



The  
**Cooper Institute**<sup>®</sup>  
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Texas Youth Fitness Project  
(SY2011 to SY2014)  
Executive Summary

**FITNESSGRAM**<sup>™</sup>

## Texas Youth Fitness Project Executive Summary

FITNESSGRAM data have been compiled from schools all over Texas but patterns have not been systematically examined since the original results were summarized (2007/2008). The present report summarizes results of analyses over the last four academic school years (2010/2011, 2011/2012, 2012/2013, and 2013/2014). Direct comparisons with past data are not appropriate since the FITNESSGRAM standards for aerobic capacity and body composition were updated in 2010 and 2013<sup>1</sup>. The raw data provided from the Texas Education Association were first processed and cleaned to ensure that the submitted results were representative of the individual schools. The total number of schools submitting data were tracked along with the total number of student records. The summary below shows the total numbers of schools that submitted data along with the total number of student records. The numbers used in the analyses (following data screening) are also provided for each year of testing.

- 2011: 7,000 schools (2,922,851 youth). Final sample included 6,798 schools (2,902,854 youth)
- 2012: 6,421 schools (2,287,518 youth); Final sample included 6,251 schools (2,269,481 youth)
- 2013: 6,374 schools (4,055,099 youth); Final sample included 6,228 schools (4,039,365 youth)
- 2014: 6,123 schools (3,283,569 youth); Final sample included 5,943 schools (3,264,390 youth)

This executive summary provides brief summaries of key findings from the analyses of these data. Summaries are provided below in three key areas: 1. Patterns of Fitness Achievement, 2. Changes in Fitness Achievement Over Time (2011-2014), 3. Associations between Fitness Achievement and Academic Achievement. Detailed summaries of these reports are provided in separate research reports.

### 1. Patterns of Fitness Achievement

The Healthy Fitness Zone (HFZ) in FITNESSGRAM was established to reflect the amount of fitness needed for good health. The standards vary by age and gender to take into account differences in growth and maturation. The percent of students that achieve the HFZ provides a useful indicator of the status of youth fitness and physical education programming in the state. The results show that the majority of Texas youth achieved the HFZ levels for most tests. However, the patterns vary by test as well as by age and gender (See [Figure 1](#)). In general, boys had slightly higher rates of achieving the HFZ on Aerobic Capacity<sup>2</sup>, Upper Body Strength & Endurance, and Abdominal Strength & Endurance assessments. Girls, on the other hand, had higher rates of achievement in Body Composition<sup>3</sup>, Flexibility, and Trunk Extensor Strength & Flexibility. Comprehensive reports with age

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<sup>1</sup> All data included in this report were compared using FITNESSGRAM v9 standards.

<sup>2</sup> AC data for SY2013-2014 includes data submitted to the Texas Education Agency via the Physical Fitness Assessment Initiative (approximately 2,400,000 youth; 2/3 of Texas students), AC data submitted using the FITNESSGRAM Version 10 software were excluded to prevent comparisons of AC data using different health-related fitness standards and/or calculations.

<sup>3</sup> Higher rates of Healthy Fitness Zone achievement in body composition, equates to more students having a healthy body composition for their age and gender.

and gender patterns are provided in the more detailed statistical report (*Levels of Health-Related Physical Fitness in Texas School Children (2011 to 2014)*).

### **Achievement in Schools that Reported Across all Four Years (2011 to 2014):**

Approximately forty percent of Texas schools consistently submitted FITNESSGRAM scores four consecutive years from 2011 to 2014. For most fitness components, an overall positive trend in fitness achievement was observed. Slight increases were evident in average HFZ achievement for aerobic capacity (boys 83.7% in 2011 to 88% in 2014; girls 78.5% in 2011 to 84% in 2014), body composition (boys 51.3% in 2011 to 52.4% in 2014; girls 55.8% in 2011 to 57.0% in 2014), abdominal strength & endurance (boys 80.6% in 2011 to 80.6% in 2014; girls 78.7% in 2011 to 79.2% in 2014), upper body strength & endurance (boys 74.1% in 2011 to 74.7% in 2014; girls 69.7% in 2011 to 71.5% in 2014), and flexibility (boys 66.4% in 2011 to 66.9% in 2014; girls 71.0% in 2011 to 71.4% in 2014). A slight plateau of HFZ achievement was observed for trunk extensor strength and flexibility (boys 86.2% in 2011 to 85.9% in 2014; girls 88.2% in 2011 to 88.5% in 2014). See [Figure 2](#) for patterns of achievement in the cohort of consistently reporting schools.

Figures showing the general patterns of HFZ achievement for all schools each year are provided at the end of the report by fitness component (**See Figures 3a, 4a, 5a, 6a, 7a, and 8a**). For descriptive purposes, the ranges of HFZ achievement for boys and girls from 3<sup>rd</sup> to 12<sup>th</sup> grade are summarized below (SY2013-2014):

#### Girls:

- Aerobic Capacity (range<sup>4</sup>: 73.8%-89.2%)
- Body Composition (range: 53.4%-69.3%)
- Upper Body Strength & Endurance (range: 67.0%-79.6%)
- Abdominal Strength & Endurance (range: 76.2%-81.3%)
- Flexibility (range: 68.0%-75.3%)
- Trunk Extensor Strength & Flexibility (range: 81.9%-92.4%)

#### Boys:

- Aerobic Capacity (range: 72.4%-93.0%)
- Body Composition (range: 48.9%-59.5%)
- Upper Body Strength & Endurance (range: 70.4%-76.9%)
- Abdominal Strength & Endurance (range: 77.9%-82.5%)
- Flexibility (range: 61.2%-72.7%)
- Trunk Extensor Strength & Flexibility (range: 78.6%-91.2%)

## **2. Changes in Fitness Achievement over Time (2011 to 2014)**

The changes in fitness achievement over time provide an indicator of whether fitness levels are improving across the state. The rates of achieving the HFZ on the various assessments have generally increased over the past four years – providing evidence of increasing levels of fitness achievement

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<sup>4</sup> Range represents average Healthy Fitness Zone achievement among grades 3<sup>rd</sup> to 12<sup>th</sup> for SY 2013-2014

over time. However, the overall patterns vary by test, as well as by age and gender. Slight improvement in achieving the HFZ were evident for body composition (boys 1.9%; girls 2.0%), aerobic capacity (boys 5.6%; girls 8.9%), upper body strength & endurance (boys 1.9%; girls 3.0%), abdominal strength & endurance (boys 0.7%; girls 1.2%), and flexibility (boys 3.2%; girls 4.3%), while a slight decrease was observed in trunk extensor strength and flexibility (boys -0.6%; girls 0.0%). However, increases for boys and girls in high school were observed for each component. Figures showing the changes for each fitness test are provided at the end of this report by grade level (See **Figures 3b, 4b, 5b, 6b, 7b, and 8b**). To assist in interpretation, the overall school level changes from 2011 to 2014 in achievement are summarized below along with the average changes for elementary, middle and high school grades.

