



Closing the Loop: Augmenting Mobile Data Sources for Public Health Surveillance

August 4, 2017

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AGENDA

- 1 Purpose**
- 2 Summary of Data Sources**
- 3 Methods**
- 4 Anticipated Outcomes**

PURPOSE

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Onlife Health has designed a solution to simplify and improve the quality and quantity of health behavior data collection by aggregating personal wearable device and mobile health app data, augmented with mobile location data and just-in-time survey questions. **Our solution will improve on current public health surveillance in four ways:**

1.

Improves costs by:

- Reducing the human resource burden of administering the surveys

2.

Improves recall bias by:

- Leveraging wearable devices and mobile phone apps for objective data collection
- Administering just-in-time surveys to validate and provide context to device data and to collect additional data not tracked by wearable devices and mobile applications

3.

Improves under/over reporting by:

- Leveraging wearable devices and mobile phone apps for objective data collection

4.

Improves response rate by reducing the respondent burden by:

- Making the questions more friendly
- Creating engaging and easy methods of completing the survey

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SUMMARY OF DATA SOURCES

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SUMMARY OF DATA SOURCES

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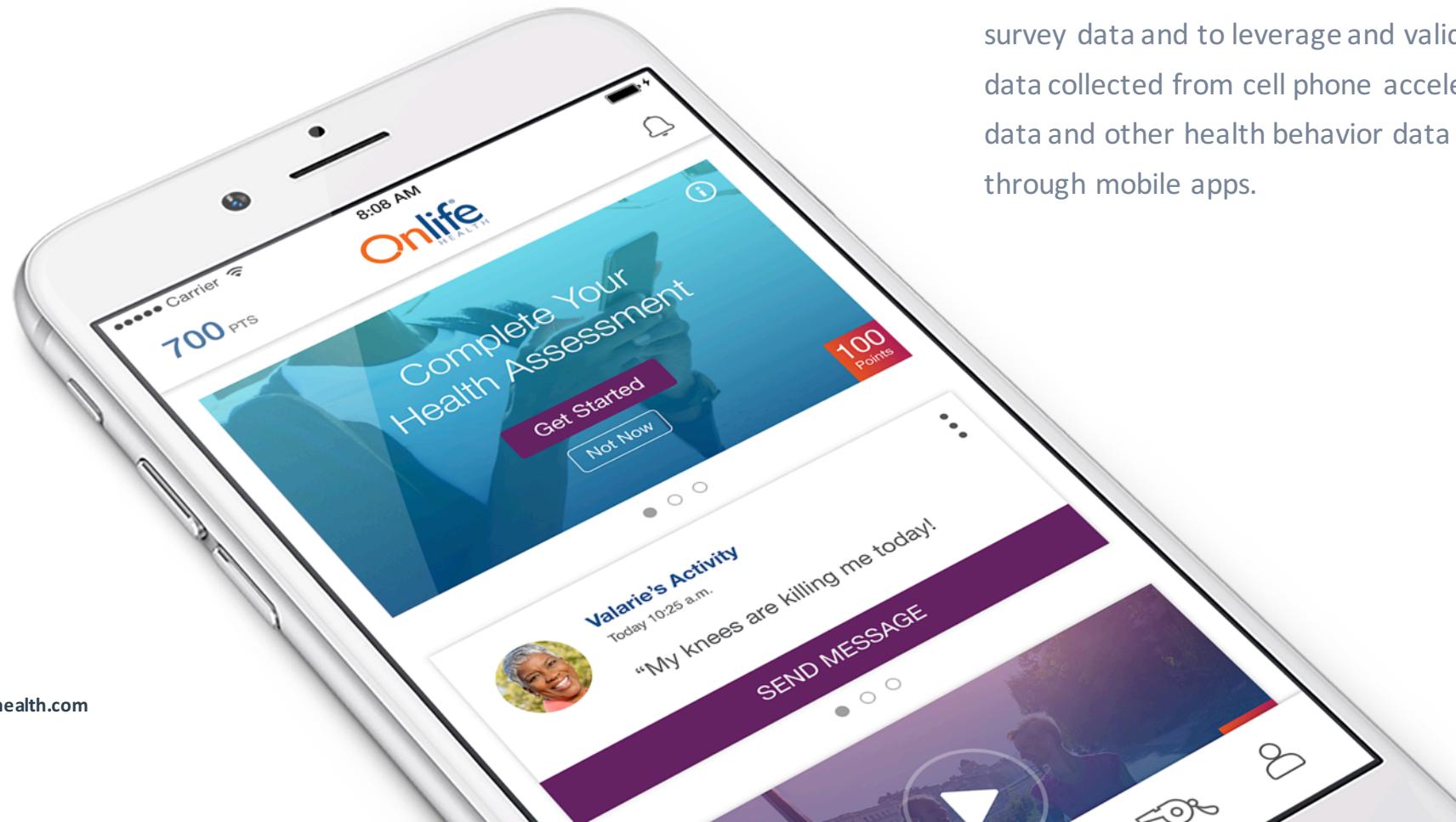
Data Source					
Organization (e.g., company)	Method of Collection (e.g., wearable, self-reported)	Data Cost (i.e., fee for access, open access)	Data Recency and Update Frequency (i.e., how recent is the data and how often is it collected)	Applicable Functional Area(s) and Indicator (i.e., physical activity, 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)
Onlife Health/Validic	API	Validic has fee for access which Onlife Health already subscribes to (or partnership)	Descriptive, Predictive and Prescriptive	Physical activity and sedentary behavior	Onlife Health, as well as, companies across the world. Validic aggregates data from more than 400 devices and has reached over 223M individuals
Onlife Health	API	Open access APIs available for Android	Close to real time/collected multiple times a day		
Onlife Health © Onlife Health onlifehealth.com	Specialized Mobile Application developed by Onlife	Structured	Close to real time /collected multiple times a day		



