

The Healthy Behavior Data Challenge

Phase 1 Submission Template

Introduction

The Healthy Behavior Data Challenge responds to the call for new ways to address the challenges and limitations of self-reported health surveillance information and tap into the potential of innovative data sources and alternative methodologies for public health surveillance.

The Healthy Behavior Data Challenge will support the development and implementation of prototypes to use these novel methodologies and data sources (e.g., wearable devices, mobile applications, and/or social media) to enhance traditional healthy behaviors surveillance systems in the areas of nutrition, physical activity, sedentary behaviors, and/or sleep among the US adult population aged 18 years and older.

The collection of health data through traditional surveillance modes including telephone and in-person interviewing is becoming increasingly challenging and costly with declines in participation and changes in personal communications. In addition, the self-reported nature of responses particularly in the areas of nutrition, physical activity, sedentary behaviors, and sleep has been a major limitation in these surveillance systems, since self-reported data are subject to under/over reporting and recall bias. Meanwhile, the advent of new technologies and data sources including wearable devices (Fitbit, Garmin, Adidas, Jawbone, smart watches, activity trackers, etc.), mobile health applications on smartphones or tablets, and data from social media represents an opportunity to enhance the ability to monitor health-related information and potentially adjust for methodological limitations in traditional self-reported data.

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The Healthy Behavior Data Challenge will harness this potential and identify feasible alternative options for collecting health-related behaviors in new ways. Conducted in two phases, Phase I (Prototype Development) entails Challenge participants developing a concept proposal for obtaining data collected from wearable devices, mobile applications and/or social media for public health surveillance purposes.

The Healthy Behavior Data Challenge participants will propose data sources and approaches for aggregating data from wearable devices, mobile applications and/or social media in the areas of nutrition, physical activity, sedentary behaviors, and/or sleep. In Phase II (Prototype Implementation), a subset of submissions (up to 3) with promising concepts will be invited to test their proposed approaches for ongoing public health surveillance.

Website:

Additional Information:

Information on the Behavioral Risk Factor Surveillance System can be found at www.cdc.gov/brfss.

Details on the HBD Challenge may be found at challenge.gov.

For Further Information Contact: Dr. Machell Town at BRFSSinnovations@cdc.gov.

Submission Deadline:

1) Challenge Team Information

Team Name

Team Lead

City/Province

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E-mail

Phone Number

Subject-matter/domain expertise

Team Member #1

E-mail

Subject-matter/domain expertise

Team Member #2

E-mail

Subject-matter/domain expertise

Team Member #3

E-mail

Subject-matter/domain expertise

Team Member #4

E-mail

Subject-matter/domain expertise

Team Member #5

E-mail

Subject-matter/domain expertise

Team Member #6

E-mail

Subject-matter/domain expertise

Are all team members residents of the United States?

2) Organization (if submitting on behalf or as part of an organization)

Organization Name

Website

Type of Organization

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3) How did you find out about this challenge?

4) Submission Overview

Project Title

Project Overview

Describe in **500** words or less:

- What aspects of sleep, physical activity, nutrition, and sedentary behavior do you propose to report on and why are they important for public health surveillance?
- Provide a brief description of the source(s) of data that will be used to report on these aspects, how your team proposes to access them, and why they are appropriate for use in public health surveillance?
- How do you see your concept improving on current public health surveillance in the areas of sleep, physical activity, nutrition, and sedentary behaviors?

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5) Indicators to be measured (the indicators listed below are not comprehensive and innovators are recommended to include other relevant indicators)

A) Physical Activity

- Amount of MVPA¹ time per day
- Amount of MVPA time per day obtained in bouts of 10 minutes or more
- Amount of MVPA time accrued while at work, at home and/or in transit
- Identification of times during the day where MVPA is high
- Daily number of steps
- Miles/km (Distance) on foot or other modes of active transportation
- Frequency of MVPA
- Calories burned
- Type of activity (aerobic, strength, etc.)
- Level of activity (low, moderate, high)
- Time spent in different domains of MVPA (home/occupational, travel and recreational)
- Location of MVPA (recreation facility, at home, at work, on sidewalk/bike lane)
- Perception of safety while active
- Enjoyment level of the MVPA
- Number/flights of stairs climbed
- Average and peak heart rate
- Hours per week adults spent in sports, fitness or recreational physical activities
- Other indicators