Boys:

- Aerobic Capacity (Overall % change = 6.6%, Elementary: 2.4%, Middle: 6.6%, High: 12.3%)
- Body Composition (Overall % change = 1.9 %, Elementary: 2.3 %, Middle: 3.0%, High: 0.5%)
- Upper Body Strength & Endurance (Overall % change =1.9%, Elementary: -1.9%, Middle: 1.4 %, High: 12.1%)
- Abdominal Strength & Endurance (Overall % change = 0.7%, Elementary: -1.4%, Middle: -0.8%, High: 7.8%)
- Flexibility (Overall % change = 1.0%, Elementary: -2.0%, Middle: 1.1%, High: 9.5%)
- Trunk Extensor Strength & Flexibility (Overall % change = -0.6%, Elementary: -1.2%, Middle: -0.3%, High: 1.2%)

Girls:

- Aerobic Capacity (Overall % change = 7.2%, Elementary: 4.5%, Middle: 9.9%, High: 6.5%)
- Body Composition (Overall % change = 2.0%, Elementary: 1.8%, Middle: 1.5%, High: 4.2%)
- Upper Body Strength & Endurance (Overall % change = 3.0%, Elementary: -0.8%, Middle: 3.4%, High: 13.2%)
- Abdominal Strength & Endurance (Overall % change = 1.2%, Elementary: -1.4%, Middle: -0.3%, High: 9.7%)
- Flexibility (Overall % change = 1.1%, Elementary: -1.0%, Middle: 1.0%, High: 6.8%)
- Trunk Extensor Strength & Flexibility (Overall % change = 0.0%, Elementary: -0.4%, Middle: 0.1%, High: 1.6%)

See [Figure 9](#) for the overall percent difference in HFZ achievement by gender (SY2011 to SY2014).

### 3. Associations between Fitness Achievement and Academic Achievement

The compiled school level data on physical fitness provides a useful way to examine associations with academic achievement and other indicators of school performance (e.g., attendance). This report summarizes the pattern of associations observed between health-related physical fitness and academic achievement using four years of data from the Texas Education Agency. The report also summarizes patterns of associations between fitness and attendance. The analyses used aggregated school-level outcomes (i.e., average % of youth achieving the HFZ, average % of youth achieving the academic

standards, and average school attendance rates). The focus of these analyses was on two specific health-related fitness assessments [aerobic capacity (AC) and body composition (BC)] because these assessments are expected to have stronger associations. A unique aspect of the analyses is that the results controlled for other school level variables that may influence the results (e.g., school socioeconomic status). Consistent with past research in Texas (and other literature), the resulting associations were in the low to moderate range but consistently in the positive direction. This indicates small but noteworthy associations between school-level fitness achievement and other school indicators. Detailed summaries of these analyses are provided in the comprehensive report (*Associations between Health-Related Fitness and Academic Achievement (2011 to 2014)*). The results of the analyses provide continued evidence supporting links between health-related fitness and academic achievement (as well as modest associations with attendance). However, the varied relationships make it difficult to draw definitive conclusions. Additional research with individual measures offers potential to better understand the relationships. Some general summaries are provided below.

- Associations (i.e., correlations) with academic achievement are strongest in middle school students (6th to 8th graders) compared to elementary school students.
  - Associations were generally larger for body composition (compared to aerobic capacity)
  - Associations were the strongest between body composition and math achievement in girls
- Associations (i.e., correlations) between aerobic capacity and attendance were generally in the moderate range (.3-.4) but no patterns were evident with body composition. The patterns varied by the tests being compared as well as by age and gender. Associations were generally higher in boys than girls but age-related patterns were not evident.

### **Summary**

The results from the ongoing evaluation provide valuable insights about patterns and trends in health-related fitness in the state. It is important to note that this report is only intended to summarize the overall patterns in the data. Detailed statistical tests are needed to infer if the differences are statistically significant or to identify whether variability in achievement is due to real trends in the data or due to other factors. Due to changes in software and changes in the samples of schools in each year, it is difficult to identify any trends. The most robust conclusions are drawn from samples of schools that contributed data in all years and with the same version of the software. Specific analyses (and additional information) are also needed to examine the variability that exists within the state with regard to fitness achievement since patterns vary by school, district and county.

## Executive Summary Figures

[Figure 1. Average Healthy Fitness Zone achievement by year and gender from SY2011 to SY2014.](#)

[Figure 2. Healthy Fitness Zone achievement, by gender in a cohort of schools that consistently reported FITNESSGRAM scores each year from SY2011 to SY2014.](#)

[Figure 3a. Average aerobic capacity Healthy Fitness Zone achievement by year and gender](#)

[Figure 3b. Percent difference in aerobic capacity Healthy Fitness Zone achievement by gender and school level \(SY2011 to SY2014\).](#)

[Figure 4a. Average body composition Healthy Fitness Zone achievement by year and gender.](#)

[Figure 4b. Percent difference in body composition Healthy Fitness Zone achievement by gender and school level \(SY2011 to SY2014\).](#)

[Figure 5a. Average upper body strength & endurance Healthy Fitness Zone achievement by year and gender.](#)

[Figure 5b. Percent difference in upper body Healthy Fitness Zone achievement by gender and school level \(SY2011 to SY2014\).](#)

[Figure 6a. Average abdominal strength & endurance Healthy Fitness Zone achievement by year and gender.](#)

[Figure 6b. Percent difference in abdominal strength & endurance Healthy Fitness Zone achievement by gender and school level \(SY2011 to SY2014\).](#)

[Figure 7a. Average flexibility Healthy Fitness Zone achievement by year and gender.](#)

[Figure 7b. Percent difference in flexibility Healthy Fitness Zone achievement by gender and school level \(SY2011 to SY2014\).](#)

[Figure 8a. Average trunk extensor strength & flexibility Healthy Fitness Zone achievement by year and gender.](#)

[Figure 8b. Percent difference in trunk extensor strength & flexibility Healthy Fitness Zone achievement by gender and school level \(SY2011 to SY2014\).](#)

[Figure 9. Overall percent difference in Healthy Fitness Zone achievement, by gender \(SY2011 to SY2014\)](#)

**See Figures below that summarize overall patterns of fitness.**

**Additional information is provided in the detailed reports:** *Associations between Health-Related Fitness and Academic Achievement (2011 to 2014)* and *Levels of Health-Related Physical Fitness in Texas School Children (2011 to 2014)*.

