Usage)

This following day there is an optional cholesterol screening in which students receive their BMI, BMI percentile, blood pressure, and cholesterol numbers. During the screening day, there are also 5 interactive stations each including a different topic relating to a cardiovascular risk factor. The stations include:

- Smoking
- Heart Anatomy and Cholesterol
- Physical Activity
- Stress
- Nutrition

## MIDDLE SCHOOL SCREENING DATA

Figure 5  
**Healthy Hearts Middle Schools 2015-2016**  
Percentage of Students in TChol Ranges



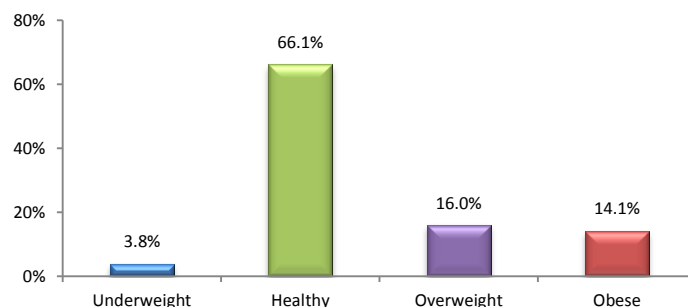
### Abnormal Cholesterol Levels

Healthy Hearts has long screened the cholesterol levels of elementary and high school students but there was a glaring need to reach middle school students as well. The findings are similar to what we've seen in elementary and high school in that roughly 1 in 4 students had elevated total cholesterol levels with 19.8% having borderline (170-199) and 4.4% having high ( $\geq 200$ ) levels.

### Body Mass Index (BMI) Percentile

BMI categorization of middle school age students is done by utilizing the same age and gender specific BMI methodology described previously for elementary students. There was higher prevalence of overweight children in middle school with approximately 1 in 3 (~30%) students falling in the overweight or obese range. Interestingly enough, there was higher number of students in the overweight (16%) and obese (14%) range in middle schools compared to elementary and high schools. This elevated number highlights the necessity of continuation and expansion of the middle school program.

Figure 6  
**Healthy Hearts Middle Schools 2015-2016**  
Percentage of Students in BMI Ranges



## **MIDDLE SCHOOL PROGRAM OUTCOMES DATA**

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### ***Health Behavior Survey Measurements***

The HH program is offered as part of the middle school health curriculum in 11 middle schools in Northern Colorado. The participating teachers continued to give positive feedback during our second year and 100% stated they would participate in the program again.

Teacher Responses:

- “The students were engaged throughout the presentation. The info pertained to the students and they loved the hands on stations. Very powerful! Parents were appreciative for the opportunity to check their cholesterol. “
- “I appreciate how prepared the presenters were and how well they interacted with the students. It felt like we have been working together for years. Thank you for what you provide our students.”

### ***Empowerment and Knowledge Gained***

Students were asked if they were going to increase their exercise, increase their fruit and vegetable consumption, read food labels, and if they smoke would they cut back or completely stop smoking. The students responded positively with 50% planning on increasing exercise by at least 10 minutes per day, 64% planning on increasing fruit and vegetable consumption by at least 1 serving per day, 65% planning on reading food labels, and 89% of students indicated they were able to commit to a tobacco free life. We also saw 82% of students educated showing an increase in cardiovascular knowledge with 95% of students indicating that the presentation was useful to them.

# High School Program

## SCOPE OF PROGRAM

The HH high school program consists of a 90-minute presentation followed by a voluntary cholesterol screening in which the students receive their BMI and BMI percentile, blood pressure, and cholesterol numbers along with the chance to discuss any personal health questions with their screener. Also during screening day, students had a chance to learn hands-only CPR and AED use thanks to a partnership with Poudre Fire Authority. Presentation topics include:

- Cardiovascular Health and Anatomy
- Understanding Cholesterol, Blood Pressure, and BMI
- Understanding Risk Factors (Genetics, Diet, Exercise and Tobacco usage)
- How to Stay Tobacco Free or Quit Smoking
- Goal Setting to Decrease Personal Risk Factors

