Rural vs. Non-Rural Hospitals

Refined Problem Statement

This project will analyze the cost of procedures (rep. codes) within rural and urban hospitals.

Rural hospitals procedure costs will be compared to a specified radius of urban hospitals surrounding them.

As a deliverable, a shoppable dashboard will be created.

After insights are found, the potential for a price factoring model can be explored.

Customer Needs

- HCPS: Healthcare Common Procedure Codes
- CPT: Current Procedural Terminology codes
- DRG: Diagnosis Related Group codes

Primary – The customer needs to be able to understand and visualize the deciding factors between hospitals for their unique procedure. The dashboard will take user inputs and output the best suited options for their situation.

Secondary – The customer will be able to see the difference in prices between services. The dashboard will show CPT/DRG codes and compare rural/urban hospitals.

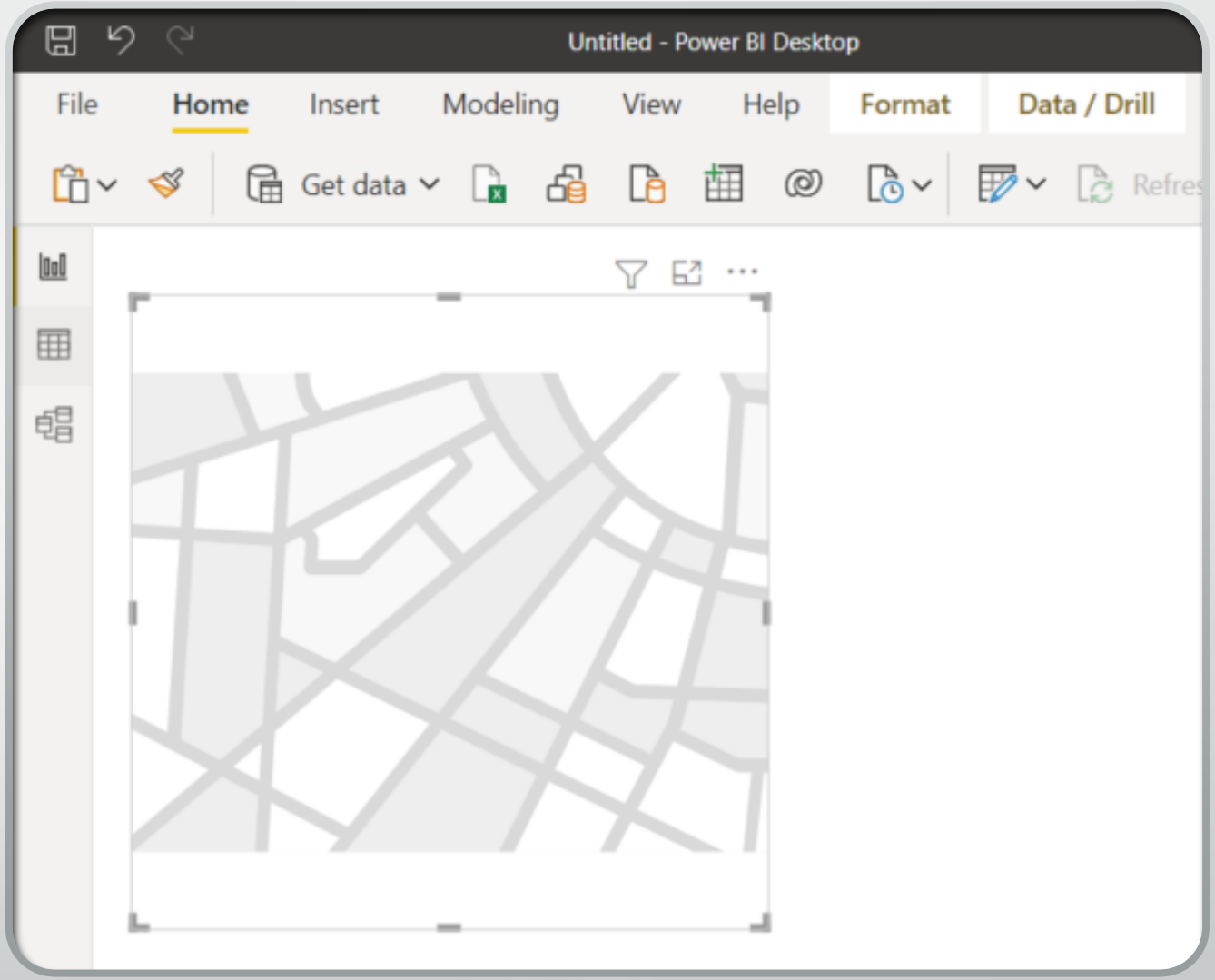
Latent – The customer should not have to deal with unorganized, hard to understand medical jargon presented to them by the hospitals.