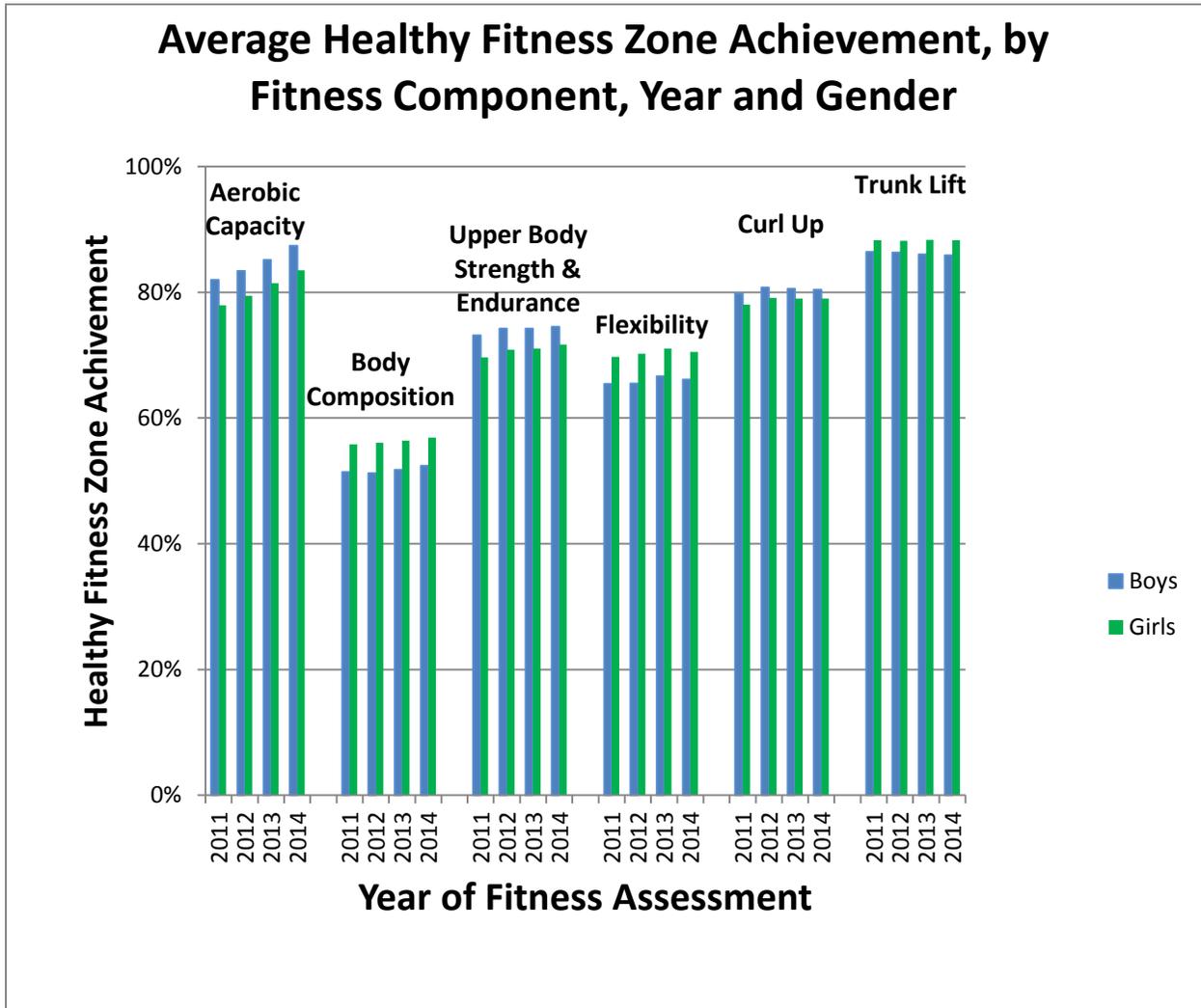


Figure 1. Average Healthy Fitness Zone achievement by year and gender from SY2011 to SY2014.

