

**Results from Year One of the:**

**Seacoast Physical Best Project**

**Report & Data Analysis by:**

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**Funded by the Foundation for Seacoast Health**

## **Executive Summary**

In the Spring of 2005 the Seacoast Physical Best program was launched to address the childhood obesity levels of elementary school students in six seacoast NH schools. The childhood obesity levels for school children in NH at that time were reported by The NH Healthy Schools Coalition as 18% of all school aged girls and 22% of school aged boys were in the overweight or obese category as defined by the Centers for Disease Control and another 20% of both girls and boys were in the at-risk for overweight or obese category. Funding for this project came from the race proceeds of the *New Hampshire Seacoast Run, Pedal, Paddle* with matching funds from the *Foundation for Seacoast Health*. Each participating school implemented programming based on approved Action Plans, which were built on evidence based intervention strategies. Each school participated in an evaluation process to measure the effectiveness of their individual interventions to improve the health status of their school children.

The results show that the fitness abilities of students at funded schools in post testing;

- are significantly better than those at unfunded control schools,
- are significantly better in schools implementing multivariate action plans,
- are significantly better than the baseline measures taken in their individual schools.

## **Seacoast Physical Best Program and Evaluation Process**

In October 2005 the third annual “Seacoast Run, Pedal, Paddle” was held at the Newcastle Commons to raise funds for a project to address the childhood obesity rates of students in six elementary schools in the seacoast NH area. The Foundation for Seacoast Health provided matching funds for the race proceeds. Over \$24K dollars were distributed to the participating schools. Each of the schools agreed to participate in the Physical Best Program that allows students to create individualized fitness plans and incorporates the Fitnessgram assessments to measure individual changes in children’s health status, which is represented as Body Mass Indices (BMI) and the ability of children to achieve the healthy fitness zone for a small number of fitness tests. Fitnessgram testing for children in kindergarten through second grade includes the pushup test, trunklift test, curlup test, sit and reach left test and sit and reach right test. For BMI information, children had their height and weight taken and these data were converted to BMI using the standard formula  $BMI = (\text{weight} / (\text{height} * \text{height})) * 703$  with weight in pounds and height in inches. Tamara Martin, the chairperson of the NH Healthy Schools Coalition collaborated with the *Foundation for Seacoast Health* to complete the evaluation of this funding initiative.

Schools were asked to record “baseline” data on their students before starting their interventions. A physical education professional from each school completed training to create an Action Plan to address health status of the children in their schools. These Action Plans were designed to improve physical activity, nutrition education or the food environment. Some schools implemented multiple intervention programs. Once the

Action Plans were approved, the schools were to implement their Action Plans with funds received. After this implementation, schools were asked to record “post” data to be compared with the “baseline” data to test the effectiveness of the changes. Additionally, schools were asked to identify students with consistent numerical identifier labels so that individual student performance could be tracked.

Five schools out of six submitted some version of data (83%) for evaluation. Five schools out of six submitted baseline data that could be analyzed properly (83%). Four schools out of six submitted post data that could be analyzed properly (66%). Three schools out of six submitted baseline and post data with consistent identification numbers so that individual student performance could be tracked (50%). In total data on 1249 students were analyzed for children in the funded group.

Additionally, six (6) elementary schools not receiving funding were identified based on demographic indicators and used as controls. There were complete data for 977 children in the control group. For this analysis, post data of the intervention sites was compared to post data of the control groups as a measure of the effectiveness of these types of interventions.

Once the data were submitted, the BMI results were analyzed for all children. Each was placed in one of four categories: underweight, normal, at risk for overweight or overweight. The standards were created determined with information from the CDC that is based on age and gender:

- “Underweight” is defined as an individual with a BMI less than five percent (5%),
- “Normal” is defined as an individual with a BMI between five percent (5%) and eight-four percent (84%),
- “At risk” is defined as an individual with a BMI between eighty-five percent (85%) and ninety-four percent (94%),
- “Overweight” is defined as an individual with a BMI greater than ninety-five percent (95%).

Additionally, fitness data were analyzed using Fitnessgram minimum standards established by age and gender by the Cooper Institute and endorsed by the American Alliance for Health, Physical Education, recreation and Dance (AAHPERD). If students met the minimum fitness standard, they were indicated as “passing” the test. The four fitness tests that were completed were the curlup, pushup, trunklift, and the sit and reach on both the left and right sides.