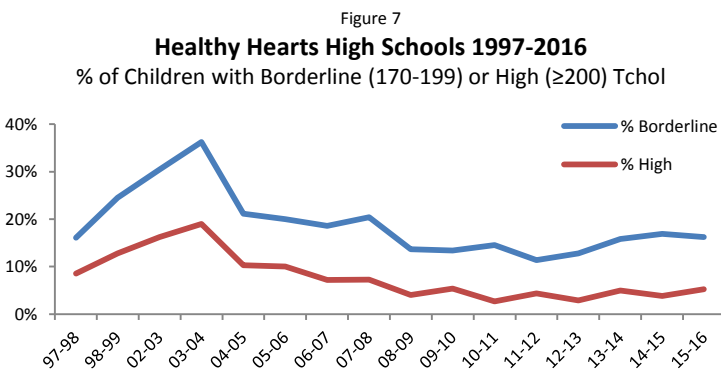
## HIGH SCHOOL SCREENING DATA

Figures 7 and 8 reflect data obtained for high school students screened from 1997-2016. Data from years 1999-2000, 2000-2001, and 2001-2002 was not collected.

### Abnormal Cholesterol Levels

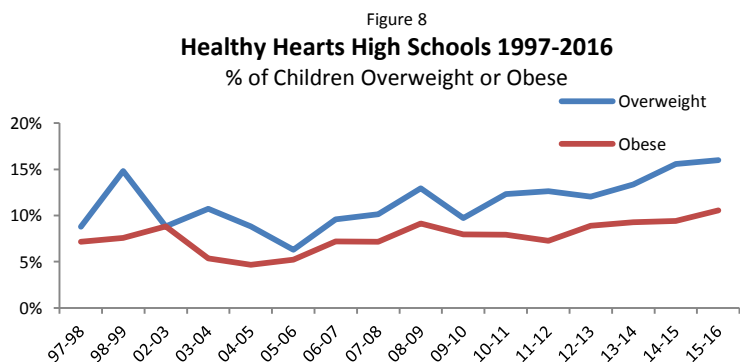
Figure 7 shows a slight decrease in those students found to have borderline total cholesterol ( $\geq 170$  mg/dl) at 16.2% while those that had high total cholesterol ( $\geq 200$  mg/dl) increased slightly at 5.2%. The

average total cholesterol level for high school students screened was 151 mg/dl. National data collected on adolescents aged 12-19 report 20.3% have abnormal lipid levels (NHANES 2005-08) while our participants had 21.4%.<sup>1</sup>



### Body Mass Index (BMI) Percentile

Figure 8 reports the BMI categorization of high school age students utilizing the same age and gender specific BMI methodology described previously for elementary students. Data from the 2015-2016 school year showed a slight increase of students found to be “overweight” at 16.0% and a leveling off of those found to be “obese” at 10.6%. In comparison, the 2009 National Children’s Health Survey found 11.1% of high school students in Colorado were reported as “overweight” and 7.1% were “obese”.<sup>2</sup>



Seventy-one percent of those students that were identified as either “overweight” or “obese” also reported having at least one family risk factor including diabetes, high blood pressure, high cholesterol, having a family member who is also overweight, and history of mental illness, depression, or anxiety. For all of the high school students screened, 38% of them reported having 2 or more family risk factors.

## HIGH SCHOOL PROGRAM OUTCOMES DATA

### Health Behavior Survey Measurements

The HH program is offered as part of the high school health curriculum in 10 high schools in Northern Colorado. The participating teachers continue to give positive feedback and 100% stated they would participate in the program again.