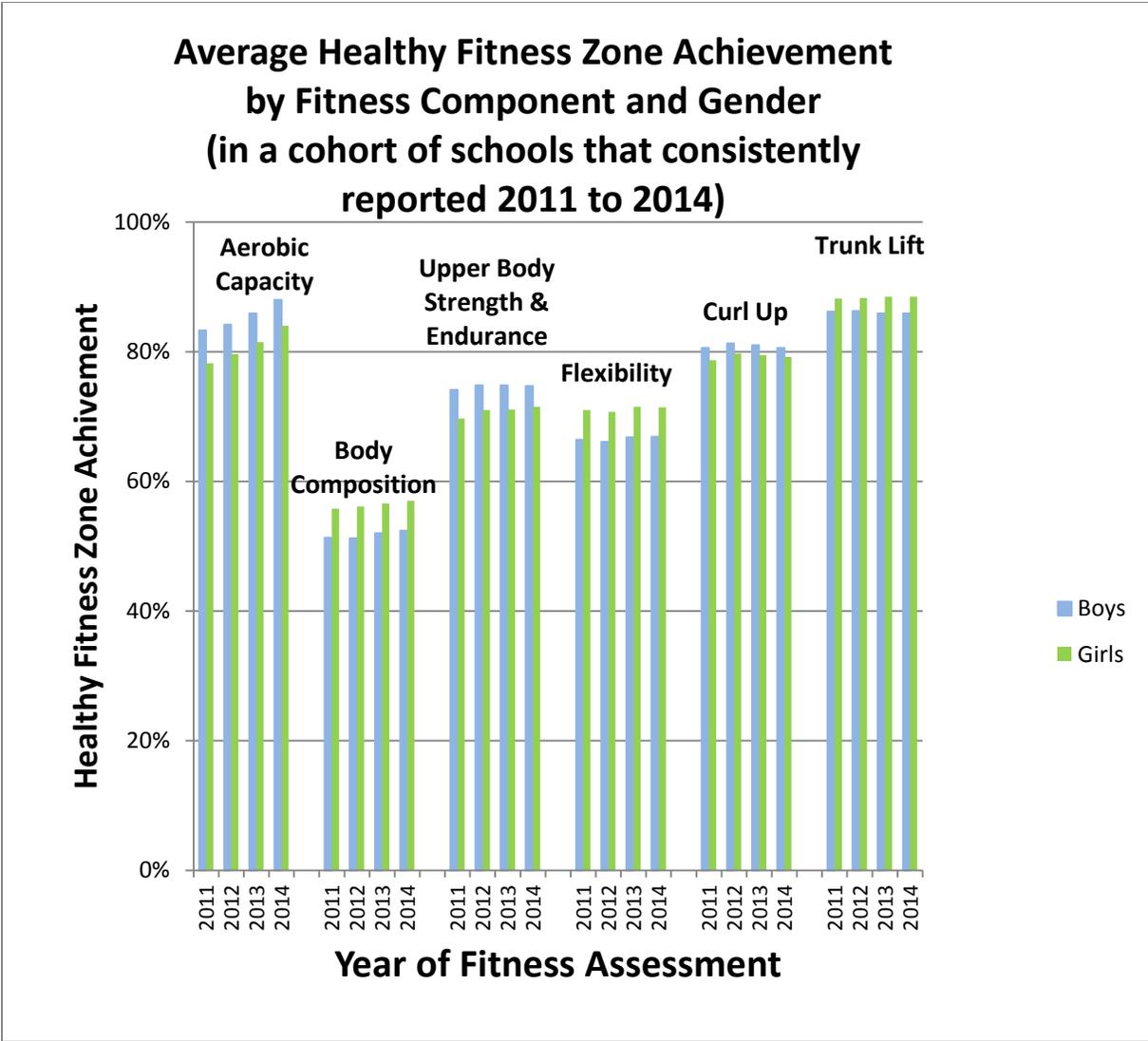


Figure 2. Healthy Fitness Zone achievement by gender in a cohort of schools that consistently reported FITNESSGRAM scores each year from SY2011 to SY2014.

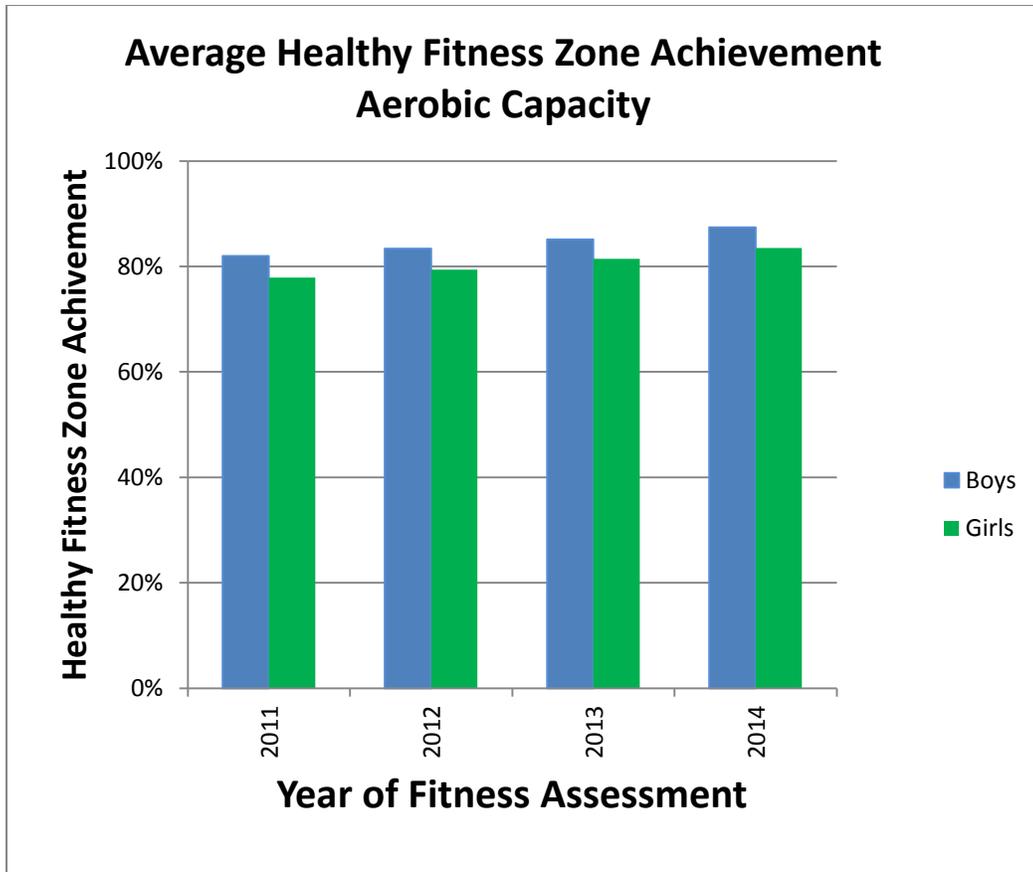


Figure 3a. Average aerobic capacity Healthy Fitness Zone achievement by year and gender.

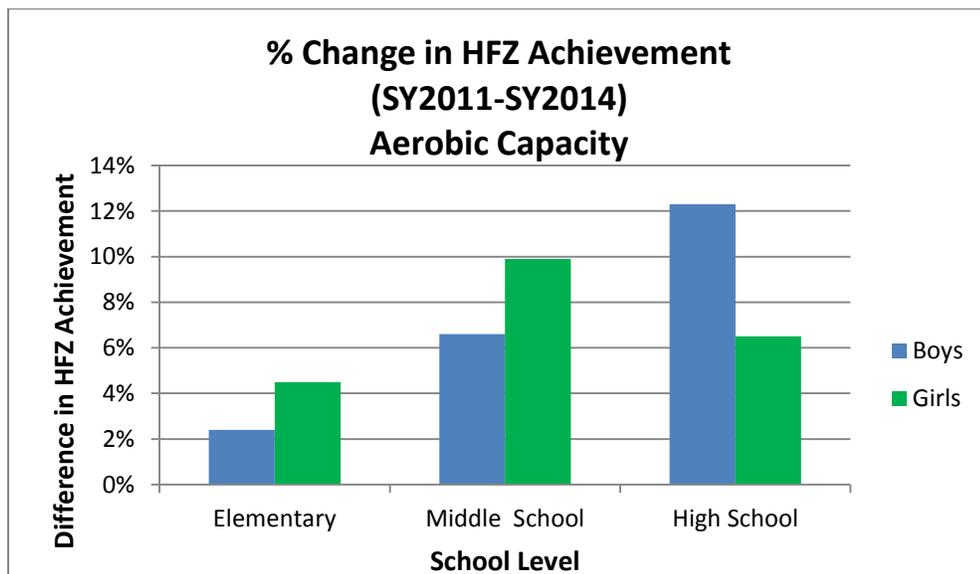


Figure 3b. Percent Difference in aerobic capacity Healthy Fitness Zone achievement by gender and school level (SY2011 to SY2014).