Identification of Weighted Evaluation Criteria

- Accuracy of the model in comparing hospital prices (50%)
- Dashboard provides desired information to users (30%)
- Dashboard is simple and easy to navigate for users (20%)
- Model contains data for many hospitals (10%)

Dashboard Prototype

- Workable Dashboard in Power BI to compare rural and urban hospitals procedure costs.
- This will allow the user to input their information and find the best suited choice for their situation.
- Will show the Cash price and Medicare baseline cost for future procedures someone is shopping for.



Data Requirements

- Urban hospitals are located within 50 miles of rural hospitals
- Data contains HCPS/CPT codes
- Data is accessible for most of the nearby urban hospitals
- Data is simple and consistent between hospitals

Example of usable data set

- Data from HCA Florida West Palm Beach Hospital.
- Basis for how simplified the data set should be when pulled from the hospital's website.

Last Full Update: 9/6/2023 3:07:57 PM Last Revision Date: 10/11/2023 1:27:12 PM

Procedure ID	HCPCS/CPT Code	Description	Gross Charge	Discounted Cash
624	0G0378	OBS PER HOUR	121	121
627	0G0379	DIRECT REFERRAL TC	121	121
628		RM & BD ISOLATION	3181	3181
629		RM & BD PRIVATE	2489	2489
634		PRIVATE RM W/TELE	2616	2616
652		RM & BD SEMI PVT	2495	2495
655		RM & BD SEMI PVT A	2314	2314
670		INTERMEDIATE ICU	6129	6129
678	0G0378	OBS PER HOUR	121	121
681	0G0379	DIRECT REFERRAL TC	121	121
683		RM & BD ISOLATION	3181	3181
684		RM & BD PRIVATE	2498	2498
686		RM & BD ISOLATION	2945	2945
687		RM & BD PRIVATE AI	2314	2314
688		PRIVATE RM W/TELE	2816	2816
691		RM & BD SEMI PRIVA	2494	2494
692		RM & BD SEMI PRIVA	2314	2314
872	0G0378	OBS W/TELE PER HR	121	121
873	0G0379	DIRECT REFERRAL TC	121	121
885		RM & BD SEMI PRIVA	2495	2495
887		RM & BD SEMI PRIVA	2314	2314
889		SEMI-PVT RM W/ TEI	2616	2616

Data Dictionary

Field_Name	Field_Label	Data_Type	Description	Field_Size	Data_Codes
ID	HCPS/CPT	string	Describes procedure	8	1. CPT 2. GPCS/CPT 3. HCPS/CPT/DRG
NAME	Hospital	string	Hospital Name	50	N/A
COUNTY	County	string	County Name	50	N/A
POP	Population	int	Census population for that county located	7	N/A
PRICE_B	Price_Before	float	Price of procedure before discount	5	N/A
PRICE_A	Price_After	float	Price of procedure after discount	5	N/A
DISCOUNT	Discount_Nam	string	Insurance company name/reason	40	N/A
CATEGORY	Category	string	Classifies area around hospital as rural, town, urban, ect	50	Town = 31 Fringe, 32 Distant, 33 Remote
BEDS	Bed_Number	int	Amount of beds offered in hospital	4	N/A
INSUR	Insurance	float	The percent of people who have health insurance in that county	4	N/A

