IEEE STANDARDS ASSOCIATION

IEEE

P1752 Working Group

Sponsored by IEEE Engineering in Medicine & Biology (EMB) Standards Committee

30 January 2020

Presentation to EMBS

Ida Sim (Chair), Simona Carini (Secretary), UCSF

Problem Statement

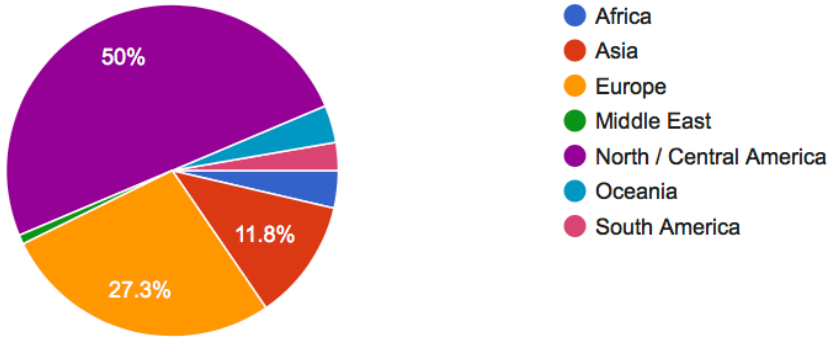
- mHealth data encompasses personal health data collected from sensors and mobile applications
- Mobile health data and metadata standards are needed
  - Each device maker / app developer decides how to represent data and metadata
  - Data are poorly specified
- Standardizing mHealth data and metadata will
  - Make data aggregation across multiple sources easier and more accurate
  - Reduce costs of using mHealth data to make biomedical discoveries, improve health, manage disease

P1752 Open Mobile Data Working Group

- **Purpose:** The purpose is to provide standard semantics to enable meaningful description, exchange, sharing, and use of mobile health data. Data and associated metadata will be sufficiently clear and complete to support analysis for a set of consumer health, biomedical research, and clinical care needs.
- **Main work:** The main work of this group will be to 1) validate the existing Open mHealth schemas through review and use by WG members; 2) define priority areas for additional schema development; 3) prepare the draft standard for balloting; and 4) promote and support ongoing community use, contribution, and refinement of Open mHealth schemas and tools.
- **Related Standards:**
  - IEEE 11073
  - HL7 FHIR

P1752 Open Mobile Data Working Group

- Chair: Dr. Ida Sim, UCSF
- Secretary: Simona Carini, UCSF
- Main WG kick-off meeting: February 5, 2018
  - https://site.ieee.org/sagroups-1752/meeting-agenda-minutes/
- Listserv currently has 229 subscribers
- 20-30 participants at each WG call



Survey of initial membership, 2018

Open mHealth
501c3

NIH Grant for Standards Development

MD2K
Center of Excellence for Mobile Sensor Data-to-Knowledge

NIH BD2K Center

IEEE P1752
started

IEEE P1752
OS site & ballot

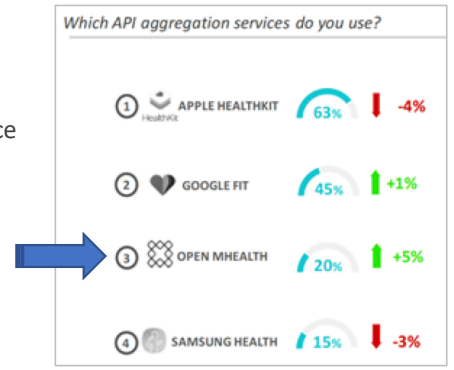
2011 2012 2013 2014 2015 2016 2017 2018 2019 2020

Support provided by
Robert Wood Johnson Foundation

TIDES
WHAT'S POSSIBLE

California Health Care Foundation

mProv
NSF Grant on Provenance



Research2Guidance, 2018

From Open mHealth to P1752

Open mHealth approach to data sharing

- first create a common language
  - **schemas to structure data and metadata ← focus of P1752**
  - an API to exchange it
- then provide free and open-source tools to
  - validate data
  - pull in data from large and popular device manufacturers
  - store data and share it with securely with others
  - move data in and out of EHRs
  - process and visualize data