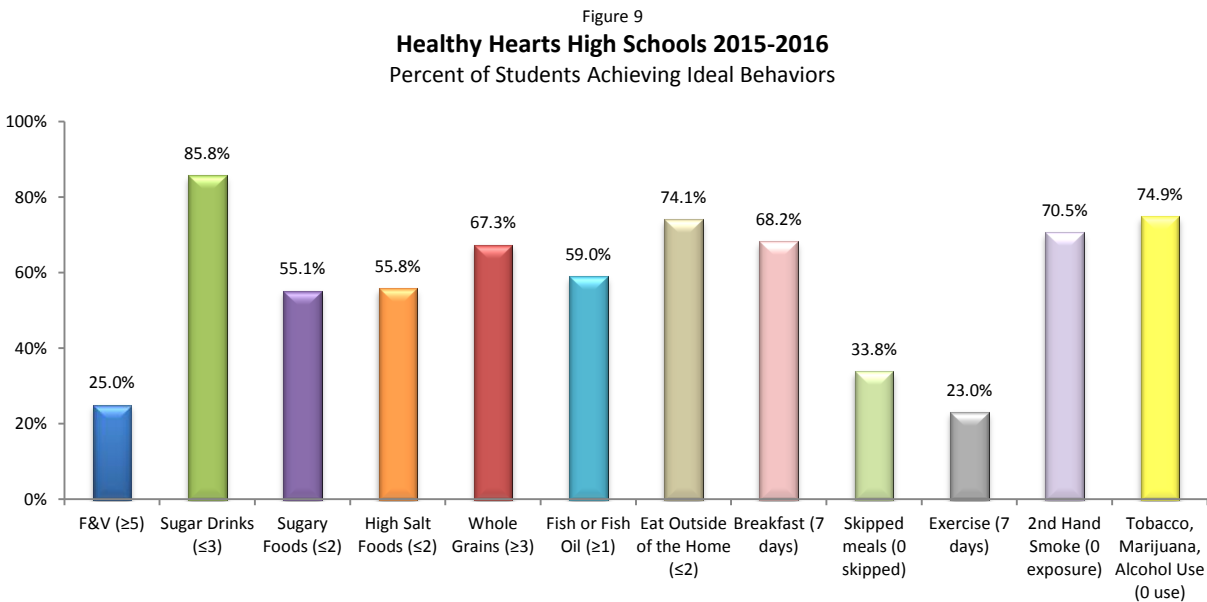
Teacher Responses:

- “The material is presented in a way that students have the opportunity to see how their choices are already effecting their health. Plus I like the screening and CPR portion and always want to be able to use that resource.”
- “The presentation was very clear and informative, and it covered many concepts that I traditionally cover in my Health classes. The opportunity for a free cholesterol screening and a 1 on 1 consultation with an educator was amazing and desperately needed! Thank you so much!”

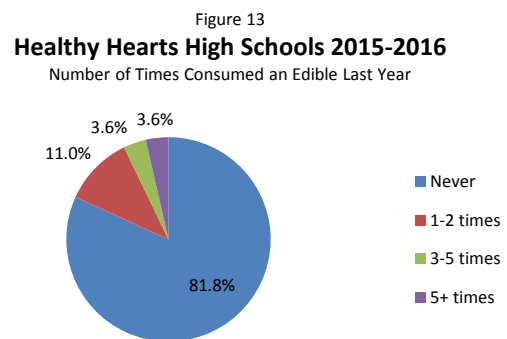
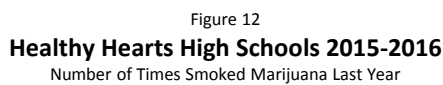
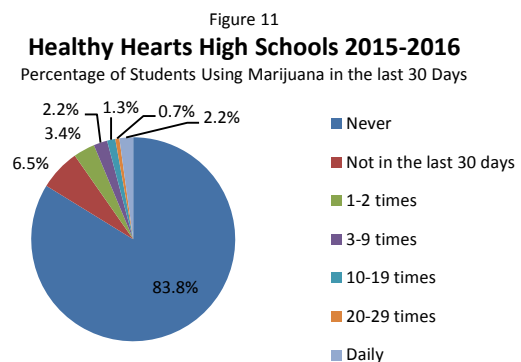
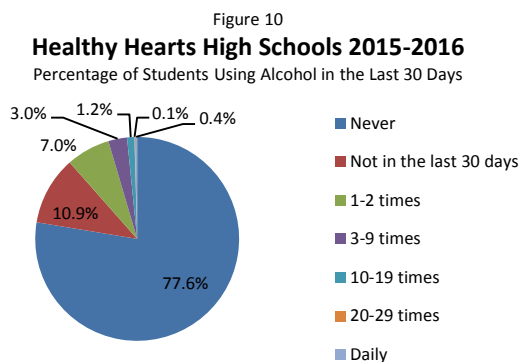
A pre and post program test is given to the high school students to gauge knowledge gained and level of empowerment.