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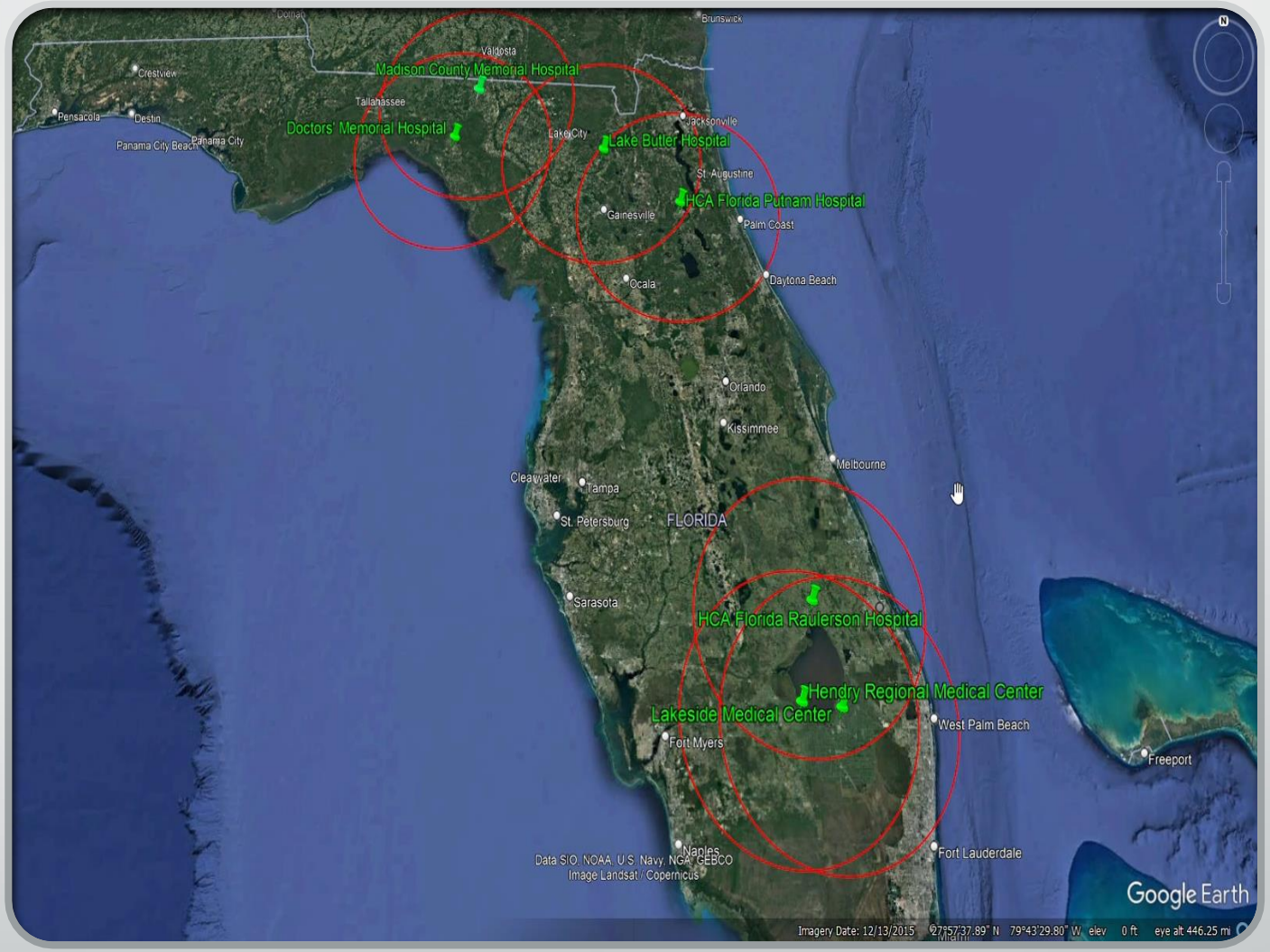
- CPT: Current Procedural Terminology codes
- DRG: Diagnosis Related Group codes

