Patient lifetime engagement analysis

Women’s healthcare services provider

Built an automated dashboard to track the patient lifetime revenue (LTR) and key engagement metrics driving the LTR

Women's healthcare services provider company needs to gain in-depth understanding of patient's lifetime engagement

Picture this…

You're looking for a team to assist in performing this analysis and providing insights and a curated list of patients to the marketing team. This will be facilitated by creating an easy-to-use Power BI dashboard with key metrics, allowing the marketing team to perform such analysis on the go. You lacked visibility into how the patients were getting dis-engaged or which services were typically consumed together and what factors are driving patient re-engagement.

You turn to Accordion.

We partner with your team to build an automated dashboard to track the patient lifetime revenue (LTR) and key engagement metrics driving the LTR, including:

1) Collaborating closely with Marketing and Clinical teams to conceptualize women's health specific cohorts and categorized them into Care-based, annual visit compliance based, demography based, time based and service category-based cohorts for enhanced visibility
2) Evaluating the customer behavior by formulating very custom KPIs specific to healthcare such as avg. lifetime revenue, avg. revenue per visit, avg. visits per patient, avg. services per visit and avg. revenue per service across patient cohorts and their trends over time of acquisition and time of service
3) Patient segmentation and behavior analysis is conducting, including disengagement behaviors, basket-mix analysis, affinity analysis, and cohort trend analysis. This helped identify various patterns, trends and derive business insights

Your value is enhanced.

- Your marketing team now has a powerful tool in the form of a Power BI dashboard, enabling them to identify patient cohorts for strategic marketing initiatives, potentially increasing targeting efficiency by up to 50%
- Your business team has gained enhanced visibility into key trends, allowing for a comprehensive analysis of business health and a clear understanding of patient distribution across various cohorts, improving decision-making speed
- You have also significantly reduced the time required to drive marketing initiatives and facilitate quicker decisions, ultimately boosting patient acquisition rates by 30% by utilizing the custom targeted patient lists and highlighted opportunity area for re-engagement

PATIENT LIFETIME ENGAGEMENT ANALYSIS

KEY RESULT

- ~50%. Target efficiency increased
- ~30% patient acquisition rates are boosted

VALUE LEVERS PULLED

- Patient's engagement Journey
- Cohort Analysis
- Patient Behavior analysis

Patient lifetime engagement analysis for women's care enterprises

Patient Lifetime Engagement Analysis

Situation

- The client desired to analyze existing operational data to identify a suitable subset of patients for targeted marketing initiatives to enhance patient engagement. Marketing team was lacking visibility into trends driving new patients and behavior of existing patients
- Client had multiple services and patients across various cohorts, however they lacked visibility into how the patients were getting dis-engaged or which services were typically consumed together and what factors are driving patient re-engagement, etc.
- In this regard, client wanted team to assist in performing this analysis and providing insights and a curated list of patients to the marketing team. This will be facilitated by creating an easy-to-use Power BI dashboard with key metrics, allowing the marketing team to perform such analysis on the go.

Accordion Value Add

- Collaborated closely with Marketing and Clinical teams to conceptualize women's health specific cohorts and categorized them into Care-based, annual visit compliance based, demography based, time based and service category-based cohorts for enhanced visibility.
- Evaluated the customer behavior by formulating very custom KPIs specific to healthcare such as Avg. Lifetime revenue, Avg. Revenue per visit, avg. visits per patient, avg. services per visit and avg. revenue per service across patient cohorts and their trends over time of acquisition and time of service.
- Patient segmentation and behavior analysis were conducted, including disengagement behaviors, basket-mix analysis, affinity analysis, and cohort trend analysis. This helped identify various patterns, trends and derive business insights.