- The curlup test measures abdominal strength and endurance.
- The pushup test measures upper body strength and endurance.
- The trunklift test measures trunk extensor strength and flexibility.
- The sit and reach test measures adequate joint flexibility that is important to functional health.

## Evaluation Results

The following tables and graphs and their descriptions show post data of Seacoast NH funded schools compared to the control schools.

The results show that the fitness abilities of students at funded schools in post testing are significantly better than those at unfunded control schools. Fitness testing is usually considered a measure that can be changed by implementation of improved physical activity, nutrition and improved food environment programs, which seems to be the case here. The children at funded schools were much more likely to pass all Fitnessgram tests than their counterparts at unfunded control schools. For children age five, the percent passing all tests was forty-four percentage points higher at funded schools than for children at unfunded control schools. For children age ten, the percent passing all tests was fifty-three percentage points higher at funded schools than for children at unfunded control schools, due to the introduction of the pacer test at age ten. The pacer test measures cardiovascular performance and recovery. The students at the funded schools performed significantly better on this test. In the state of New Hampshire as a whole the pacer test is the test students are least likely to pass.

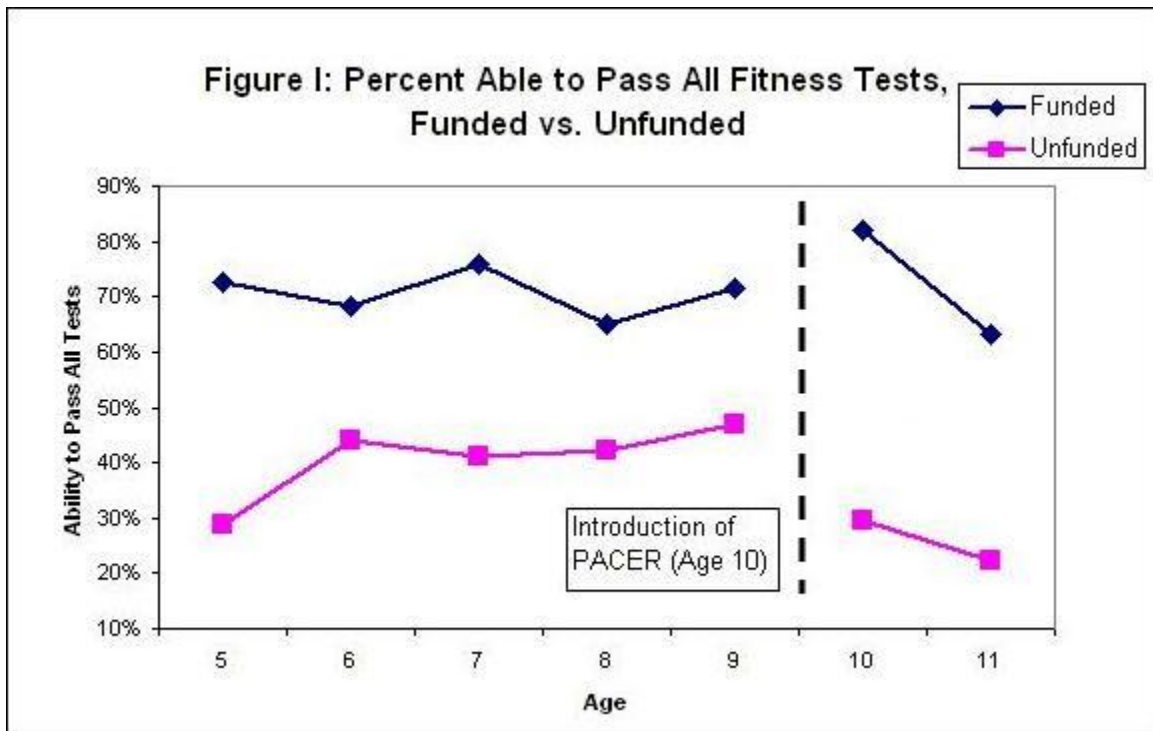


Figure I indicates the ability for children to pass all required tests. The data collected in schools that were funded by the Seacoast Physical Best Program in 2005 are in dark blue, the data for the control group from 2005 are in magenta. The data show that the control group has a significantly lower rate of passing all required tests than the funded schools at all age levels. It is also clear that students at the earliest age levels did significantly better than children at the earliest age levels at the unfunded or control schools.