Market Visualization

- Dynamically adjustable
- Shows Competition
- Presentable



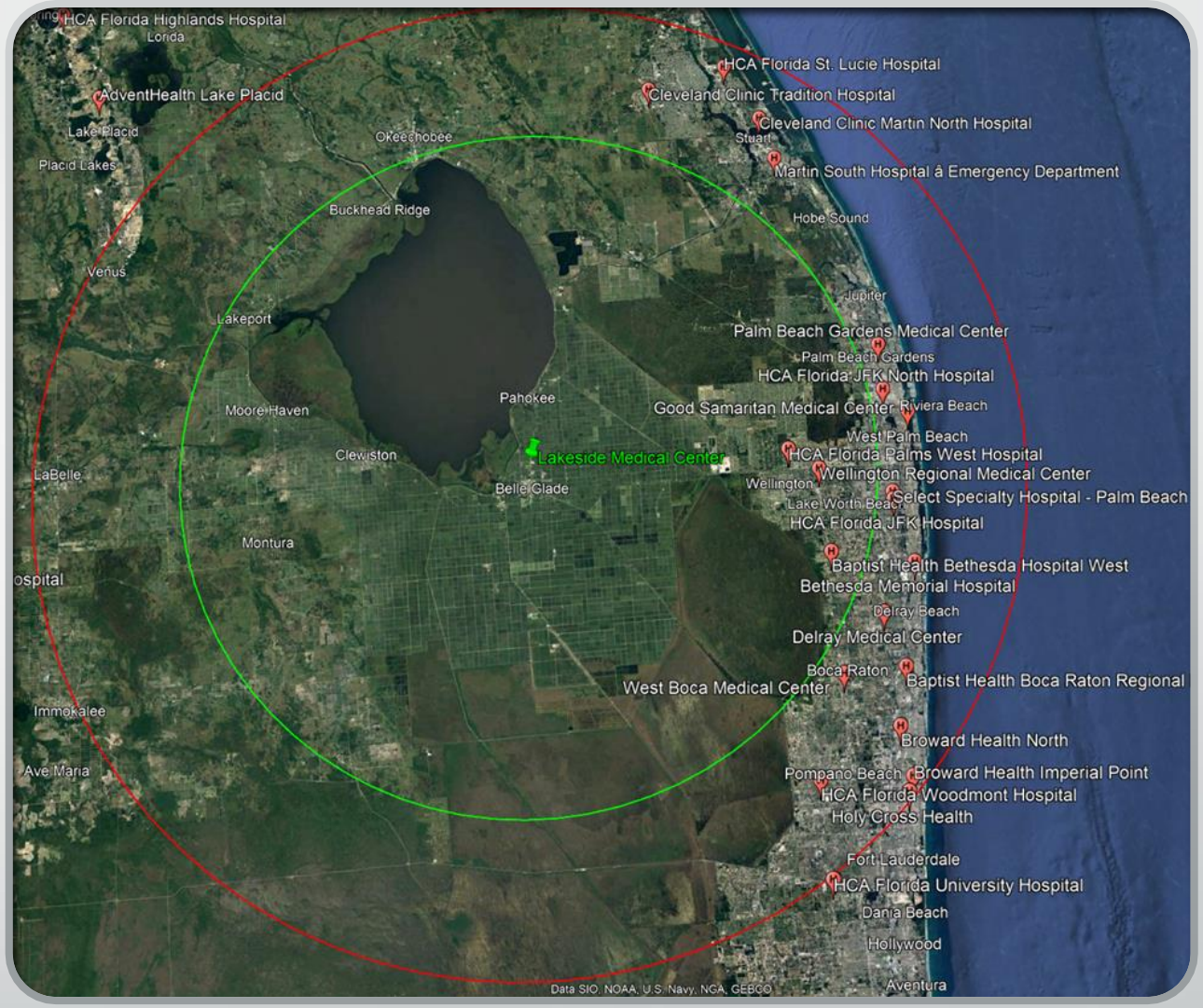
Concept Variation

Evaluating locations:

35-mile radius

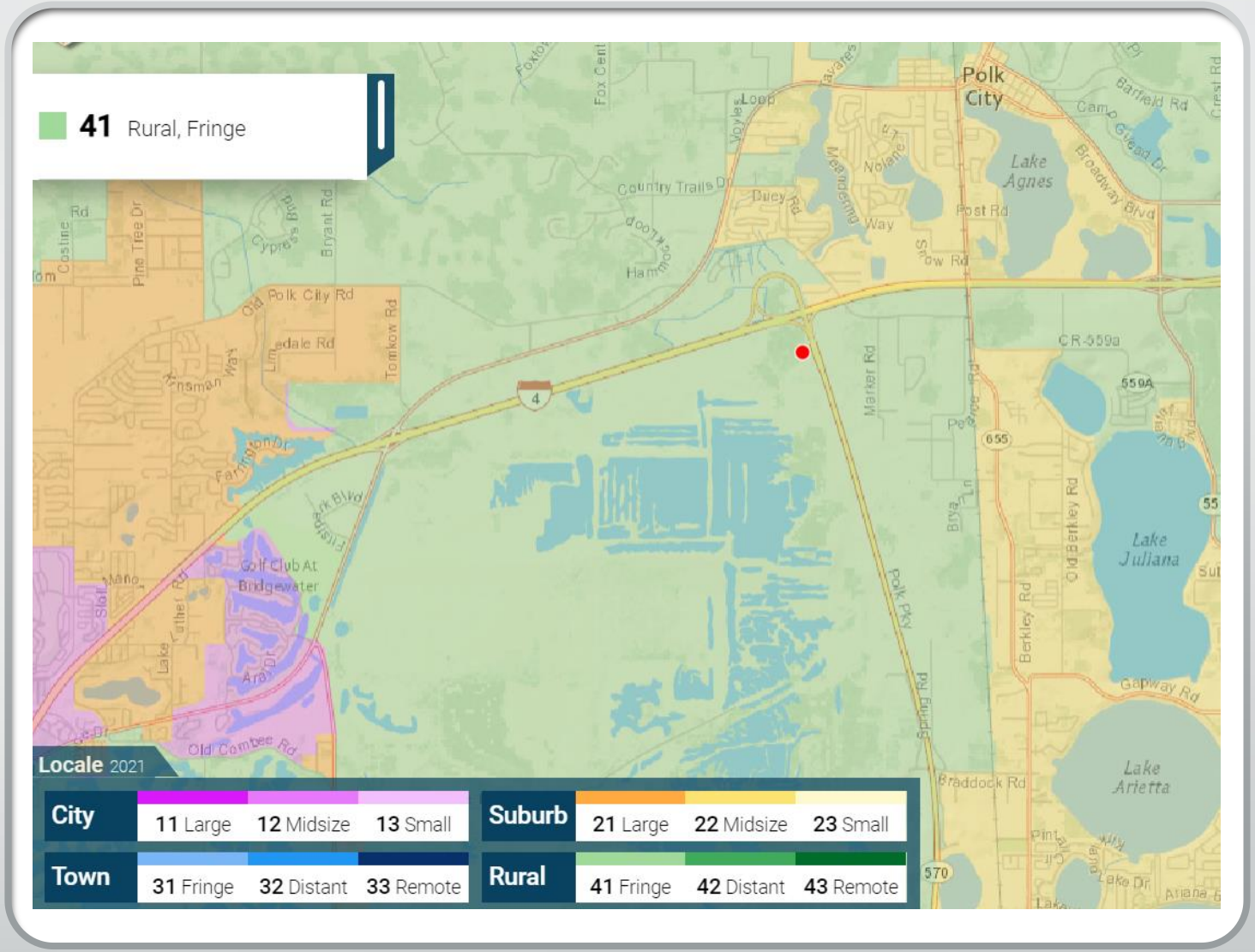
vs.