B) Sedentary Behavior²

- Amount of time per day spent sedentary, excluding sleep time
- Amount of time per week spent on a computer/screen including watching TV, videos, playing computer games, emailing or using the internet
- Amount of sedentary time accrued while at work, at home and/or in transit
- Sitting time at work/ number and frequency of breaks at work from sedentary time
- # of hours spent in a car or motor-vehicle
- Other indicators

C) Sleep

- Hours of sleep per night (sleep duration)
- Amount of time awake after sleep onset
- Sleep efficiency
- Amount of time to fall asleep (i.e., sleep latency)

¹ Moderate-to-vigorous physical activity (MVPA) is any activity with an energy expenditure >3 metabolic equivalents

² Sedentary behavior is any waking activity characterized by an energy expenditure ≤ 1.5 metabolic equivalents and a sitting or reclining posture

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- Consistency of bedtime
- Consistency of wake time
- Amount of time in REM vs. non-REM sleep (duration of sleep stage)
- Type of activity directly before sleep (e.g., screen time, reading, TV)
- Sleep satisfaction in morning
- Daytime sleepiness
- Other indicators

D) Nutrition

- Total calories consumed per day
- Total calories from fat
- How often fruit (not including juices) was consumed (day, week, or month)
- How many times per day/week/month a green leafy or lettuce salad, with or without other vegetables, was eaten
- How often vegetables (not including lettuce salads and potatoes) was eaten (day, week, or month)
- Number of sugar-sweetened beverages consumed in a week (or per day)
- Number of caffeinated drinks consumed in a week (or per day)

6) Summary of proposed data source(s) (complete applicable sections)

Data Source		Data Accessibility (e.g., API, specialized software, existing data set)	Data Cost (i.e., fee for access, open access)	Data Recency and Update Frequency (i.e., how recent is the data and how often is it collected)	Applicable Functional Area(s) and Indicator (i.e., physical activity, nutrition, sleep, and/or sedentary behavior)	Existing Users of the Data Source (i.e., identify examples of organizations or other groups that have or are using the data source)
Organization (e.g., company)	Method of Collection (e.g., wearable, self-reported)					
1						
2						
3						
4						
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10						

- 7) Describe how the data that you will use provides information and insight that is complementary to or more novel and innovative than that currently utilized for public health surveillance by CDC? (Novelty/innovation can apply at the level of the individual data source(s) selected, the specific indicators to be measured, tools/solutions that are used to capture the data, or result from newly created linked data sets). (750-word limit)
- 8) Describe the process you will use to link the data from the different sources you've identified. Include a description of feasibility and any considerations that will be made to ensure the privacy, security and confidentiality of the data and data subjects throughout this process. (750-word limit)
- 9) Describe how the linked data set(s) or individual data source(s) will be used to develop values for your proposed set of metrics in sleep, sedentary behaviors, nutrition, and/or physical activity. (500-word limit)
- 10) Describe the representativeness of your data set for public health surveillance (e.g., to what population groups or sub-groups can you meaningfully extrapolate the results of your data set?). How amenable will this data set be to disaggregation by age, gender, education, geography, or other demographic characteristics? (750-word limit)
- 11) How useful will your data set be for public health surveillance, how significant/relevant and generalizable are the results that you expect to obtain? (500-word limit)
- 12) Will the proposed project's data and data sets contain information of relevance to other areas of public health surveillance (e.g., chronic or infectious disease)? If yes, please specify and describe any additional work that would be required in order to expand applicability. (500-word limit)

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13) Please describe a 3.5-month plan to develop a working prototype during the second phase of this challenge. This should include:

- 1) Details on how you will gain access to and link data from the source(s) you've identified.
- 2) Approaches/strategies that will be taken to ensure privacy/confidentiality of data before and after linkage.
- 3) Your approach to comparing results from your prototype to that generated from existing public health surveillance programs
- 4) A description of the format your prototype will take (e.g., visualization, online data tool, etc.)
- 5) Costs you expect to incur during this prototyping phase

(1500-word limit)

14) Significance and Relevance Summary

In 200 words or less, provide a brief summary of your project using language that is easily understood by the general public. Note: this description will be shared with a broad audience and should not include any information you would not want shared widely.

Public reporting burden of this collection of information is estimated to average 60 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to CDC/ATSDR Reports Clearance Officer; 1600 Clifton Road NE, MS D-74, Atlanta, Georgia 30333; ATTN: PRA (0990-0390).