Active People, Healthy Nation^{SM}: Measuring 27 Million

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Introduction

Active People, Healthy Nation is a national initiative, coordinated by the Centers for Disease Control and Prevention (CDC), to increase the physical activity levels of 27 million Americans by 2027. This goal represents a doubling of the Healthy People 2020 goals that were in place in 2020 when this initiative was launched.[1] To be successful, 2.5 million high-school students and 25 million adults will increase their activity levels between 2020 and 2027. This document explains how Active People Healthy Nation will measure the 27 million goal from 2020 to 2027.

Measurement Methods: Adults

Data Source and Timing

Ideally, Active People, Healthy Nation would track a sample of people across time to estimate how many increase their activity level over time. However, because such data are not available nationally, the numbers will be estimated from serial cross-sectional sources. To track progress among adults, Active People, Healthy Nation (Active People) will use data from the National Health Interview Survey (NHIS). NHIS is a nationally representative health survey conducted annually by CDC's National Center for Health Statistics. Full details of NHIS methods are available from the National Center for Health Statistics.[2]

In 2020, NHIS implemented an updated physical activity questionnaire to be administered every other year and is not comparable to previous years. Therefore, for adult physical activity, 2020 will be the baseline year, with updated data available for 2022, 2024, 2026, and 2028. Data from NHIS is typically released in the summer of the year following data collection (e.g., 2022 data will be available summer 2023). Prevalence for 2027 will be estimated retroactively as the average of estimates from 2026 and 2028.

Leveling up or down

Active People, Healthy Nation's goal is to increase the number of people that meet the Physical Activity Guidelines for Americans, second edition[3] (PAG) recommendations for aerobic physical activity. The PAG for Americans recommends that adults move more and sit less because some physical activity is better than none and that adults do at least 150 minutes of moderate aerobic physical activity, 75 minutes of vigorous activity, or an equivalent combination of moderate and vigorous physical activity for

substantial health benefits. The adult PAG also include recommendations for muscle strengthening activity, but Active People, Healthy Nation focuses only on aerobic activity.

Active People, Healthy Nation creates three categories to measure the degree to which people are "leveling up".

1. **Physically inactive**: this measure the proportion of people who are completely inactive and represents what the PAG recognizes as unhealthy behavior.
2. **Insufficiently active**: this measures the proportion of people who are doing some aerobic activity but not meeting the PAG recommended amount. These are people who are getting some health benefits from physical activity but not as much benefit as they would get if they met PAG for aerobic physical activity.
3. **Active**: this measures the proportion of people meeting the PAG guideline for aerobic physical activity and is a level with ample evidence of substantial wide-ranging health benefits.

Active People's goal is for the population people to "level up" and measures the proportion of the population in each of these three categories.

Calculation of changes
Baseline year (2020)
Active People, Healthy Nation will use the following steps to calculate the baseline estimates of adult physical activity.

1. Obtain the non-institutionalized adult population as the weighted total adult sample size from NHIS (not just those with complete physical activity data). This is the **standard, baseline population** for all adult change estimates moving forward (n=252,052,048).
2. Determine the proportion of adults at each level of activity: inactive, insufficiently active, and active, along with 95% confidence intervals (CIs) following NHIS analytic guidelines. These estimates will not be standardized for age or any other demographic factors (i.e., **unadjusted** estimates).
3. Multiply the proportion at each level of activity in #2 by the total population from #1. This yields the estimated number of adults at each level of activity.

Update Years (2022, 2024, 2026, 2028)
The following steps will be used to estimate changes in each update year relative to physical activity in the baseline year of 2020. All comparisons will be between the given update year and 2020.

1. Append the data from the update year to the dataset used above for baseline year calculations. The "year" variable will be the stratification variable for the analyses below.

2. Determine the unadjusted proportion of adults inactive, insufficiently active, and active, along with 95% CIs, following NHIS analytic guidelines, stratified by year.