The results show that the fitness abilities of students at funded schools in post testing are significantly better in schools implementing multivariate action plans. The following strategies were tested; physical activity only (PA), physical activity with nutrition education (PAN), and physical activity with food environment and nutrition education (PAEN). Figures IIA and IIB demonstrate the greater effectiveness of multivariate approaches to improving the health status of elementary school aged children at all age levels

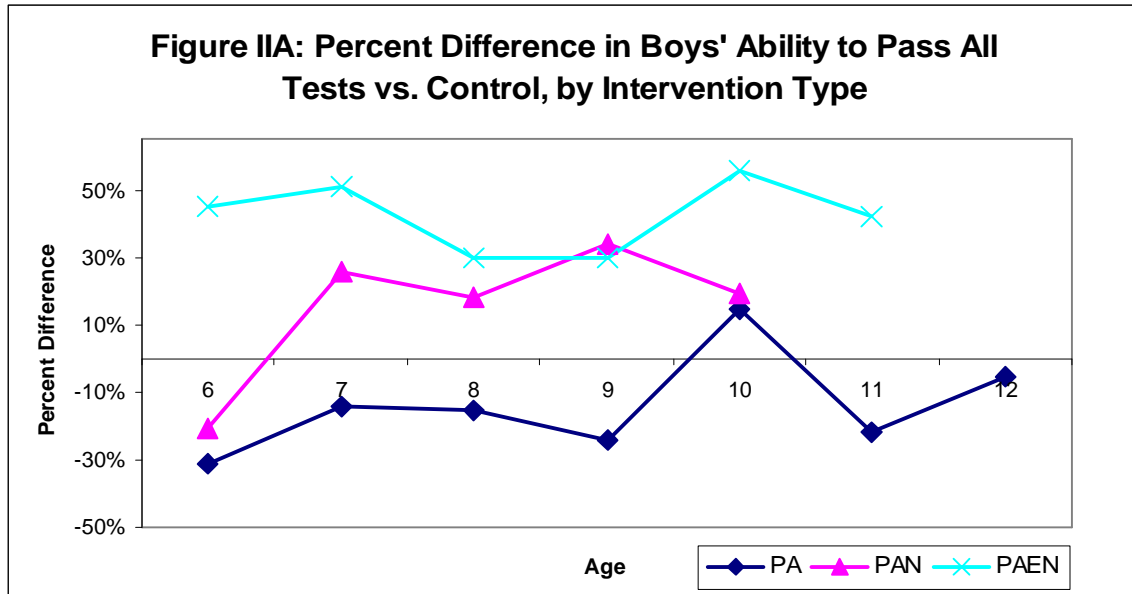


Figure IIA shows that boys receiving physical activity programming only (PA) improved their ability to pass all the fitness tests at age ten. At all other ages they were less likely to pass the same tests they had completed at the start of the same school year. Boys receiving physical activity and nutrition education programs (PAN) were more likely to improve their fitness tests scores at all ages except the earliest, with parity at the other ages. Boys receiving physical activity, nutrition education and changes in the school food environment to increase the nutritional content of foods served (PAEN) were significantly able to pass all fitness tests at all ages, and this was the only intervention that was successful at the youngest age group.

