FHIR Buffer Overflow

Utilizing FHIR Bulk Data API For Real-Time Public Health Needs Assessments

CS6440 Fall 2018 Deliverable 4

Link to Youtube Video
https://youtu.be/UsWlc61KqsA

Mentor:
Dr. John Bender

Team Members:
(narrator) Simon Lee
(narrator) Cody Hutchens
Pauline Sho
Van Mang
Varun Be
Vijay Pothana

Gantt Chart

FHIR BUFFER OVERFLOW

PROJECT TITLE	FHIR for Public Health Needs Assessment				**COMPANY NAME**	Georgia Institute of Technology
PROJECT MANAGER	Varun Behl				**DATE**	10/21/18

	Task	Owner	Start	End	Days	% Complete
1	**Deliverable 1**			**10/7/18**		
1.1	Gantt Chart	Varun	10/3/18	10/7/18	4	100%
1.2	Powerpoint	Pauline	10/3/18	10/7/18	4	100%
1.2.1	Narration	Van	10/3/18	10/7/18	4	100%
1.3	Research	Vijay/Cody	10/3/18	10/7/18	4	100%
1.4	Business Case	Simon	10/3/18	10/7/18	4	100%
1.5	Project Status Report	Varun/Pauline	10/3/18	10/7/18	4	100%
2	**Deliverable 2**			**10/21/18**		
2.1	Architectural Diagram	Simon/Cody	10/8/18	10/21/18	6	100%
2.2	Screen Prototype	Vijay/Van	10/8/18	10/21/18	6	100%
2.3	Powerpoint	Varun/Pauline	10/8/18	10/21/18	6	100%
2.3.1	Narration	Varun/Pauline	10/8/18	10/21/18	6	100%
2.4	Update Gantt Chart	Varun	10/8/18	10/21/18	6	100%
3	**Deliverable 3**			**11/11/18**		
3.1	Deployment Plans	Pauline/Vijay/Van	10/22/18	11/11/18	20	100%
3.2	Update Gantt Chart / Detailed update	Varun	10/22/18	11/11/18	20	100%
3.3	Powerpoint	Pauline/Vijay/Van	10/22/18	11/11/18	20	100%
3.3.1	Narration	Vijay	10/22/18	11/11/18	20	100%
3.3.2	Demonstration	Cody/Simon/Varun	10/22/18	11/11/18	20	100%
3.4	Partially Functioning Application	Cody/Simon	10/22/18	11/11/18	20	100%
4	**Deliverable 4 + 5**			**12/2/18**		
4.1	Finish Project	All Team Members	11/12/18	12/2/18	20	100%
4.2	Unit Testing	Simon/Cody	11/12/18	12/2/18	20	100%
4.3	Final Presentation	All Team Members	11/12/18	12/2/18	20	100%
4.3.1	Narration	Simon/Cody	11/12/18	12/2/18	20	100%
4.3.2	Powerpoint	Simon/Cody/Varun	11/12/18	12/2/18	20	100%
4.4	Final Presentation	All Team Members	11/12/18	12/2/18	20	100%

Innovation

- Synthea, containerization of FHIR servers
- OAUTH2 and API authentication
- Bulk data api - brand new
- NdJson
- Parsing FHIR from NdJson using available tools
- Decoupled architecture

Research

- Community Health Assessments
- What metrics are of interest to policy makers
- What are the current bottlenecks for developing health assessments
- Calculation of Child Obesity using Growth chart
  - BMI and child age is used to define percentile
- Mapping Patient address to Census Blockgroups
- JWKS authentication/authorization
- Hapi FHIR resources