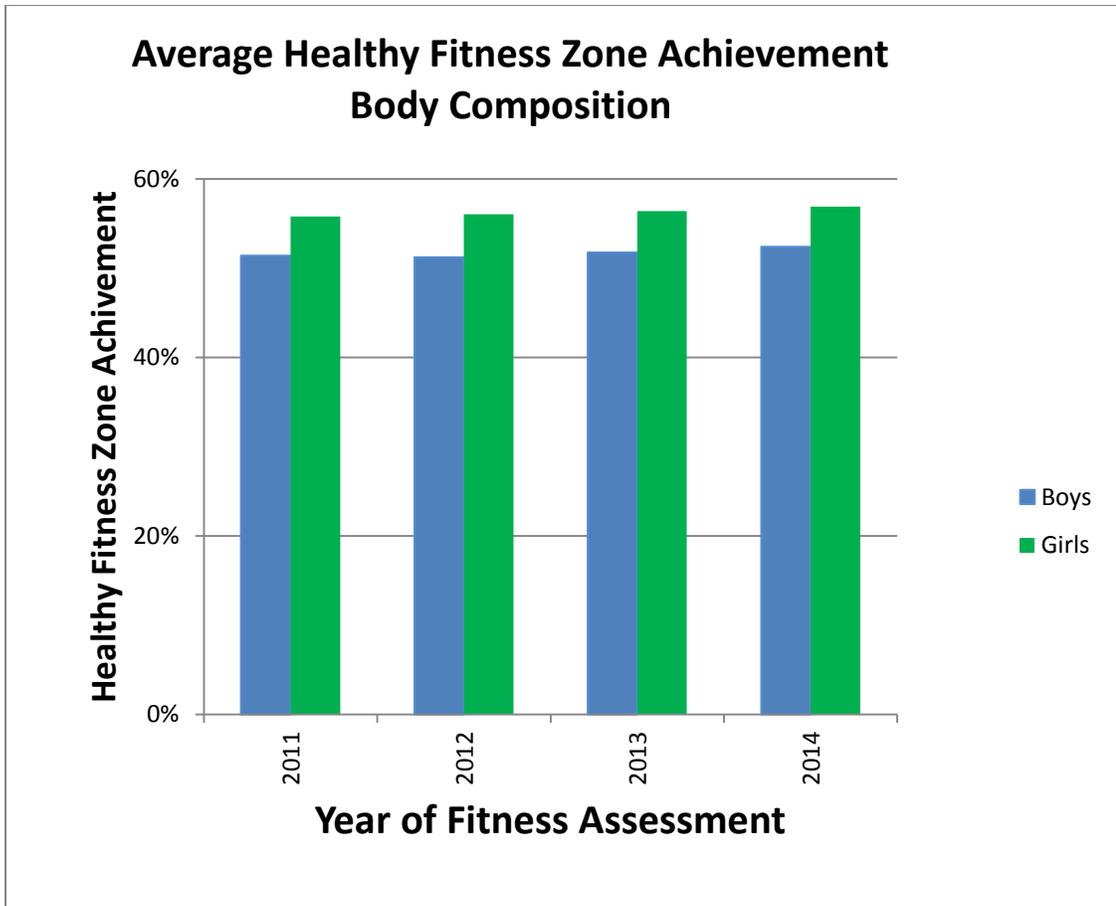


Figure 4a. Average body composition Healthy Fitness Zone achievement by year and gender.

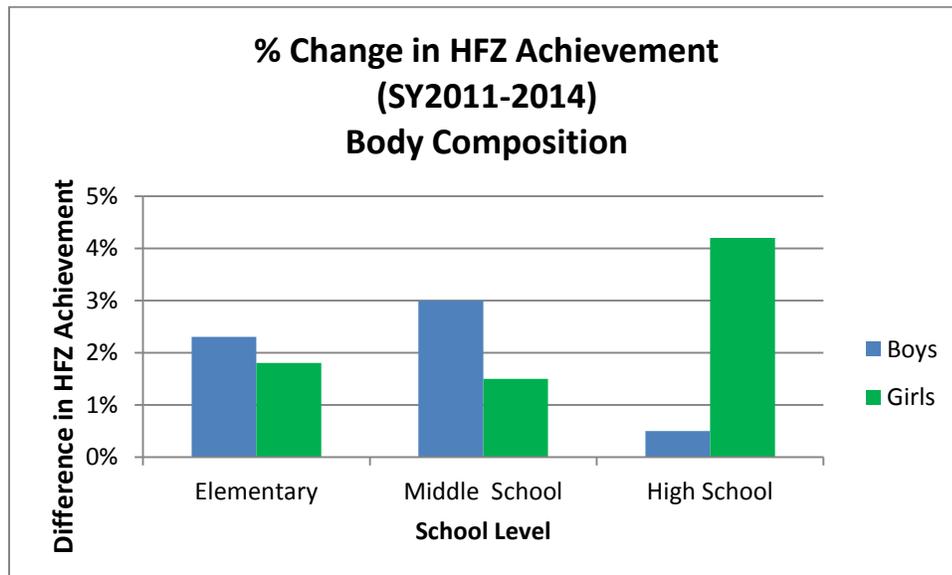


Figure 4b. Percent difference in body composition Healthy Fitness Zone achievement by gender and school level (SY2011 to SY2014).



Figure 5a. Average upper body strength & endurance Healthy Fitness Zone achievement by year and gender.

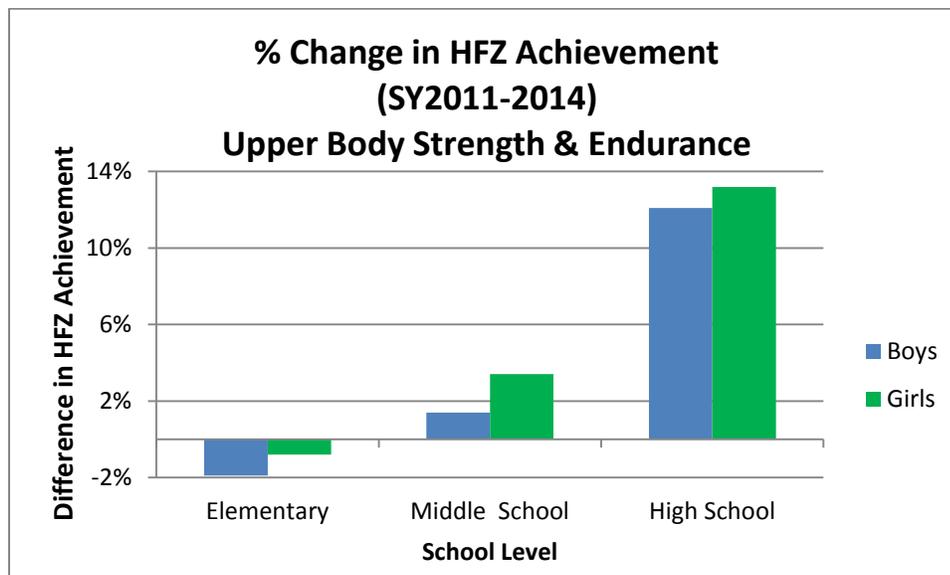


Figure 5b. Percent difference in upper body Healthy Fitness Zone achievement by gender and school level (SY2011 to SY2014).