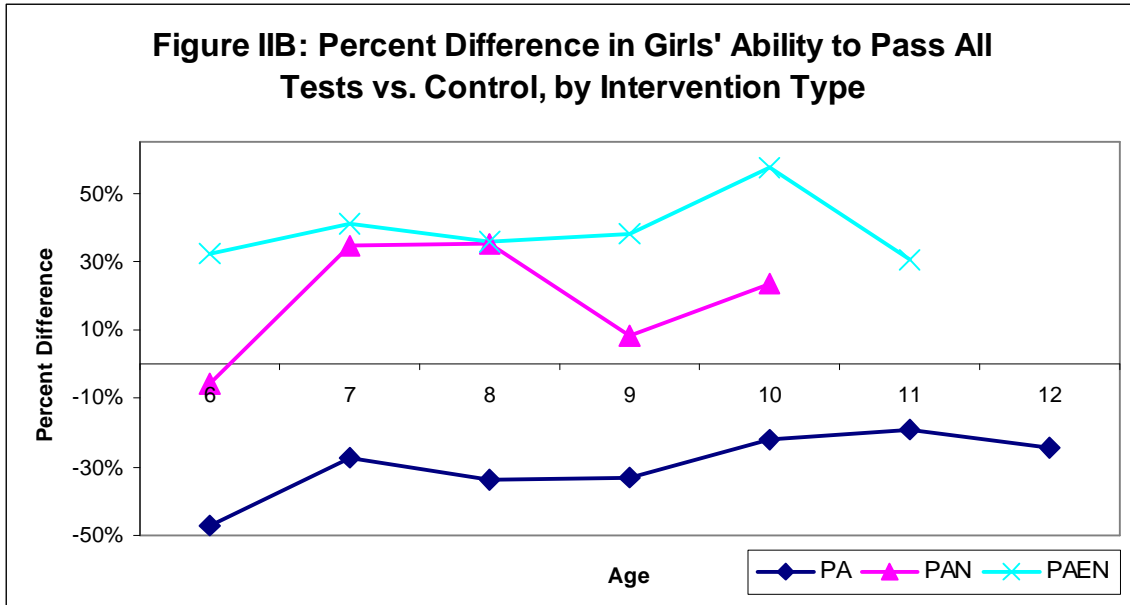


Figure IIB shows that girls receiving physical activity programming only (PA) did not improve their ability to pass all the fitness tests at any age. At all ages they were less likely to pass the same tests they had completed at the start of the same school year. Girls receiving physical activity and nutrition education programs (PAN) were more likely to improve their fitness tests scores at all ages except the earliest. Girls receiving physical activity, nutrition education and changes in the school food environment to increase the nutritional content of foods served (PAEN) were significantly able to pass all fitness tests at all ages, and this was the only intervention that was successful at the youngest age group.

The results show that the fitness abilities of students at funded schools in testing performed at the start of the following school year are significantly better in schools implementing multivariate action plans. Figures IIIA, IIIB and IIIC demonstrate the greater effectiveness of multivariate approaches to improving the health status of elementary school aged children at all age levels. These figures show the results of testing completed:

- Prior to the implementation of programming as a baseline measure,
- After the completion of Year 1 programming to measure outcomes,
- At the start of the following school year to measure retention.

It is important to consider the long term effect of programming delivered in a school setting as this reflects the children's adoption of healthier lifestyle choices.

Please note that the scales on each figure are different to improve the readability. The higher scale range indicates the higher rates of the children ability to pass all tests.