50-mile radius

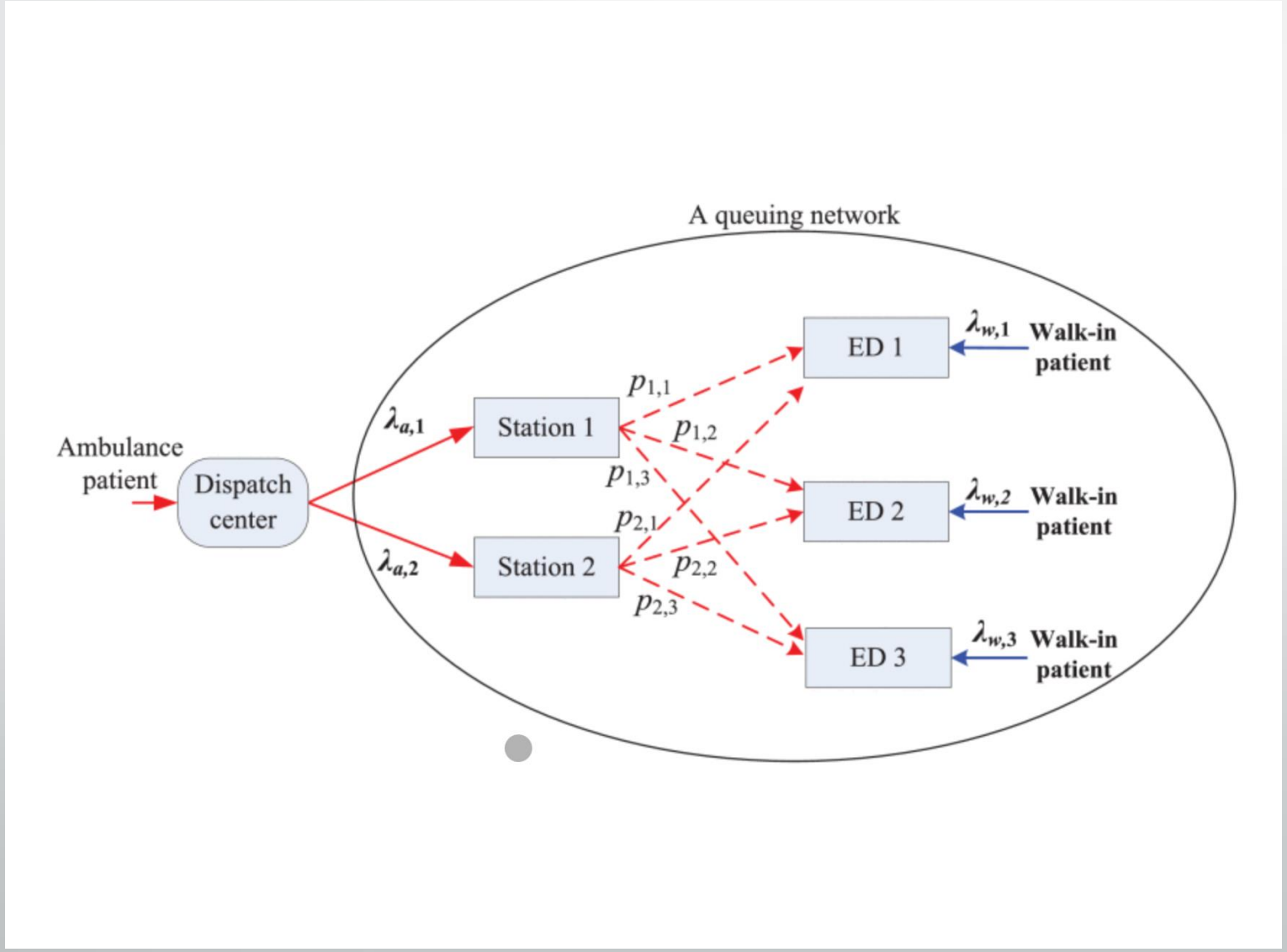


Comparison Variations

- Better classification of local areas based on government data
- More specific than zip code demographics
- Breaks down hospital comparison into Urban, Suburb, Town, Rural and more