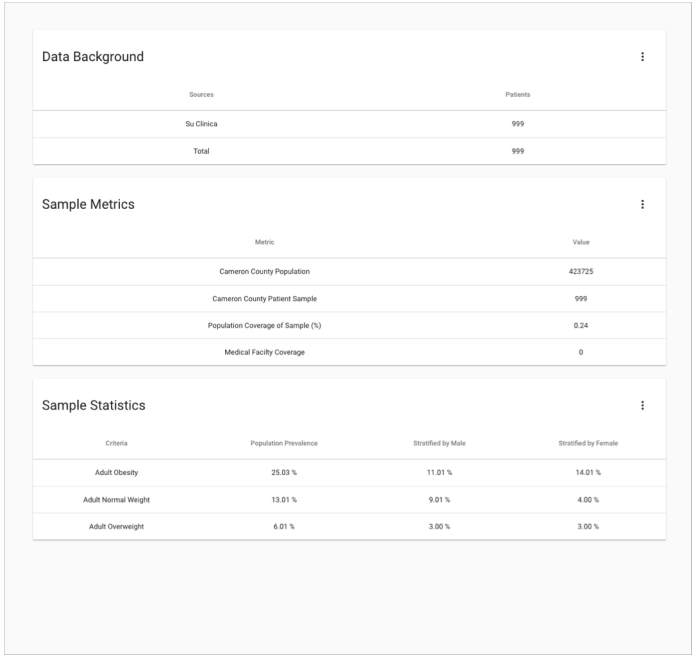
Functionality

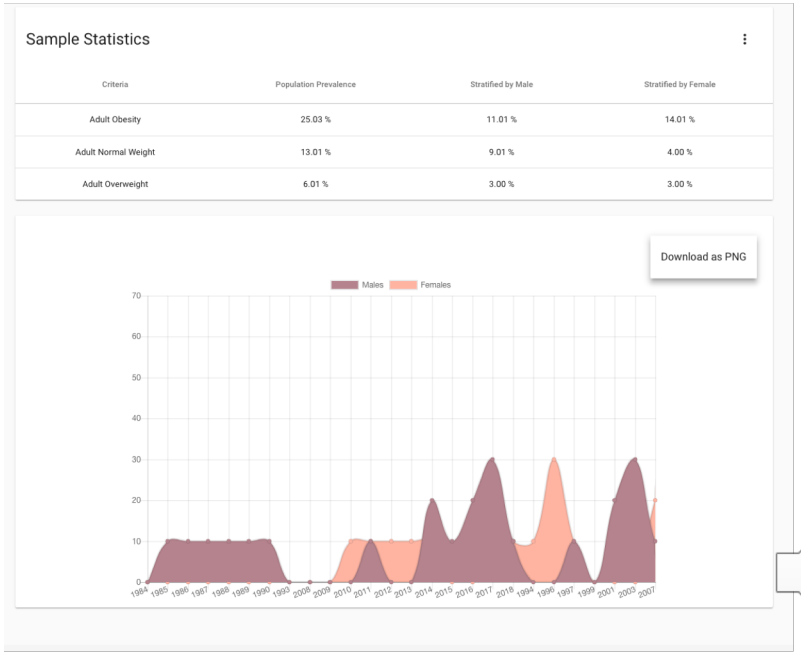
- Containerized Synthea and bulk-data-server to generate and provide data for curator
- Health Assessment UI for Cameron County TX
- Bulk Data import via the new Bulk FHIR export specification, including authentication/authorization via OAUTH2
- Customized domain object conversion from new NdJson format to HAPI FHIR structures
- Curation and snapshot models for the Community Health Assessment
- Deployment to HDAP

Usability

- Each application in the system is portable
- Small amount of prerequisite technology
  - Java, Docker, Docker Compose
- Use familiar industry tools (HAPI FHIR)
- Single page UI
  - Keep it simple, easy to use

Design


Data Background
Sources
Patients
Su Clinica
999
Total
999
Sample Metrics
Metric
Value
Cameron County Population
423725
Cameron County Patient Sample
999
Population Coverage of Sample (%)
0.24
Medical Facilty Coverage
0
Sample Statistics
Criteria
Population Prevalence
Stratified by Male
Stratified by Female
Adult Obesity
25.03 %
11.01 %
14.01 %
Adult Normal Weight
13.01 %
9.01 %
4.00 %
Adult Overweight
6.01 %
3.00 %
3.00 %


Sample Statistics
Criteria
Population Prevalence
Stratified by Male
Stratified by Female
Adult Obesity
25.03 %
11.01 %
14.01 %
Adult Normal Weight
13.01 %
9.01 %
4.00 %
Adult Overweight
6.01 %
3.00 %
3.00 %
Download as PNG
Males
Females
70
60
50
40
30
20
10
0
1984
1985
1986
1987
1988
1989
1990
1993
2008
2009
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Demo

Link to YouTube Video

https://www.youtube.com/watch?v=mE1y3c2Cm4A&feature=youtu.be