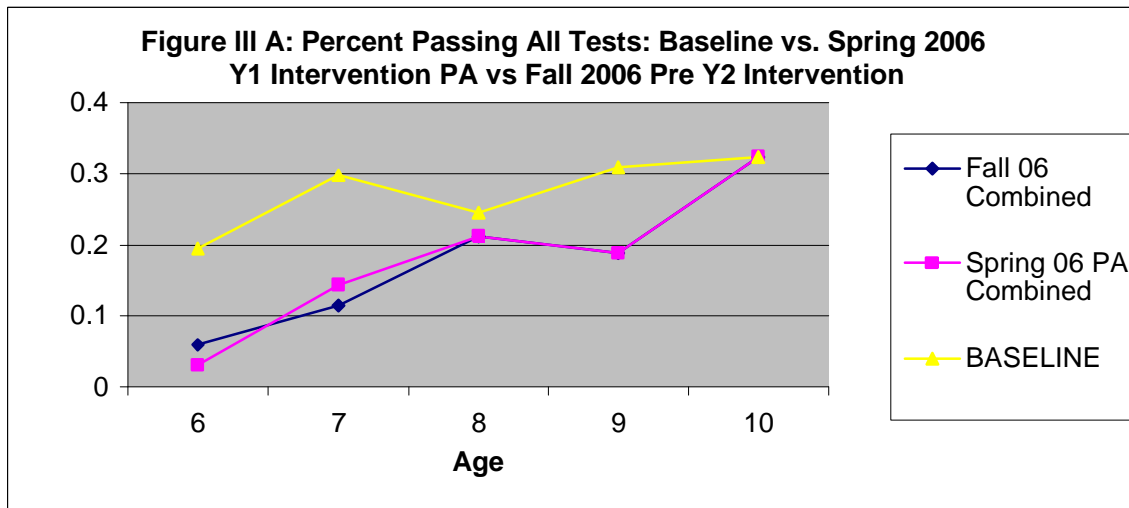


Figure IIIA shows that physical activity interventions alone were not effective as there is parity between all three testing cycles.

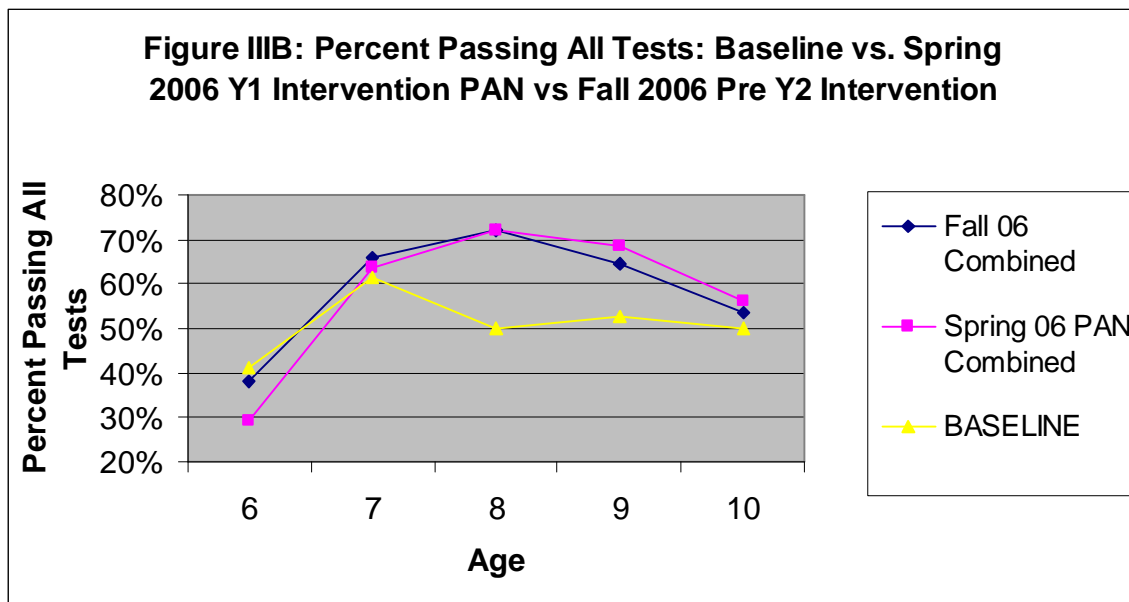


Figure IIIB shows that physical activity combined with nutrition education is significantly effective at all but the youngest age level and that the retention rate is very high. The ability to pass all fitness tests at the start of school in the Fall of the next year is almost equal at all ages to the tests performed at the end of the previous school year. Although these types of interventions were not as successful as the interventions that included improvement in the schools food environment, the students' retention rate is very satisfactory.