Metadata Landscape

Open mHealth

data and metadata standards

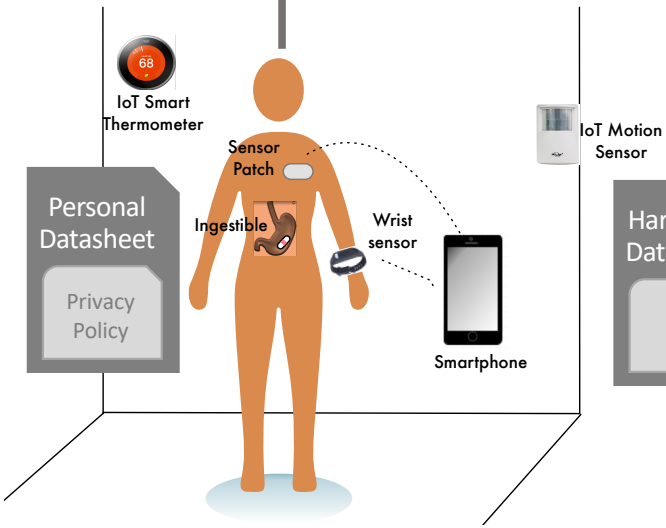
Software Datasheet

Dataset & ML Details

Data stream(s) → Firmware/ algorithm →

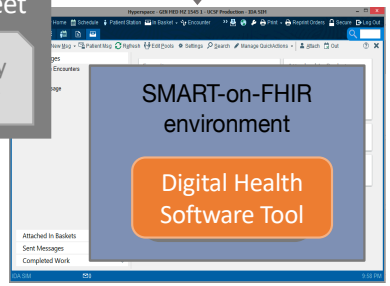
```
{
  Header/min metadata
}
{
  Body: datapoint
}
```

Cloud or Edge: Runtime acquisition and privacy metadata



Product Datasheet

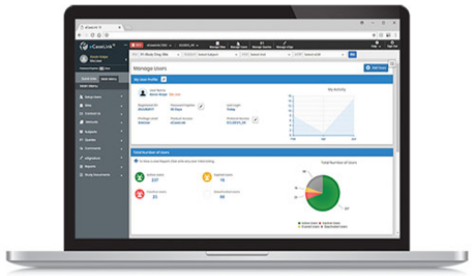
Privacy Policy



Electronic Health Record

Study Protocol

Data Sharing Policy



Clinical Trial Management System

P1752 Open Mobile Data Working Group

Three subgroups

Topics chosen by WG voting + availability of subgroup chairs

1. **Physical activity / mobility**, led by Shiv Hiremath, Temple University, tasked to model data pertaining to physical activity and mobility measures
2. **Sleep**, led by Charlotte Chen, Philips, tasked to model data pertaining to sleep macrostructure (e.g., sleep duration, sleep stages), sleep microstructure (e.g., arousals), and other sleep-related phenomena (e.g., apnea)
3. **Minimum metadata**, led by Ida Sim, UCSF, tasked to model the minimum metadata to be carried with each mobile health datapoint

P1752 as IEEE Open Source Project

Standard document includes justification and modeling principles

Standard schemas published on the OS site (under development)