- 88% increased their cardiovascular health knowledge
- 92% felt the program was useful

Figure 9 provides a snapshot of the self-reported health behaviors for a high school student in Northern Colorado. Each health behavior had its own criteria in order to be counted as ‘achieved’. The health habits’ criteria are enclosed in parenthesis after its name.

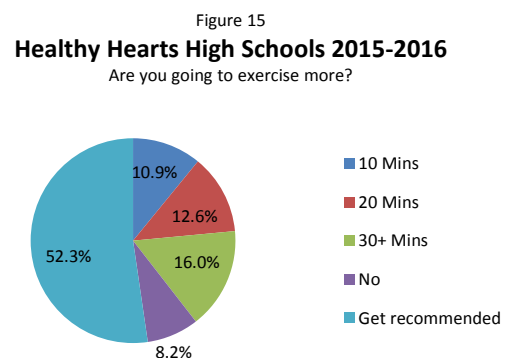
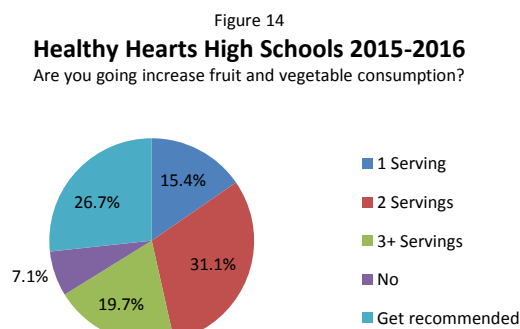


In addition to the health behavior habits, the students were also surveyed on their tobacco use, marijuana use, and alcohol use. HH has shared this information with Team Fort Collins, a group dedicated to prevent drug and alcohol abuse in adolescents. Figures 10, 11, 12 and 13 highlight some of the questions asked to students.



**Empowerment: exercise and fruits and vegetables consumption**

Students were asked if they were going to make a change in their current fruit and vegetable consumption or amount of physical activity after the presentation. Figure 14 shows 66% are planning on increasing their fruits and vegetables by 1 or more servings per day and Figure 15 shows 40% plan to increase their level of physical activity by at least 10 minutes per day.



### **Empowerment: tobacco usage**

Students self-report their tobacco usage. 9.7% surveyed report that they smoke at least once a week and 29.5% are around 2<sup>nd</sup> hand smoke at least one day a week. Of those students who currently smoke, 46% plan on decreasing or stopping completely. The high school students also state the sources for their 2<sup>nd</sup> hand smoke exposure. Smoke exposure from their parents and other family members accounted for 61% of all encounters. Common 2<sup>nd</sup> hand smoke exposure:

- 40.8% parents
- 22.3% friends
- 17.5% relatives
- 19.5% other

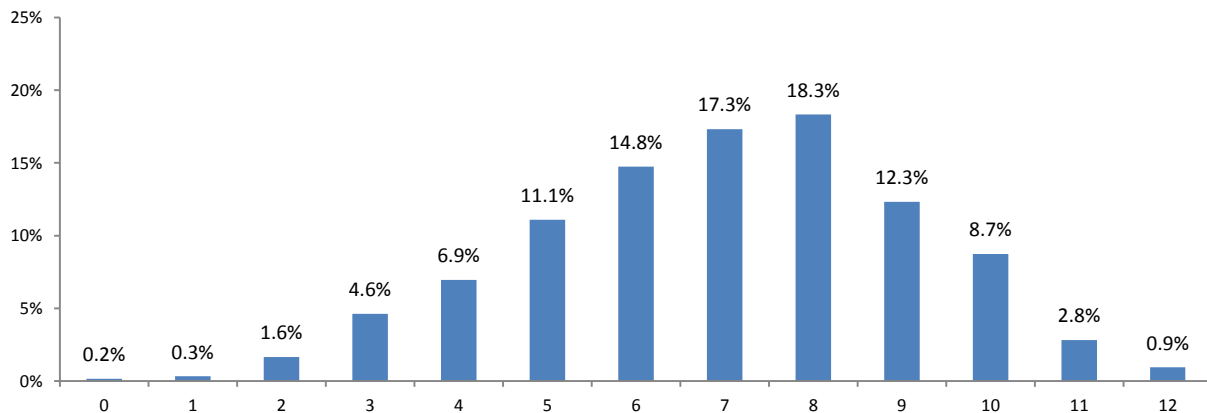
### **Ideal Health Behaviors for High School**