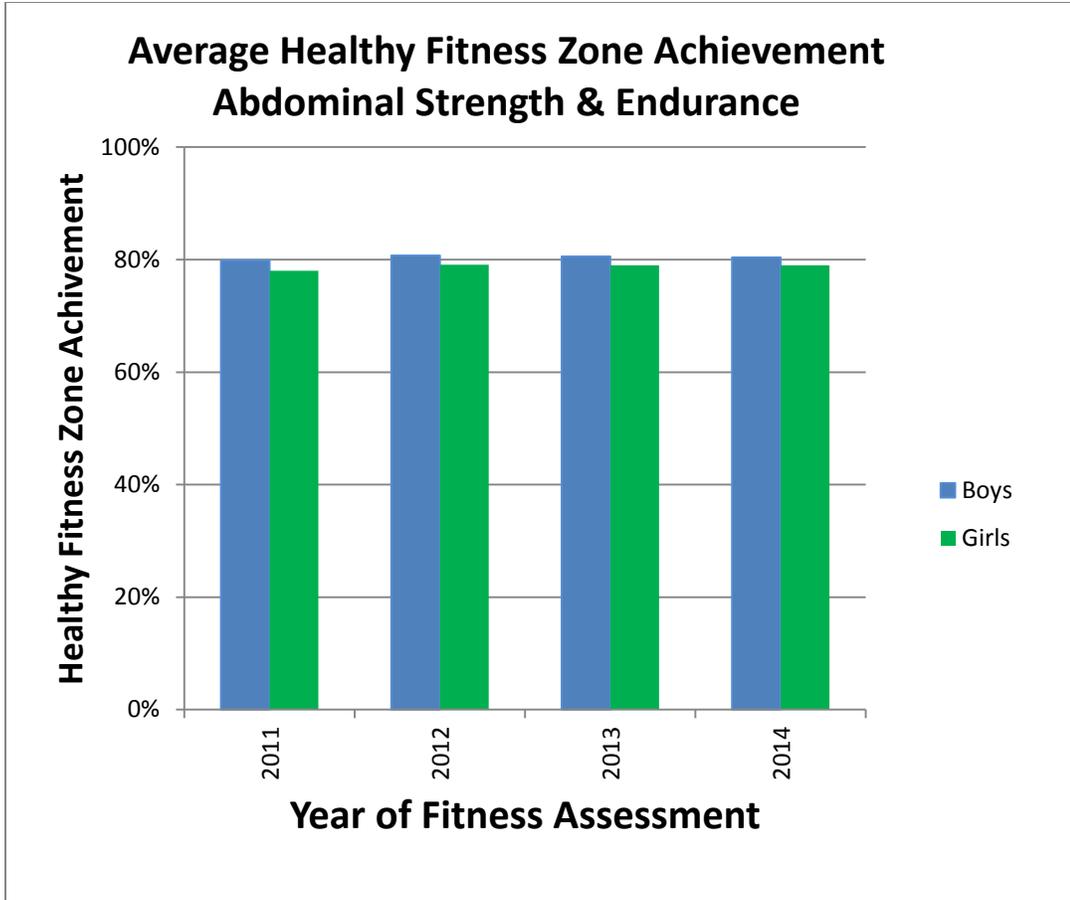


Figure 6a. Average abdominal strength & endurance Healthy Fitness Zone achievement by year and gender.

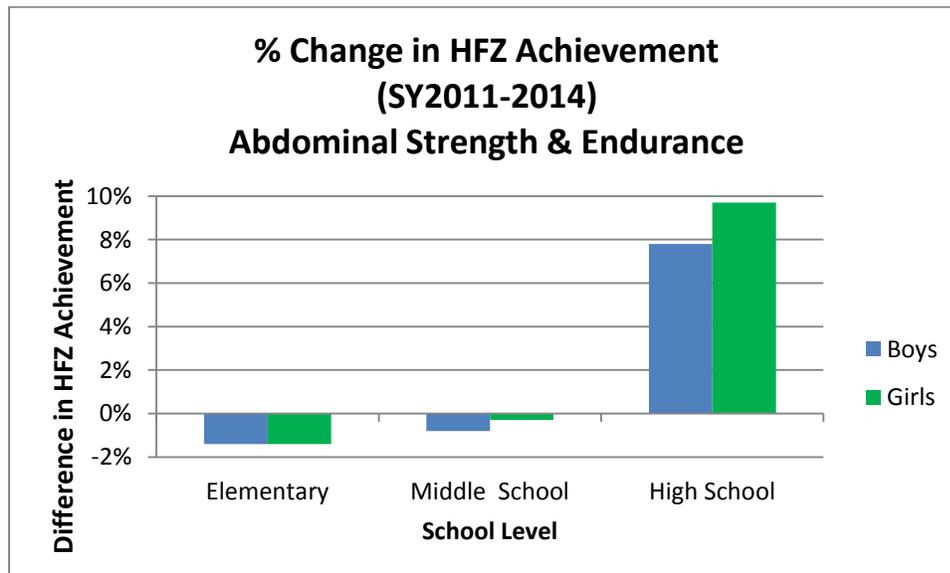


Figure 6b. Percent difference in abdominal strength & endurance Healthy Fitness Zone achievement by gender and school Level (SY2011 to SY2014).