CTMC Model of Queuing Network System

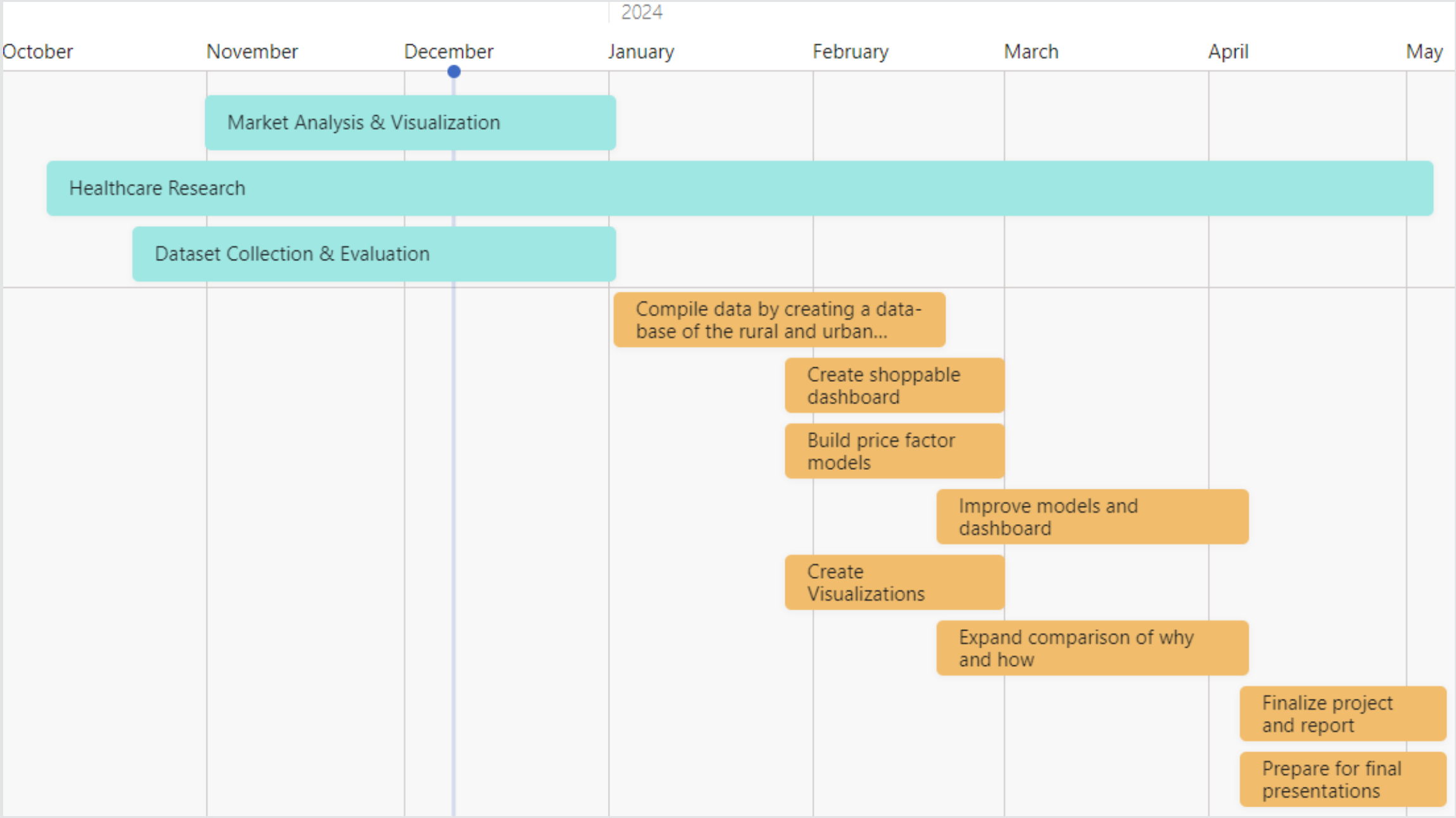


The search for inputs: DRG & CMI

- DRG: Diagnosis-Related Group
- DRGs are fixed
- DRG relative weight: >1 or <1 resource intensity
- Hospital Base payment rate: determined by inputs the healthcare facility pays.
- Used by Medicare and some private insurances.
- DRG's determination of payment: DRG relative weight * hospital base payment rate

- CMI: Case Mix Index
- Medicare uses this to adjust payments to healthcare facilities
- Equation: Sum(DRG relative weight for the healthcare provider)/# discharges.
- Higher CMI: 1: More complexity of procedures treated, 2: Higher reimbursement to the healthcare facility.

Timeline


2024
October
November
December
January
February
March
April
May
Market Analysis & Visualization
Healthcare Research
Dataset Collection & Evaluation
Compile data by creating a data-base of the rural and urban...
Create shoppable dashboard
Build price factor models
Improve models and dashboard
Create Visualizations
Expand comparison of why and how
Finalize project and report
Prepare for final presentations

Thank You!

Questions?