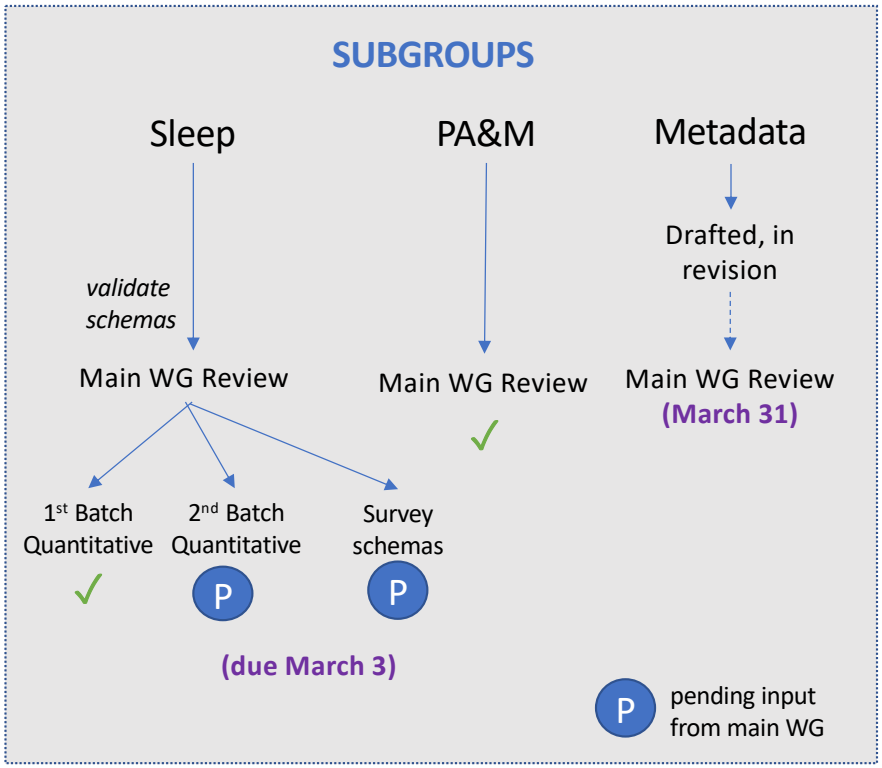
1. **Physical activity / mobility:** 1 schema
2. **Sleep:** 15 schemas
3. **Minimum metadata** 2 schemas
4. **Utility** schemas (units of measure, time measures, value sets): 15 schemas
5. **Generic survey** schemas (to be used to create specific surveys): 8 schemas
6. Sample data (example instances) for all the schemas

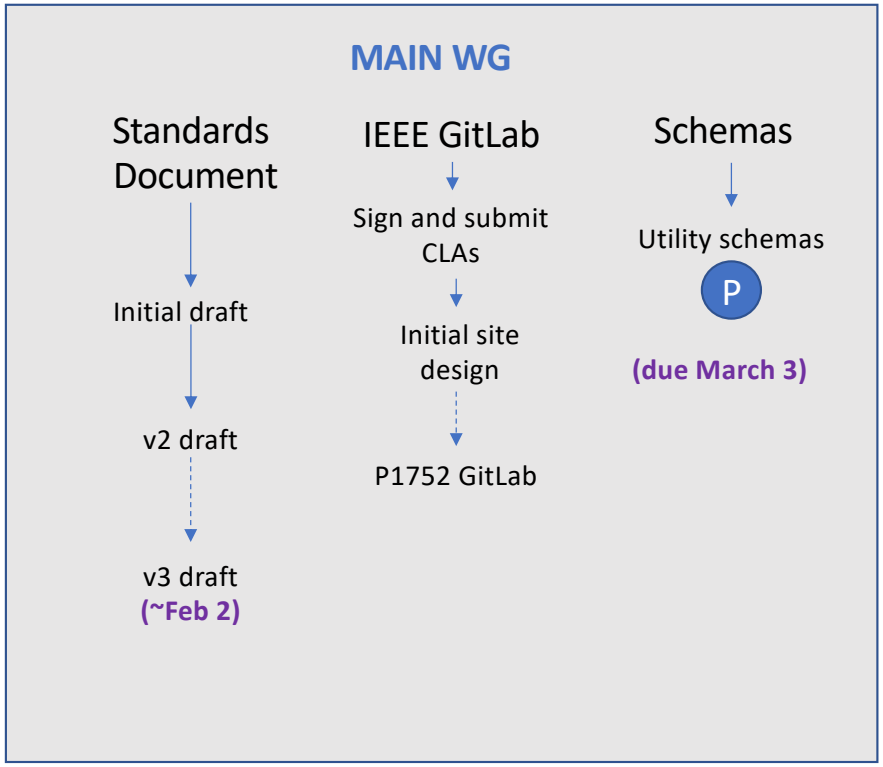
Documentation for the repository [in progress]

Test data and other tools to perform continuous validation [not yet started]

Progress Towards Balloting

P1752 Workstreams





Thank You