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ALWAYSON® MOBILE APP

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Onlife Health will build a mobile app to collect survey data and to leverage and validate device data collected from cell phone accelerometer, GPS data and other health behavior data tracked through mobile apps.

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METHODS

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METHODS

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Physical Activity

- Amount of MVPA time per day
- Amount of MVPA time accrued while at work, at home and/or in transit
- Identification of time during the day where MVPA is high
- Frequency of MVPA
- Location of MVPA (recreation facility, at home, at work, on sidewalk/bike lane)
- Perception of safety while active
- Enjoyment level of MVPA
- Readiness to change physical activity behaviors

Sedentary Behavior

- Amount of time per day spent sedentary, excluding sleep time
- Amount of sedentary time accrued while at work, at home and/or in transit
- Number of hours spent in a car or motor-vehicle
- Readiness to change sedentary behaviors

Sleep

- Hours of sleep per night (sleep duration)
- Amount of time awake after sleep onset
- Consistency of bedtime
- Consistency of wake time
- Type of activity directly before sleeping (e.g., screen time)
- Sleep satisfaction in the morning
- Daytime sleepiness
- Readiness to change sleep behaviors

Nutrition

- How often fruit to change (not including lettuce salads and potatoes) was eaten (day, week, or month)
- Number of sugar-sweetened beverages consumed in a week (or per day)

Data sources leveraged will include mobile phone sensor data (e.g., GPS, accelerometer), data from wearable fitness devices, and responses to cell phone administrated survey questions.

