**Problem**

- Health data are multi-layered: An individual’s health is affected by many factors across different layers.
- Successful interventions require reasoning across layers.
- Goal: Create platform for generating a 360-degree view of an individual’s health by integrating all relevant data. Allow efficient analytics on these data.

**Predictive Analytics for Spatiotemporal Sensor Data**

- Health data are often spatiotemporal
  - Air quality data, wearable fitness tracking data, traffic data, cardiograms, etc.

**Existing DBMSs are not suitable for spatiotemporal health data**

Spatiotemporal data are measurements taken at different points in time & space and therefore they cannot be directly integrated and correlated.

- e.g., Compute average quality of air breathed during a walk

**Learn from spatiotemporal health data by operating on the underlying models**

Instead of using the measurements, infer the corresponding model & use it for predictive analytics.

- e.g., Compute average quality of air breathed during a walk

**System Architecture**

- Source/Application libraries for Android & Web Applications
  - Allows both native smartphone applications and web applications to act as both data consumers and data providers/sources.
- HIPAA-compliant Backend
  - Protects data behind firewall, filtering them before exposing them to the applications. Satisfies HIPAA requirements.

**Proof of Concept**

- San Diego County as a test-bed
  - Use DELPHI to build a 360-degree view of health in San Diego by integrating health data from different local companies & agencies.

**Data Acquisition**

Acquire data of health-related factors and build corresponding wrappers.

**Application Development**

Develop applications that retrieve integrated health data from DELPHI, showcasing the need for a 360-degree view of an individual’s health.

**Asthma Patient App**: Combines asthma info with air quality data from mobile sensors and the San Diego Air Pollution Control District.

**DELPHI-leveraged Efforts**

**Center for Medicare & Medicaid Innovation Grant**

DELPHI will serve as the core architecture for a “Care Technology Innovation Platform” to address cardiovascular disease and stroke.

**Robert Wood Johnson Foundation Grant**

DELPHI is being proposed as the core data integration platform for a county-wide exploration of health indicators.

**Partnerships**

- Qualcomm Life
- HHS
- SUGANDA
- Connect
- UC San Diego
- Centers for Medicare & Medicaid Services
- et al.