3. After estimating the proportions in #2, use post-estimation linear contrast statements to estimate differences in proportions, including Wald tests to determine if the magnitude of any observed difference is greater than zero.

   a. Inactive

      i. Subtract the proportion inactive in the update year from the proportion inactive in 2020 and note the Wald test p-value

         1. **No Change:** If the p-value is ≥0.05, there was no statistically significant change in inactivity, so change = 0

         2. **Decrease in Inactivity:** If the p-value is <0.05 and the result is positive-signed, there was a decrease in inactivity (desired)

         3. **Increase in Inactivity:** If the p-value is <0.05 and the result is negative-signed, there was an increase in inactivity (not desired)

      ii. If there is a decrease or increase in inactivity, the proportion in 3.a.i.2 or 3.a.i.3 will be multiplied by the 2020 baseline population (252,052,048). Round to the nearest whole number

         1. A positive number represents a decrease in inactivity

         2. A negative number represents an increase in inactivity

   b. Active (i.e., meeting the aerobic guideline)

      i. Subtract the proportion active in 2020 from the proportion active in the update year and note the Wald test p-value

         1. **No Change:** If the p-value is ≥0.05, there was no statistically significant change in the proportion active, so change = 0

         2. **Increase in the proportion active:** If the p-value is <0.05 and the result is positive-signed, there was an increase in the proportion active (desired)

         3. **Decrease in the proportion active:** If the p-value is <0.05 and the result is negative-signed, there was a reduction in the proportion active (not desired)

  ii. If there was an increase or decrease in the proportion active, the difference in proportions in 3.b.i.2 or 3.b.i.3 will be multiplied by the baseline population (252,052,048) and rounded to the nearest whole number.

   1. A positive number represents an increase in the proportion active

   2. A negative number represents a decrease in the proportion active

 c. Add the results of the inactivity calculation (3.a.ii) and the proportion active calculation (3.b.ii) to obtain the net total number of adults leveling up

Note that no calculation is needed for insufficiently active. Relying on repeated, cross-sectional data has limitations and requires the assumption that moving from one activity level to another occurs in a stepwise manner. For example, decreases in inactivity are assumed to be due to inactive adults becoming insufficiently active, not fully active. Under this assumption, changes in the proportion insufficiently active are captured in changes in the proportion inactive and active. See the limitations section for a more complete description and examples.

The final year of Active People, Healthy Nation is 2027, but physical activity data will not be collected in NHIS that year. To estimate the prevalence of the three levels of physical activity for 2027, the average of 2026 and 2028 estimates will be calculated using non-linear, postestimation combinations. This result can then be applied at step 2 in the process outlined above.

Measurement Methods: Youth

Data Source and Timing

To track progress among youth, CDC will use estimates from the national Youth Risk Behavior Survey (YRBS), which is a component of the Youth Risk Behavior Surveillance System. YRBS provides representative data for 9th through 12th grade students in US public and private high schools. Details of the YRBS are available from CDC.[3] The YRBS is administered during odd-numbered years. Data are usually available approximately one year after data collection ends (e.g. 2021 data would usually be available in late 2022 but was delayed to early 2023 due to delays resulting from the COVID-19 pandemic). For Active People, Healthy Nation, 2019 will be the baseline year.

'Leveling Up'

The Physical Activity Guidelines for Americans, second edition[3], recommends children and adolescents aged 6 through 17 do 60 minutes or more of moderate-to-vigorous physical activity daily, with three types of activity recommended: aerobic, muscle strengthening, and bone strengthening. Active People, Healthy Nation will focus only on the recommendation that most of the daily 60 minutes should be moderate or vigorous-intensity aerobic physical activity. Unlike adults, there is no recommendation to avoid inactivity by 'moving more and sitting less'. Therefore, there is no 'insufficient' activity level for children and adolescents, and the two activity levels for youth include:

1. Not meeting the aerobic guideline: youth who report less than 60 minutes per day or less than daily frequency.
2. Meeting the aerobic guideline: youth who report ≥60 minutes per day, every day.

For Active People, Healthy Nation, moving from 'not meeting the aerobic guideline' to 'meeting the aerobic guideline' is 'leveling up.' Conversely, moving from meeting to not meeting is 'leveling down', and is counter to the goals of the initiative.

Calculation of Changes

Baseline Year

Active People, Healthy National will use the following steps to calculate the 2019 baseline estimates of youth physical activity.

1. Obtain the estimated number of enrolled US high school students (grades 9-12) from the 2019 American Community Survey, table DP02 (1-year estimate,

https://data.census.gov/table?q=DP02&tid=ACSDP1Y2019.DP02) "Selected Social Characteristics in the US" (n=16,932,635). This is the baseline population.

2. Use YRBS data from 2019 to determine the **unadjusted** proportion of youth who met the aerobic guideline along with 95% CIs, following YRBS analytic guidelines.

3. Multiply the proportion meeting the aerobic guideline by the total population from #1
   a. This yields the estimated number of students meeting the aerobic guideline at baseline.