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METHODS: VALIDATION GRIDS

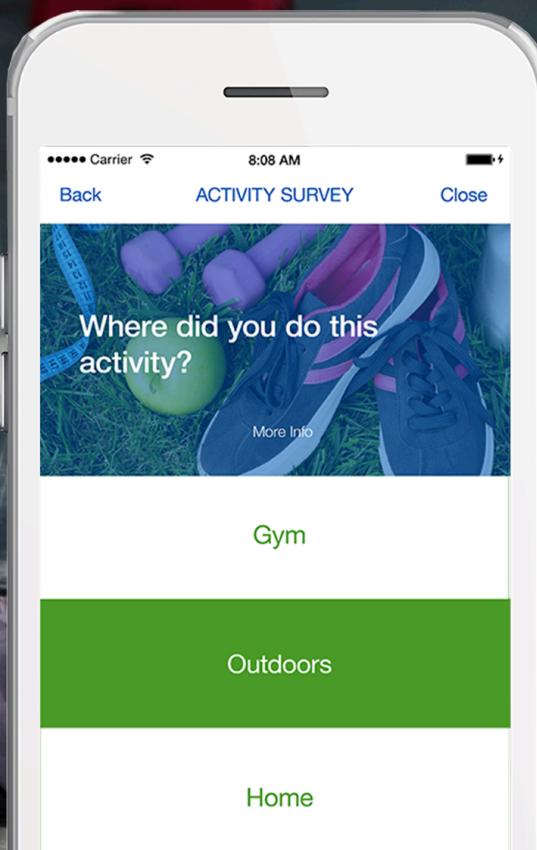
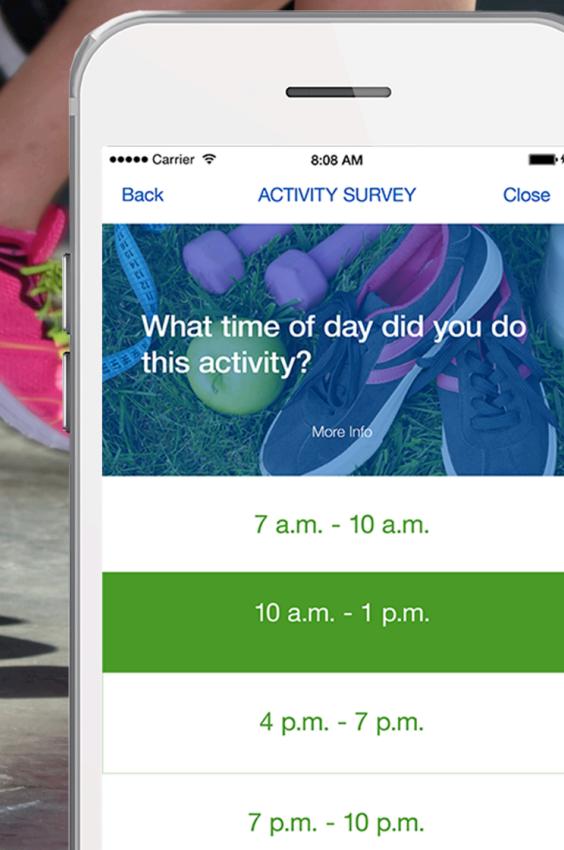
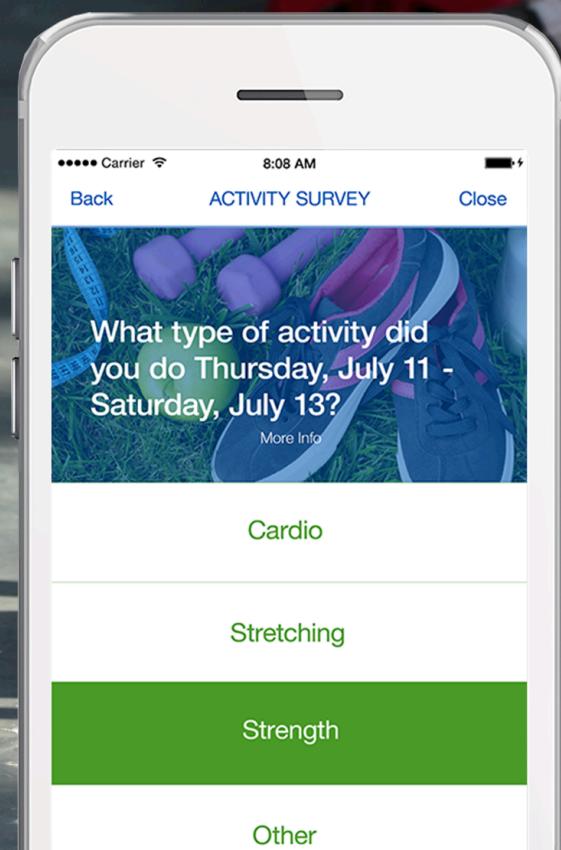
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Onlife will use validation grids to substantiate the various health behavior data collected from devices and mobile apps.