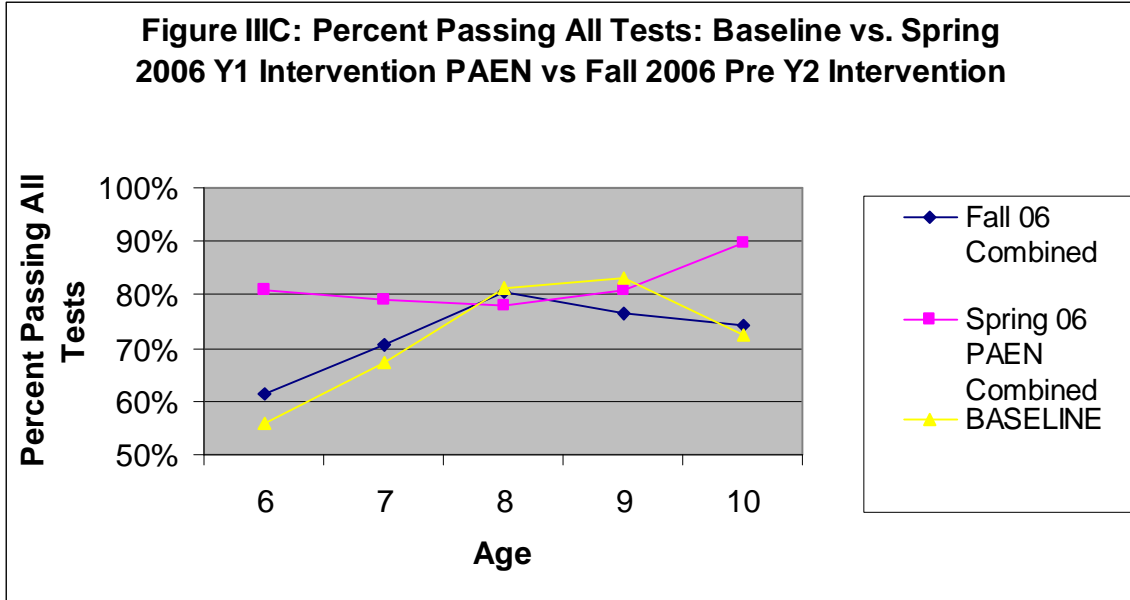


Figure IIIC shows that physical activity when combined with nutrition education and changes in the school food environment to increase the nutritional content of foods served is likely to be effective at all age levels, including the youngest, but less likely to be retained over the summer period when the children are not in school. It is important to note that children do not control the food environment that they are exposed to.

While it is unlikely that BMI improvement will be witnessed in the initial stages of a program, it is interesting to note that a pre and post measure if the children in the funded schools were encouraging as demonstrated in Figure IV.

**Figure IV: BMI Level Percentages of Students, Baseline vs. Funded**

	BOYS		GIRLS		
BMI Level	Baseline	End Y1	BMI Level	Baseline	End Y1
Underweight	1%	0%	Underweight	1%	1%
Normal	56%	60%	Normal	62%	65%
At Risk	22%	20%	At Risk	24%	21%
Overweight	22%	20%	Overweight	14%	14%

## Conclusion

Boys and girls at all ages in this study showed dramatic results. The children at the funded schools were much more likely to pass all Fitnessgram tests than their counterparts at unfunded control schools. **For children age five, the percent passing all tests was forty-four percentage points higher at funded schools than for children at unfunded control schools. For children age ten, the percent passing all tests was fifty-three percentage points higher at funded schools than for children at unfunded control schools**

## Next Steps

In year two four additional schools, three from the seacoast area in southern Maine and a middle school from the seacoast area in New Hampshire, will join the Seacoast Physical Best Program. As a result, ten schools will be implementing programs that address the three goals of the project:

- Increase opportunities for physical activity,
- Increase behavior focused nutrition education,
- Improve the nutritional content of foods served in the school environment.

All ten schools will participate in the Physical Best Program and have agreed to collect the age appropriate pre and post fitnessgram assessments for the Foundation to complete a year two evaluation report.

The original six schools are expanding their action plans in year two to test the replication of successful programs identified during year one. As part of the year two evaluation report the effectiveness of replicated programs in year two will be compared to their original effectiveness, as measured in year one.

## Acknowledgements

### Original Schools Year One:

Dondero School, Portsmouth, NH  
Greenland Central School, Greenland, NH  
Maude H. Trefethen Elementary School, New Castle, NH  
Newington Public School, Newington, NH  
North Hampton School, North Hampton, NH  
Rye Elementary School, Rye, NH

### Additional Schools Year Two:

Eliot Elementary School, Eliot Maine  
Kittery School Department, Kittery, Maine  
Rye Junior High School  
York School Department, York Maine

*We are grateful to Jacqui and Mike Bryan for their sponsorship of the Run, Pedal, Paddle (RPP) Race, to Action for Healthy Kids and the NH Healthy Schools Coalition for its oversight of the Physical Best training, data collection & analysis,, and to the RPP funding matches by Portsmouth Regional Hospital and the Foundation for Seacoast Health.*