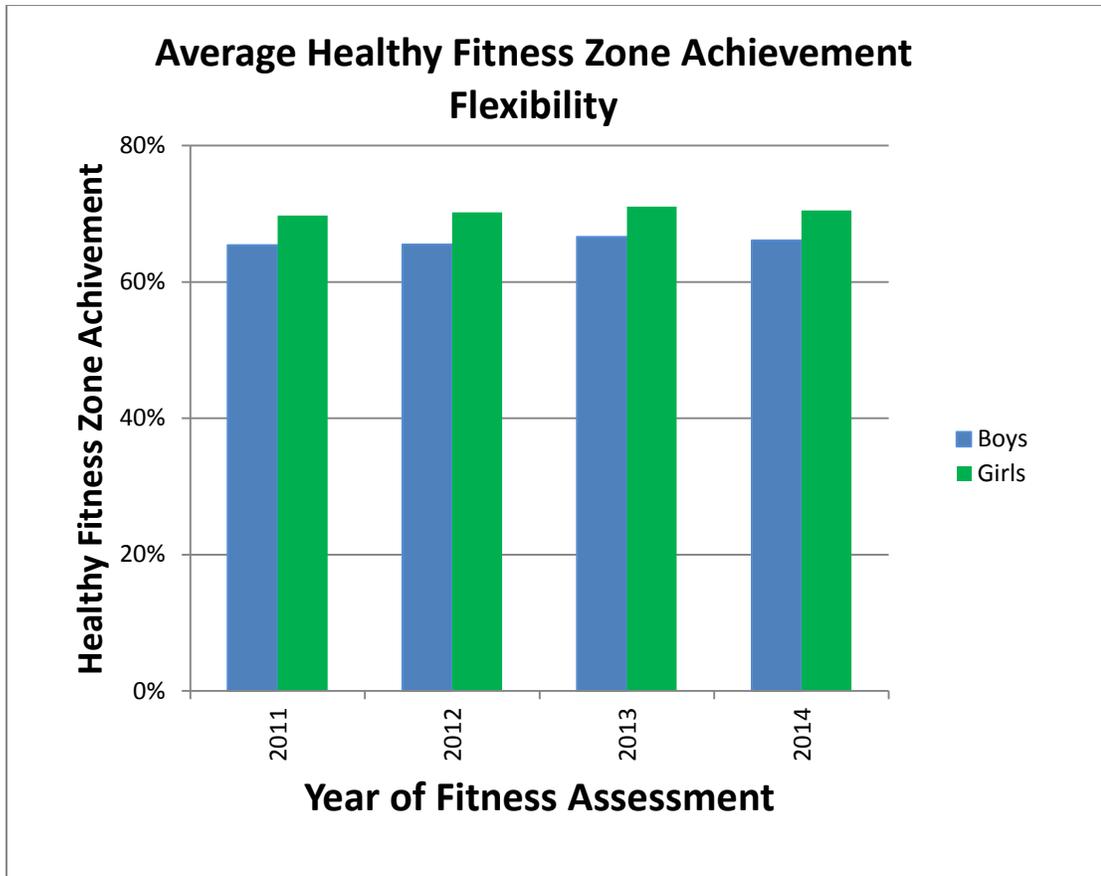


Figure 7a. Average flexibility Healthy Fitness Zone achievement by year and gender.

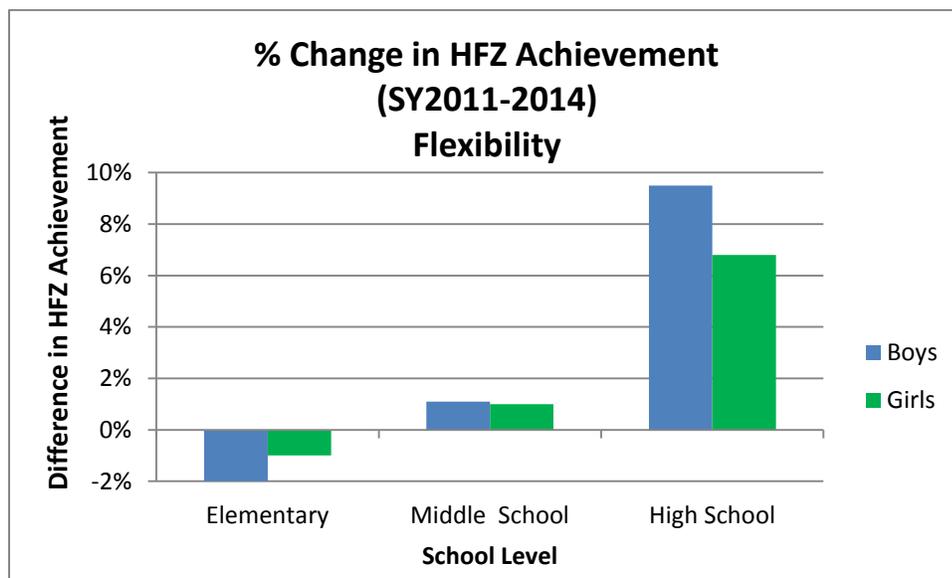


Figure 7b. Percent difference in flexibility Healthy Fitness Zone achievement by gender and school level (SY2011 to SY2014).

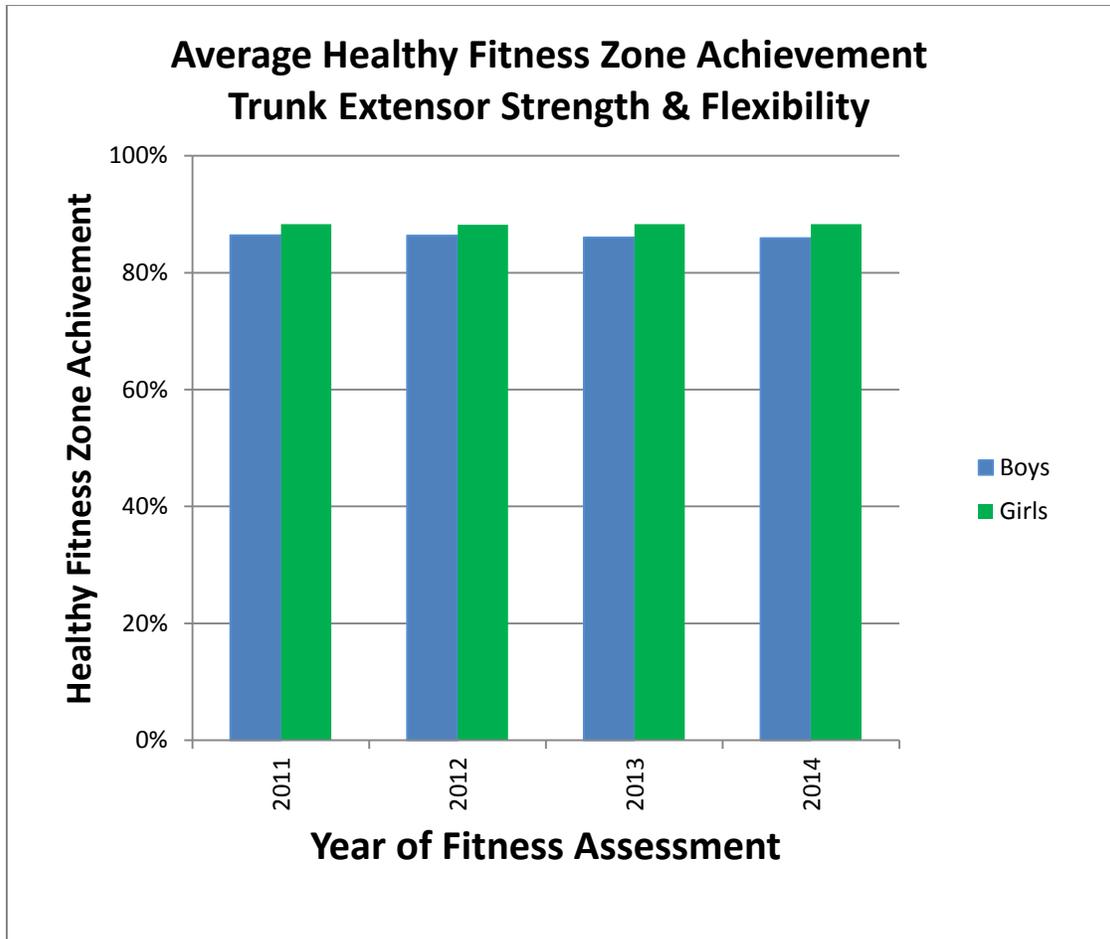


Figure 8a. Average trunk extensor strength & flexibility Healthy Fitness Zone achievement by year and gender.