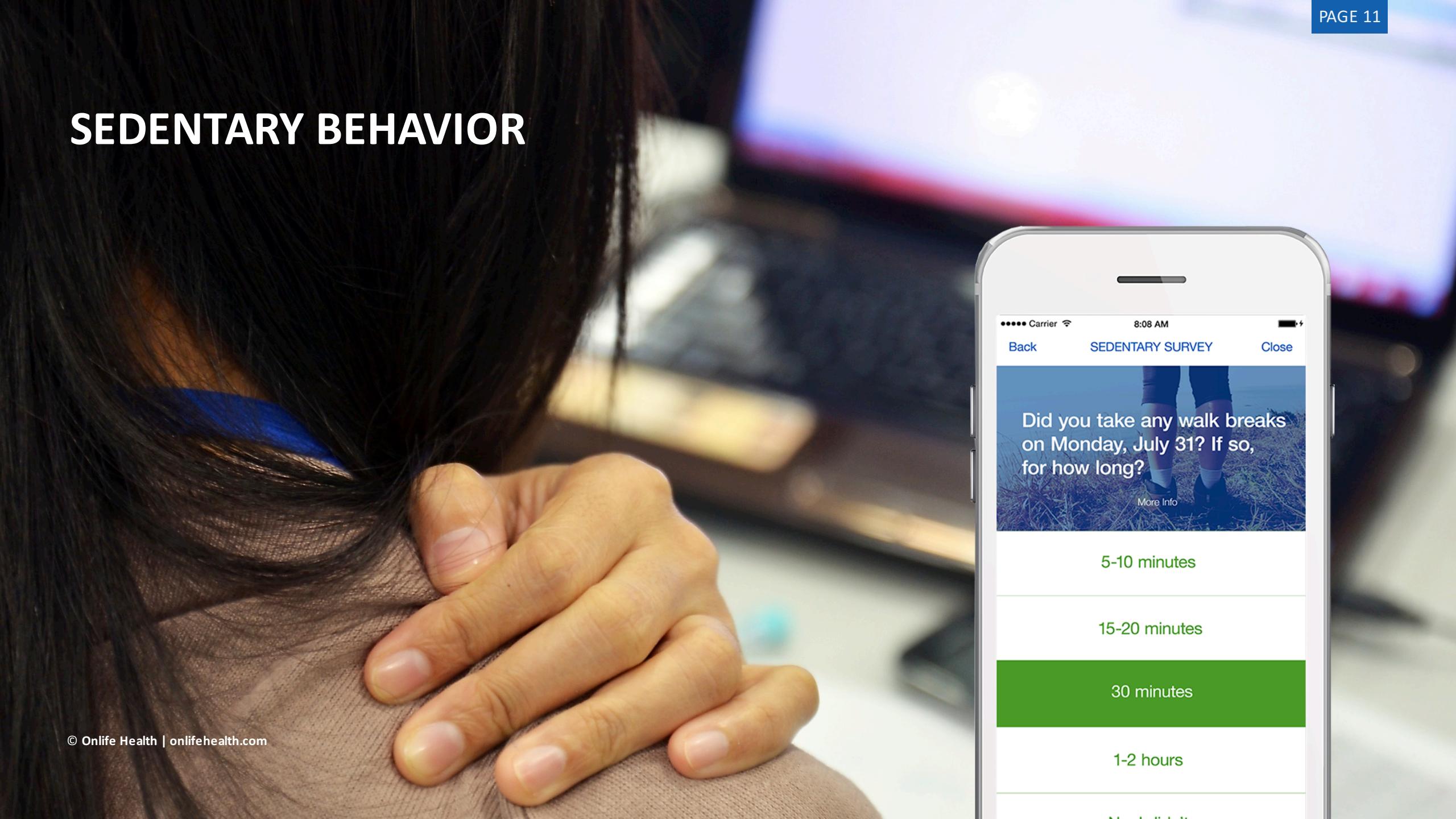
Here's how the validation grids will work.