Impact

- The marketing team now has a powerful tool in the form of a Power BI dashboard, enabling them to identify patient cohorts for strategic marketing initiatives, potentially increasing targeting efficiency by up to 50%.
- The business team gained enhanced visibility into key trends, allowing for a comprehensive analysis of business health and a clear understanding of patient distribution across various cohorts, improving decision-making speed.
- This will significantly reduce the time required to drive marketing initiatives and facilitate quicker decisions, ultimately boosting patient acquisition rates by 30% by utilizing the custom targeted patient lists and highlighted opportunity area for re-engagement.

Methodology/ Approach (1/2)

Identification of Cohorts

Time based cohorts

The common characteristic for time-based cohorts is the acquisition period. The acquisition period is considered based on the patient's first visit date.

Demography based cohorts

The common characteristic for a demography-based cohort are the demographic variables of the patients.
E.g. - Age at acquisition, Unit/Region, Provider, Primary Insurance, Race/marital status, etc.

Care based cohorts

Patients are grouped into cohorts and their sub-cohorts based on the care/services received.

1. Pregnancy - Age bracket, Delivery/ Non-Delivery, First Pregnancy related Service Vs Subsequent Pregnancies
2. Non-Pregnancy - Cancer Care, Annual visits, Problem Visit – E&M, Surgery (excluding Pregnancy related

Compliance based cohorts

Based on Compliance: Compliant Vs Non-Compliant cohort

Identification of patients to be included in cohorts

Identify the patients to be included in the cohorts based on assumptions (listed in next slide)

↓

Eliminate patients that do not fit the criteria of the cohort definition/limitations

↓

Cohort finalized for Lifetime Revenue Calculation

Calculation of Cohort LTR

Lifetime (LT) of a patient for a cohort can be calculated as:

Point where the cumulative LTR curve starts plateauing would be considered as the Lifetime of the cohort

↓

Lifetime revenue (LTR) per patient at a given time is calculated as:

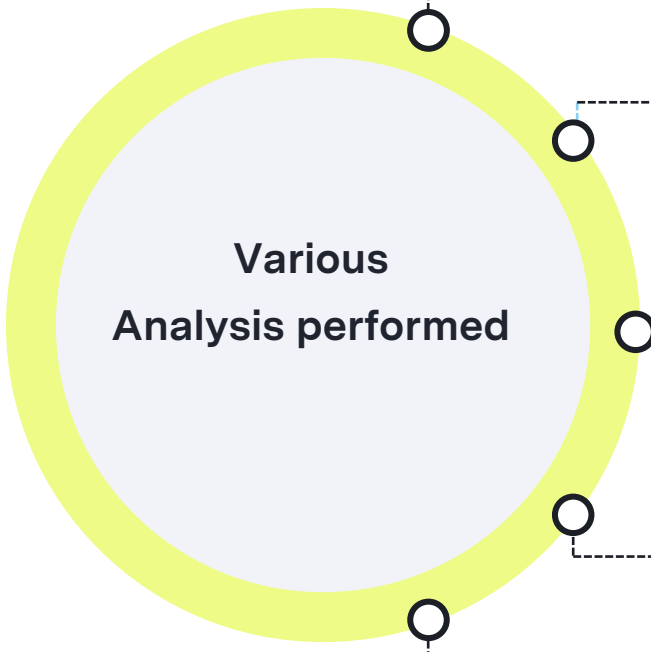
LTR = Avg. Revenue per visit * Visits per patients

Avg. Rev. per visit = Avg. CPT codes per visit * Avg. revenue per CPT code

↓

The LTR and other related metrics for a patient cohort are calculated and trends are identified

Methodology/ Approach (2/2)



01

Cohort trends – Various components of LTR are plotting against MSA (months since acquisition) and any spike or anomalies are analyzed for correlation with the factor influencing the deviation.