The 12 ideal health behaviors that the high school program evaluates are:

- 5 servings of fruits and vegetables daily
- 3 or fewer sugary drinks per week
- 2 or fewer sugary foods per week
- 2 or fewer high salt foods per week
- At least 3 servings of whole grains per day
- Not using tobacco/alcohol/marijuana
- At least 1 serving of fish/fish oil per week
- 2 times of fewer eating fast food per week
- Eating breakfast daily
- Skipping 0 meals per week
- Exercising daily
- Avoiding 2<sup>nd</sup> hand smoke

Figure 16

### **Healthy Hearts High Schools 2015-2016** Number of Ideal Behaviors Achieved



Very few students achieved either 0 Ideal Behaviors or 12 Ideal Behaviors. The toughest Ideal Behavior for students to achieve was exercising 7 days a week (23% achieved), followed by eating 5 servings of fruits and vegetables daily (25% achieved). The easiest Ideal Behavior for students to achieve was limiting sugary drinks to 3 servings per week (86% achieved) followed second by not using tobacco products, alcohol, or marijuana (75% achieved). Our findings are consistent with and validate what the AHA published in the Status of Cardiovascular Health in US Adolescents<sup>5</sup>.

# Healthy Hearts for Healthy Families

## SCOPE OF PROGRAM

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The prevalence of cardiovascular risk factors is meaningfully associated with being overweight or obese both within the child as well as the family. This data suggests risk factor reduction and prevention must focus on overweight and obesity and not be done in isolation of the family. HH has long identified children with risk factors for cardiovascular disease (CVD) but has not offered an intervention to these students and their families. Thanks to a generous donation by the AstraZeneca HealthCare Foundation's *Connections for Cardiovascular Health<sup>SM</sup>*, HH was able to create Healthy Hearts for Healthy Families for families across Northern Colorado in 2014. During the 2015-2016 school year, the class was offered at three separate time points including one session being offered in a community clubhouse. The 6-week class focuses on reducing a family's risk factors for CVD by learning about:

- Basic Cardiovascular Health and Anatomy
- Nutrition
- Physical Activity
- Reading Food Labels and Buying Nutritious Food on a Budget (via Grocery Store Tour)
- Stress Reduction and Tobacco Avoidance

Participants received a baseline cholesterol, BMI, blood pressure screening, and filled out a health survey. They received the same health survey at the 6-week, 3-month, and 6-month check-ins. At the 3 month check-in they also were measured for height, weight, and blood pressure and at the 6-month check-in participants received the full cholesterol, BMI, and blood pressure screening again.

## FAMILY PROGRAM OUTCOMES DATA

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Using data collected via the elementary school program, HH identified children at risk for developing cardiovascular disease and invited them and their families to attend the program. During the course of the school HH served 51 new families with a total of 163 individual participants. Free childcare was provided for families with children younger than 4<sup>th</sup> grade.

### Participant Demographics:

- 64.0% of participants were either overweight or obese (39% in children, 85% in adults)
- 34.7% of participants had borderline or high total cholesterol levels ( $\geq 170$  in kids,  $\geq 200$  in adults)
- 100% of families had at least one risk factor for CVD with the average family having 6 risk factors\*
- 48% of families participated in free and reduced lunch

\*Risk factors include elevated cholesterol, blood pressure, triglycerides, or glucose, current smoker, sedentary lifestyle, kidney disease, stroke or transient ischemic attack, diabetes, carotid artery disease, abdominal aortic aneurysm, peripheral artery disease, heart attack or heart surgery, heart disease, and family history of high blood pressure, high cholesterol, diabetes, stroke, or heart disease

Participant and family success was based upon the improvement of 19 different health behaviors/biometric results. Nine of these behaviors were based on biometric values while the other ten were based on self-reported health behaviors. The biometric/health behaviors are:

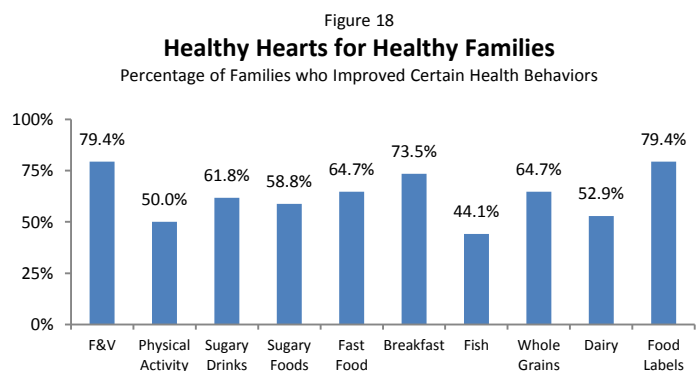
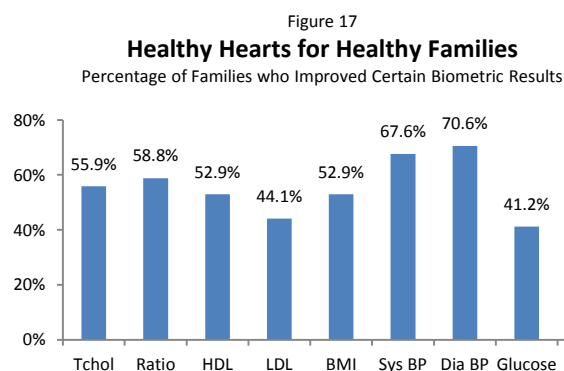
- Lowering Total Cholesterol
- Raising HDL
- Improving Total Cholesterol/HDL ratio
- Lowering LDL
- Improving BMI
- Lowering Systolic Blood Pressure
- Lowering Diastolic Blood Pressure
- Lowering Glucose
- Lowering Triglycerides
- Increasing Fruit and Vegetable Consumption
- Increasing Physical Activity
- Reducing Sugary Drink Consumption

- Reducing Sugary Food Consumption
- Reducing Fast Food Consumption
- Eating Breakfast Daily
- Increasing Fish Consumption
- Increasing Whole Grain Consumption
- Increasing Dairy Consumption
- Reading Food Labels More

Of the 51 families participating in Healthy Hearts for Healthy Families, 34 completed the course and followed up during the 6-week, 3-month, and 6-month check-ins. Of these 34 families:

- 100% of families improved in at least 7 different health behaviors with the average family improving 11 behaviors
- 79% of families improved in reading food labels
- 79% of families improved their fruit and vegetable consumption
- 59% of families lowered their TChol/HDL ratio
- 93% of participants showed an increase in knowledge gained
- 97% of participants agreed that they benefitted from the program and 98.5% of participants agreed their family benefitted from the program
- 265 lbs were lost
- Triglycerides were lowered by 5015 mgs/dL
- HDL was increased by 415 mgs/dL

Figure 17 shows the improvement families showed in biometric measures while Figure 18 shows the improvement in self-reported health behaviors. This data illustrates the importance of educating the family together as a unit rather than educating the child and hoping they will be an ‘agent of change’ for their family.



#### Family Comments:

- “Thank you to all the sponsors, volunteers, staff, doctors, and Medical Center of the Rockies for allowing all the families to participate in such an educational yet fun class that will develop healthy habits for life. We met so many amazing families and that staff have become our friends, as well as our motivators. My family has benefitted so much from the information, the tools (Fitbit and toolbox), and the support from other families and staff. We are making healthier choices in our diets, exercise, and just our lifestyle in general. We enjoyed this class and looked forward to it every Monday.”
- “This was an amazing learning experience. The education, the Fitbit, and the gift cards were so helpful to start a new path and make positive changes for my health. I lost 10 pounds in four weeks and completely changed my way of life for the better. Thank you so much to all. I will continue being a healthier person because of this program.”