- The validation grids will be pre-populated with wearable device, mobile app and geolocation data and pushed to participants every 1-7 days for user verification.
- Multiple features will enable the ease of data collection and lower barriers to completion, such as, one-touch responses, auto-complete from previous similar entries and simple add/delete functions to modify rows.
- In addition to the validation grids, Onlife will use push notifications to nudge participants to answer survey questions that are comparable to those collected through the BRFSS.

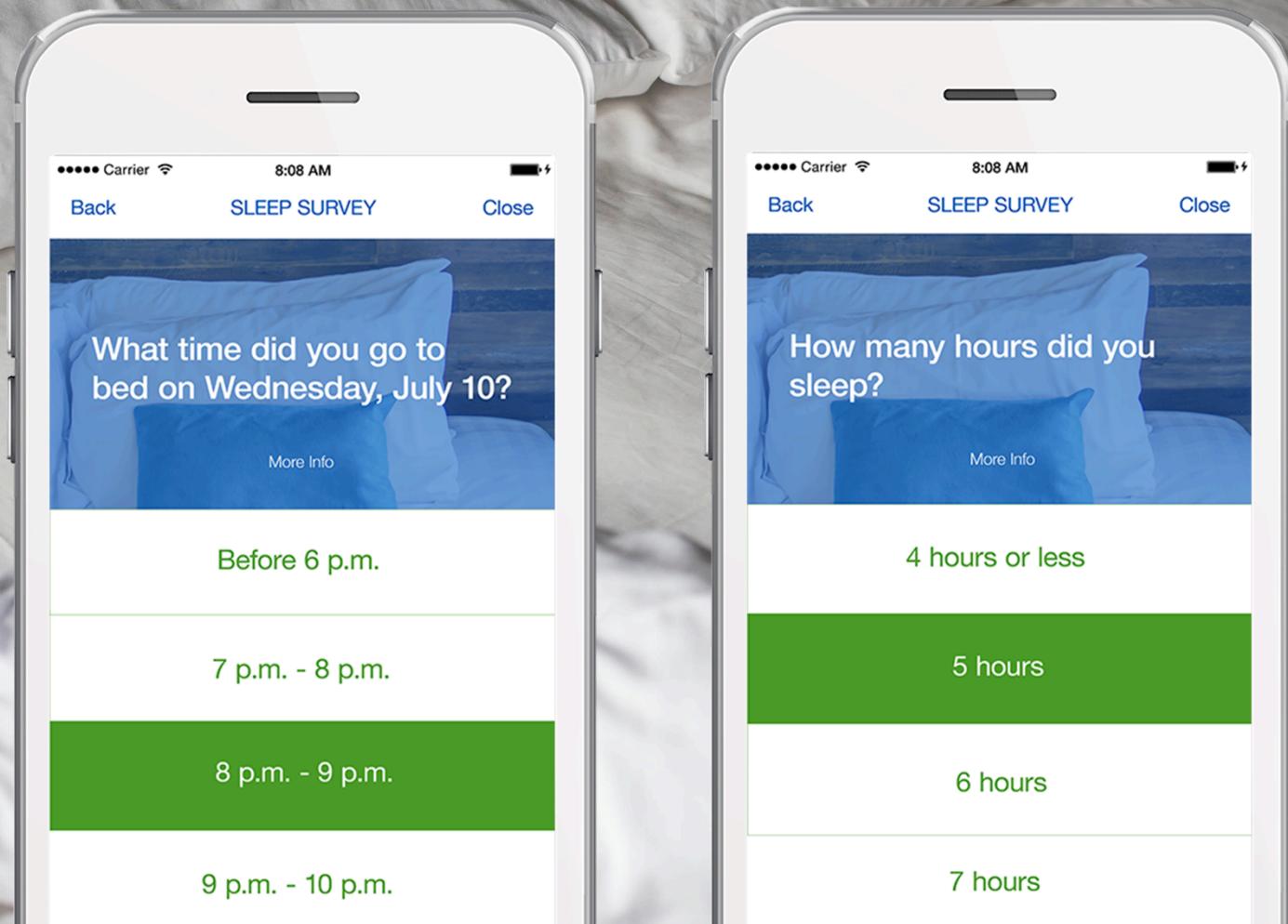
PHYSICAL ACTIVITY



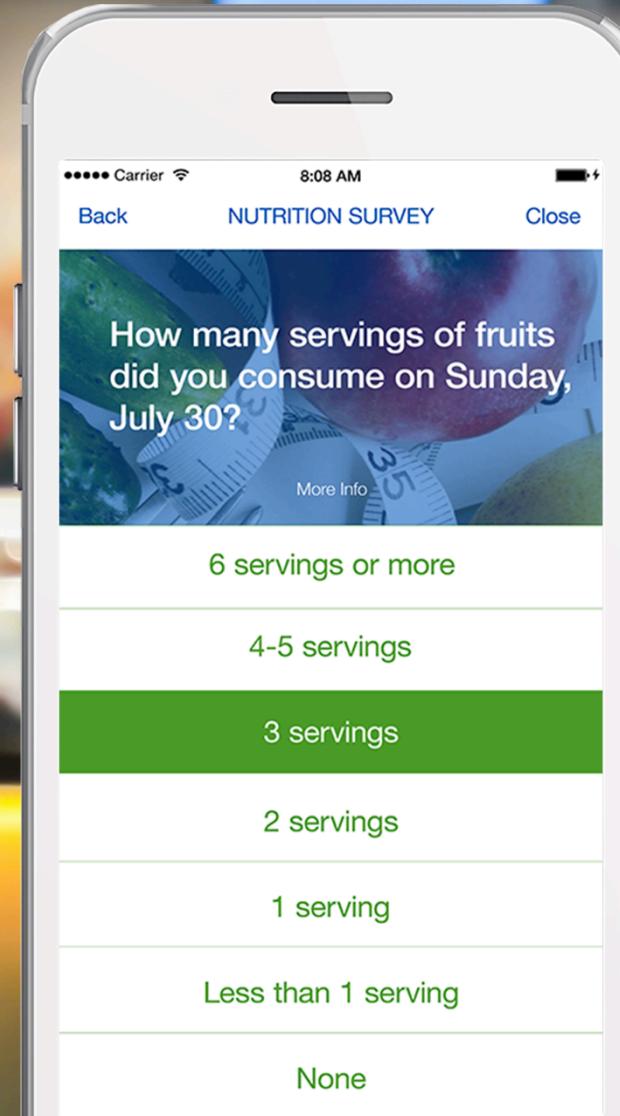
SEDENTARY BEHAVIOR



SLEEP



NUTRITION



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METHODS: DATA SECURITY

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Onlife is HIPAA compliant. We currently hold two URAC designations and one NCQA accreditation, both requiring HIPAA compliant policies for all PHI or potential PHI data. Additionally, we are a Health Information Trust Alliance (HITRUST) CSF Certified organization. Holding this certification shows Onlife has a framework in place that has the needed structure, detail and clarity in relation to information security tailored to the healthcare industry.

The most secure data transmission and encryption standards are used to ensure the integrity of all data entrusted to Onlife. Internal security scans are conducted semi-annually along with an external audit every eighteen to twenty-four months by a third party with expertise in that area.



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OUTCOMES



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ANTICIPATED OUTCOMES

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Onlife's methodology for survey collection will result in:

- A validated survey result data set
- Improved response rate
- Improved quality of the data by leveraging current technologies

The data collected will be suitable for:

- Analysis and identification of trends in health behaviors
- Comparison to a wide cross section of BRFSS results
- Identifying generalizable results on the disparity between wearable health device measurements and true health behaviors that may allow for studies to be done more accurately on a larger scale

Other benefits of the proposed framework are:

- It is easily extensible to other surveys and health behavior and risk factor topics
- Administering surveys in such manner may result in some measure of behavior change through the use of just-in-time surveys and tracking of health behaviors

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THANK YOU