Update Years (2021, 2023, 2025, 2027)

The following steps will be used to estimate changes in a given update year relative to youth physical activity in the baseline year of 2019. All comparisons will be between the given update year and 2019.

1. Append the data from the update year to the dataset used above for baseline year calculations. The "year" variable will be the stratification variable for the analyses below.

2. Determine the **unadjusted** proportion who met the aerobic guideline, along with 95% CIs following YRBS analytic guidelines, stratified by year.

3. After estimating the proportions in #2, Use post-estimation linear contrast statements to estimate differences in proportions with Wald tests to determine if the magnitude of any observed difference is statistically different from zero:
   a. Subtract the proportion meeting in 2019 from the proportion meeting in 2021 and note the Wald test p-value
      i. **No Change:** If the p-value is ≥0.05, there was no statistically significant change (change = 0)
      ii. **Increase in meeting aerobic guideline:** If the p-value is <0.05 and the result is positive-signed, there was an increase in meeting the aerobic guideline (desired)
      iii. **Decrease in meeting aerobic guideline:** If the p-value is <0.05 and the result is negative-signed, there was a decrease in meeting the aerobic guideline (not desired)
   b. If there was an increase or decrease in meeting the aerobic guideline, the difference in proportions in 3.a.ii or 3.a.iii will be multiplied by the baseline population and rounded to the nearest whole number.
      i. A positive number represents an increase in meeting the aerobic guideline
      ii. A negative number represents a decrease in meeting the aerobic guideline

Limitations

Adults

Because of the sample design of NHIS, we are missing information on adults who are institutionalized. Further, NHIS relies on self-reported physical activity assessment, which is subject to recall biases, including social desirability bias.

Because NHIS is a repeated cross-sectional survey of different people every year, rather than a panel survey that follows the same people through time, Active People, Healthy Nation must rely on cross-sectional prevalence estimates at each level of activity to estimate leveling up or leveling down. The method we use in these analyses assumes all changes are due to adults moving one level only. In reality, some people may move two levels such as from inactive to active or vice versa. Using repeated cross-sectional prevalence estimates does not allow us to account for the possibility of people moving two levels.

For example, if we observe a decrease in the proportion of adults being inactive, that decrease is assumed to be due to some number of inactive adults becoming insufficiently active, not fully active. In reality, some changes in prevalence may be attributable to shifts between inactive and active. Under the single-level assumption, such shifts would be double counted as a decrease in the number of people inactive and an increase in the number meeting guidelines.

Youth

The youth method also relies on repeated cross-sectional measurement, so is subject to some of the same limitations as the adults. Because there are only two categories, there is no concern about youths moving more than one level. As designed, the youth sample will not collect information on youth not enrolled in high school. As with the adult data, YRBS relies on self-report and is subject to recall biases.

Baseline Estimates - Adults

Indicator/Measure	National Health Interview Survey
	2020
Weighted # of adults in NHIS	252,052,048
Inactive adults	
Crude Percent (95% CI)	26.96% (26.02-27.93)
Count (point estimate)	67,965,406
Insufficiently active adults	
Crude Percent (95% CI)	25.98% (25.29-26.68)
Count (point estimate)	65,478,560
Active adults	
Crude Percent (95% CI)	47.06% (46.18-47.94)
Count (point estimate)	118,608,082

Baseline Estimates – Youth

Indicator/Measure	American Community Survey 2019
# High School Students	16,932,635

Indicator/Measure	Youth Risk Behavior Survey
	2019
Meeting the aerobic guideline	
Crude Percent (95% CI)	44.1% (41.9-46.3)
Count (point estimate)	7,467,292

References

1. Fulton JE, Buchner DM, Carlson SA, Borbely D, Rose KM, O'Connor AE, Gunn JP, Petersen R. CDC's Active People, Healthy NationSM: Creating an Active America, Together. J Phys Act Health. 2018 Jul 1;15(7):469-473. doi: 10.1123/jpah.2018-0249.

2. National Center for Health Statistics. National Health Interview Survey. https://www.cdc.gov/nchs/nhis/index.htm. Accessed 28 November 2022.

3. United States Department of Health and Human Services. Physical Activity Guidelines for Americans, second edition. https://health.gov/sites/default/files/2019-09/Physical_Activity_Guidelines_2nd_edition.pdf. Accessed 28 March 2023.

4. Centers for Disease Control and Prevention. Youth Risk Behavior Surveillance System. https://www.cdc.gov/healthyyouth/data/yrbs/index.htm. Accessed 28 November 2022.