In addition to the three sessions of the family program, HH also invited back the original 75 families for a one year check in. Of those 75, 55 families returned for the check in. Of those 55 families:

- 94% retained knowledge gained
- 85% lowered their total cholesterol or stayed in an optimal range
- The average family improved in 11 ideal health areas
- 78% improved in reading food labels
- 71% improved in fast food consumption

## Adult Biometric Screenings

Healthy Hearts screened 560 adults during the 2015-2016 school year including offering biometric screenings to four businesses for profit. These screenings meet wellness standards and incentives for businesses and can be tailored to meet any of the client's needs. In the first year of these screenings, HH served four businesses and screened 382 individuals. HH's competitive advantage is offering these screenings at a lower cost than competitors, having biometric values calculated and on the spot and explained thoroughly by a health care professional, providing local resources for individuals needing assistance with their health, the ability to enter patient results into our medical records system making results viewable by the patient's primary care provider, and custom report generation. On top of all that, any and all income received goes directly into funding the expansion of our school based programs and our family program, keeping resources in the community making our children and families healthier.

## Recapture Data

With the addition of the middle school program, HH hopes to reach students in Northern Colorado at three different time points before they complete school and move into adulthood. Our mission at HH is to interrupt patterns of cardiovascular disease by educating and empowering youths to take charge of their health and to know their personal health numbers. Thanks to improved data collection and recording techniques, we were able to identify children HH has screened in both elementary school and high school. Additionally, this year we were able to identify children seen in elementary and middle school. In approximately two years we will have our first students who will have had HH education at three separate time points during their K-12 careers.

### DATA HISTORY AND RECAPTURE PROCESS

When data started being collected in 1992, students were only recorded with the first initial of their first name and their last name. Data was recorded this way from 1992 to 1998. High school data, which was first recorded in 1997, was recorded by using the full first name and the full last name. This made it a challenge because there often were multiple returns. For example, HH screened two J Smiths in elementary school and in high school HH screened a John Smith. The challenge here is accurately identifying the correct student in order to accurately compare results from elementary school to high school.

All students screened in high school were searched for two separate ways. First they all had a full name search, looking back across all previous elementary data. Second, they all had a search just including the first initial of their first name and their last name. Student searches that didn't return any results were excluded and the remaining results had to pass a series of four tests in order to be considered a

rescreen. First, there was test run to see if the database returned multiple results (see J Smith). Second, the elementary screen date was subtracted from the high school screen date to see time between screens. Assuming an elementary school student is 9-11 years old and a high school student is 14-15 years old, the screen date difference had to be within a 3 to 6 year range. Third, we compared the two gender returns to ensure they matched. And finally, the student's date of birth was checked to see if it was the same at the two time points. If a student passed all of these tests, they were considered a rescreen. If they did not pass one of these tests, the student was flagged and required closer inspection.

## **RECAPTURE OUTCOMES DATA**

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Throughout HH's history, we have screened over 14,500 elementary school students and over 8,200 high school students. Using the process described above, we feel confident that we have rescreened 1,316 students in either middle or high school. Of those students, 1,228 had comparable cholesterol results and 1,288 had comparable BMI results. Of the students screened in elementary and high school:

- 67.4% lowered their total cholesterol (TChol)
- 86.7% either lowered their TChol or stayed in the optimal range (<170)
- 79.8% of students with borderline ( $\geq 170$ ) or high TChol ( $\geq 200$ ) lowered their TChol
- Of those with borderline or high TChol, 58.4% moved to the optimal range
- 62.6% of students overweight/obese lowered their BMI percentile
- 31.6% of students overweight/obese lowered their BMI percentile into the healthy range
- The average TChol of those who moved from overweight/obese to the healthy range dropped from 169.4 to 150.3 mg/dL

The high school rescreen data shows the benefit of reaching a student multiple times and the need for continued expansion. Elementary expansion is needed in order to identify students with higher risk for cardiovascular disease so they can begin to make lifestyle changes early. Continued middle school expansion is needed to recapture more of these elementary school students and to reinforce ideas taught in elementary school and expand on them. High school expansion is needed in order to recapture elementary school students and middle school students and reinforce and expand on ideas taught in earlier grade levels. Starting during the 2017-2018 school year we should see our first students rescreened at three time points (elementary, middle, and high school).

## Future Direction

Healthy Hearts continued expansion in 2015-2016. We increased our reach by serving 79 schools compared to 65 schools in 2014-15, increased the number of children educated (~5200 to ~7700), and increased the number of students screened (~3200 to ~4400). During the 2016-2017 school year we want to do even more. Our main goal is to be in 100% of Thompson and Poudre School District schools and to expand our reach in Weld County schools.

