



OPTUM STRATETHON

SEASON 2

CASE STUDY (E-SCHOOLS)



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In the US healthcare system, patients often must deal with issues of approachability, availability and affordability when it comes to receiving care at hospitals. In some cases, the patients are required to travel long distances multiple times in a month for treatments and tests. Often these travels get difficult to plan and manage, as, about 28 percent of older adults in the United States live alone. In some other cases patients avoid hospitals and miss getting proper care due to the cost. A 2018 report says 64% Americans have avoided or delayed medical care in the last year due to expected costs. Even when a patient can receive care, things can go wrong as it is becoming more and more difficult for hospitals to provide proper care owing to physician burnouts and shortage of nurses. As per Medscape National Physician and Suicide report 2020, 42% physicians in the US reported that they are burned out. Additionally, according to the "United States Registered Nurse Workforce Report Card and Shortage Forecast", a shortage of registered nurses is projected to spread across the country. On the other side a rise in the number of patients suffering from chronic diseases (6 in 10 adults in the US) makes it even more important, for the patients, to receive constant and continuous care.

A report suggests that 46% of hospital care can be moved to a patient's home, especially continuous measurements, tests, and monitoring of vital stats. Advancements in Ambient technology, combining the power of IoT and AI has made it possible to turn our homes into hospitals of the future, where the digital environment is sensitive, adaptive and responsive to the conditions, habits, gestures, emotions and needs of patients which are measured, analyzed and acted upon.

- For people with chronic diseases, this technology can be used to continuously monitor health and behavioural features such as heartbeat, body-temperature, physical activity, blood pressure, ECG, EEG, EMG etc., through sensors on clothing, wearables or any household items which the patient interacts with.
- By using AI to recognize activities and behaviours of patients alongside knowledge-based decision support system, it might be possible to provide assistive care for individuals with physical or mental limitations, through voice assisted devices and other smart devices.

Availing proper care from hospitals can be costly and not always feasible. A robust tech driven care at home system can help in reducing the cost of care as well as solve the issue of approachability to a large extent.

Here are few Example use cases one can follow:

1. Citizen care

Prevent the onset of serious health conditions through

- Diet and nutrition management
- Stress and emotion management/therapy
- Fitness apps and programs
- Integrated health engagement incentives
- Cognitive and brain health.

1. Senior citizen care - Aging at home

Use Technology to enable older adults to continue living in their homes safely and affordably such as

- Home sensor activity tracking
- Hearing and vision health
- Mobility assistance
- Meal plan
- Delivery and cooking solutions
- Social communities

Solution

Come up with a solution which identifies/implements/recommends clinical or non-clinical (e.g. life-style, preventive care) to bring the cost of care down. This creative solution may include applications, portals, dashboards, UI/UX experience and it can be powered by modules, AI models, algorithms or any other artefacts.

This work solution should be deployed, presented and code needs to be shared over the GitHub.

Data to be utilized for building and demonstrating the use case

For the data, you are going to make use of synthetic patient data in CSV (comma separate values) format available in public domain. For your convenience, we have attached the data which need to be used for working on the use case.



[synthea_sample_data_csv_apr2020.zip](#)

Following table has detail about each of the csv files one can get when they extract the data.

File	Description
allergies.csv	Patient allergy data
careplans.csv	Patient care plan data, including goals.
conditions.csv	Patient conditions or diagnoses.
devices.csv	Patient-affixed permanent and semi-permanent devices.
encounters.csv	Patient encounter data.
imaging_studies.csv	Patient imaging metadata.

File	Description
immunizations.csv	Patient immunization data.
medications.csv	Patient medication data.
observations.csv	Patient observations including vital signs and lab reports.
organizations.csv	Provider organizations including hospitals.
patients.csv	Patient demographic data.
payer_transitions.csv	Payer Transition data (i.e. changes in health insurance).
payers.csv	Payer organization data.
procedures.csv	Patient procedure data including surgeries.
providers.csv	Clinicians that provide patient care.
supplies.csv	Supplies used in the provision of care.

The detailed data dictionary for the above is available in the following location :
<https://github.com/synthetichealth/synthea/wiki/CSV-File-Data-Dictionary>