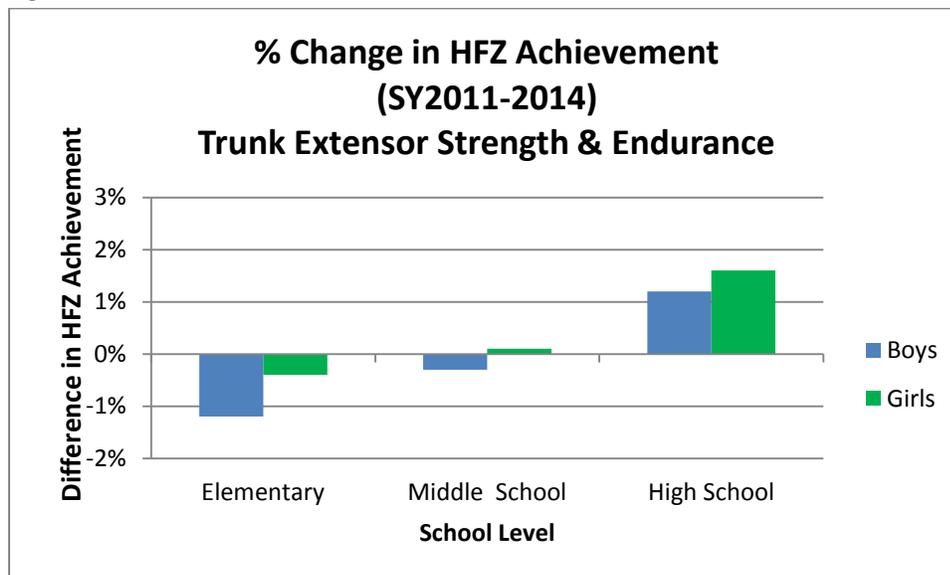


Figure 8b. Percent difference in trunk extensor strength & flexibility Healthy Fitness Zone achievement by gender and school level (SY2011 to SY2014).

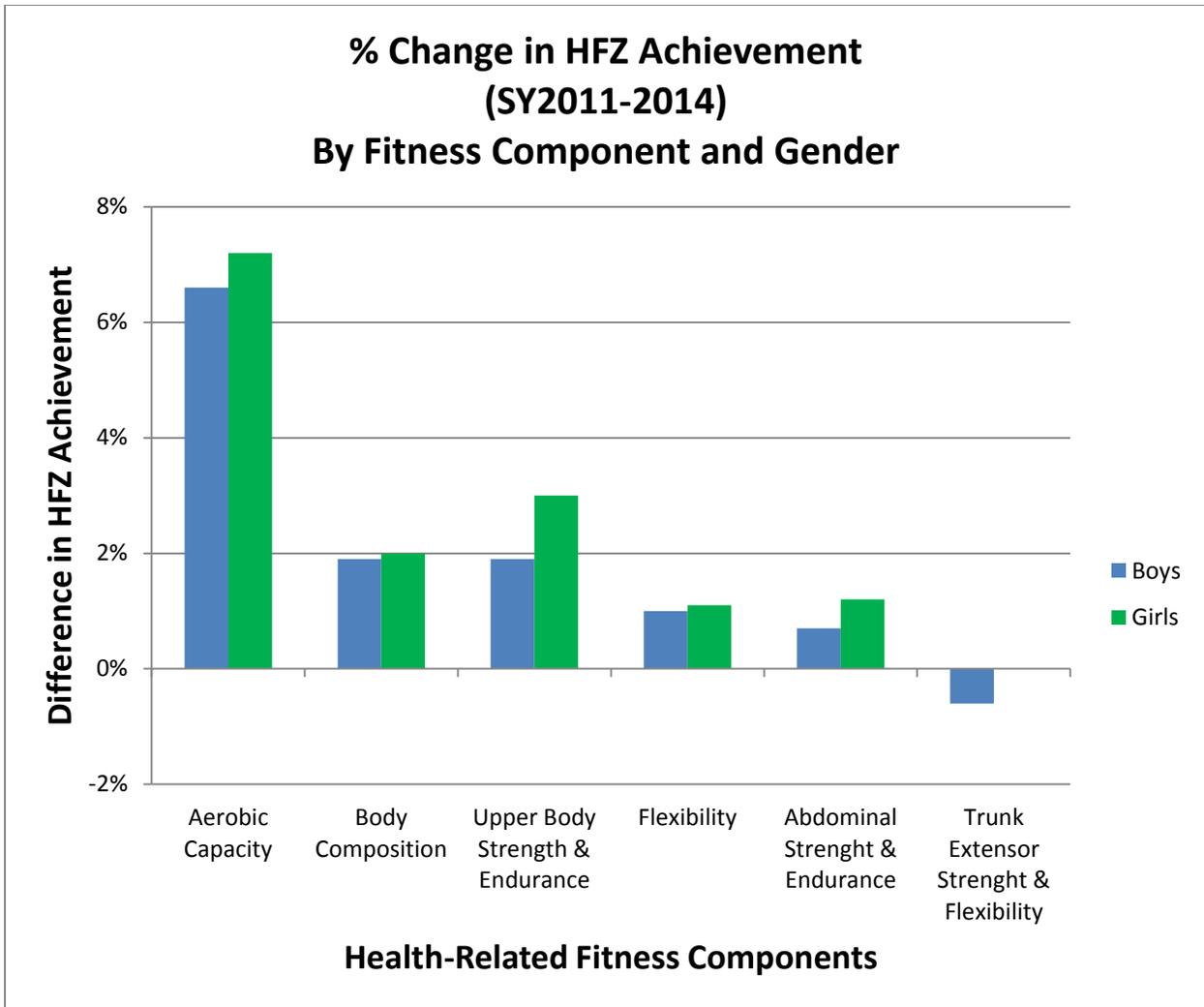


Figure 9. Overall percent difference in Healthy Fitness Zone achievement by gender (SY2011 to SY2014).