The Healthy Hearts program is constantly looking for ways to improve receptiveness and engagement to the students we serve. Our goal is to make our education sessions as interactive and meaningful as possible. To accomplish this, we would like to create age-appropriate workbooks and materials for a student to keep and refer to during and after the education sessions. We also hope teachers will integrate these resources into their curriculum and be used year-round.

The Healthy Hearts High School program is working with Team Fort Collins to assess the effects, use, and attitudes of smoking and marijuana use among teenagers as it relates to cardiovascular health. In addition, Healthy Hearts is working with Poudre Fire Authority to bring hands-only CPR instruction and AED use to the high schools.

The Healthy Hearts program saw tremendous success during the second year of Healthy Hearts for Healthy Families. We would like to consistently offer the class year round and in multiple languages (English and Spanish). We would also like to work closer with physicians and clinics in order for them to refer patients directly to use and increase collaboration across the system.

With the expansion of the education program in 2014-15, came an expansion of staff and equipment. With these additional resources Healthy Hearts is looking to expand adult biometric screenings and offer them teachers, school districts, and businesses. Healthy Hearts is working with UCHHealth, EPIC (medical records system), and reaching out to local businesses to offer these screenings to more organizations and raise funding to support our program.

Being housed in Northern Colorado Research at Medical Center of the Rockies we are constantly looking for new and innovative research studies. Currently, we are working with Colorado State University to expand our Bean and Rice Intervention program.

## Conclusion

Healthy Hearts built on previous expansion during the 2015-2016 school year. We increased our reach in the community and the staff. While there were a lot of successes, there were many processes we identified that could be modified and optimized. We are constantly looking for innovative ways to teach all different age groups appropriate and interactive cardiovascular knowledge that can improve one's health and improve one's life.

The Healthy Hearts data for 2015-2016 showed a slight increase in the percentage of elementary students (23%), middle school students (30%), and high school students (26%), who are overweight or obese. The percentage of students found to have borderline or high total cholesterol levels was 26% for elementary, 24% for middle school, and 21% for high schools.

The Healthy Hearts program continues to have a high participation rate in the optional for the elementary, middle, and high school age screening program with our goal being to screen at least 60% of students educated. During the 2015-16 school year, we screened 58% of the students educated. We were close to attaining our goal and we attribute this to going to new schools and having new educators. We are putting processes in place to hopefully increase participation next school year.

We continued to receive positive feedback and evaluations from the teachers. In fact, 100% of the teachers this year found value in the program and stated that they would participate in the program again.

The Healthy Hearts Program strives to educate and empower young people to make healthy choices by providing the knowledge, skills and opportunities needed to make good health decisions. We visited 65 elementary schools and saw around 3,700 students. 96% of these students showed an increase in knowledge gained and positive health behavior changes were also sustained six months after the program. The students reported increased consumption of fruits and vegetables, increased daily exercise, drinking fewer sugary drinks, and eating fewer sugary foods.

The Healthy Hearts Program expanded its reach in middle school classrooms and over to educate around 1,500 students in 11 different schools. 92% of students found the presentation useful and 82% showed an increase in knowledge gained. After participating in the Healthy Hearts Program, 62% of students planned on reading food labels, 64% planned on increasing fruit and vegetable consumption, and 42% planned on increasing physical activity.

The Healthy Hearts Program saw nearly 2,550 high school students and screened 63% of them. 96% of students found the presentation useful and 87% showed an increase in knowledge gained. After participating in the Healthy Hearts Program, 62% of students planned on reading food labels, 76% planned on increased fruit and vegetable consumption, 44% planned on increasing exercise, and of those who smoked, 51% plan on cutting back or completely stopping.

Healthy Hearts for Healthy Families was in its second year and served 51 families and 163 participants from Northern Colorado. These families were invited based on risk factors identified during the Healthy Hearts elementary school screenings. All families had at least one risk factor with the average family having four. Upon completion, participants lost 265 pounds and 100% of families showed improvement in at least seven different health areas (biometric value or health behavior).

The Healthy Hearts Program is in line with the number one focus of The National Prevention Strategy: America's Plan for Better Health and Wellness to prevent cardiovascular disease for both children and adults. Healthy Hearts continues to utilize the American Heart Association's concept of "Life's Simple 7" to educate students and their families.

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