02

Behavior analytics – Charts were plotted to observed what services patients enter, how are they various over various types of demography

03

Segmentation – Segmented revenue into very low, low, medium, high and very high. These segments variation and trends were observed over demographic segmentations and across all the regions

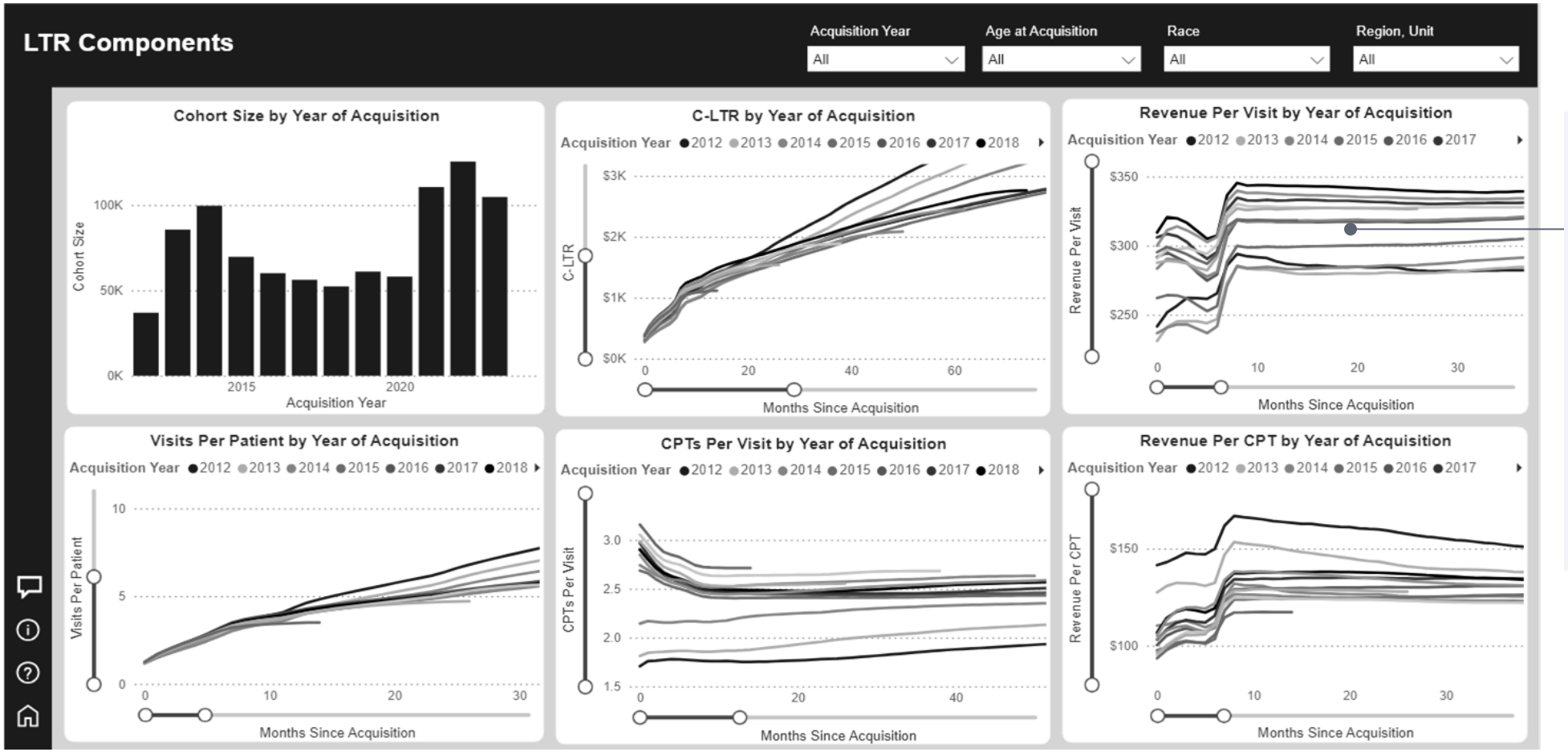
04

Basket mix analysis – Services were observed from the lens of which services are consumed usually by a patient cohort and how these service journey varies across patients

05

Affinity analysis – Co-occurring services were observed and if those frequencies give us any cohort which stands out was analyzed across a patient journey

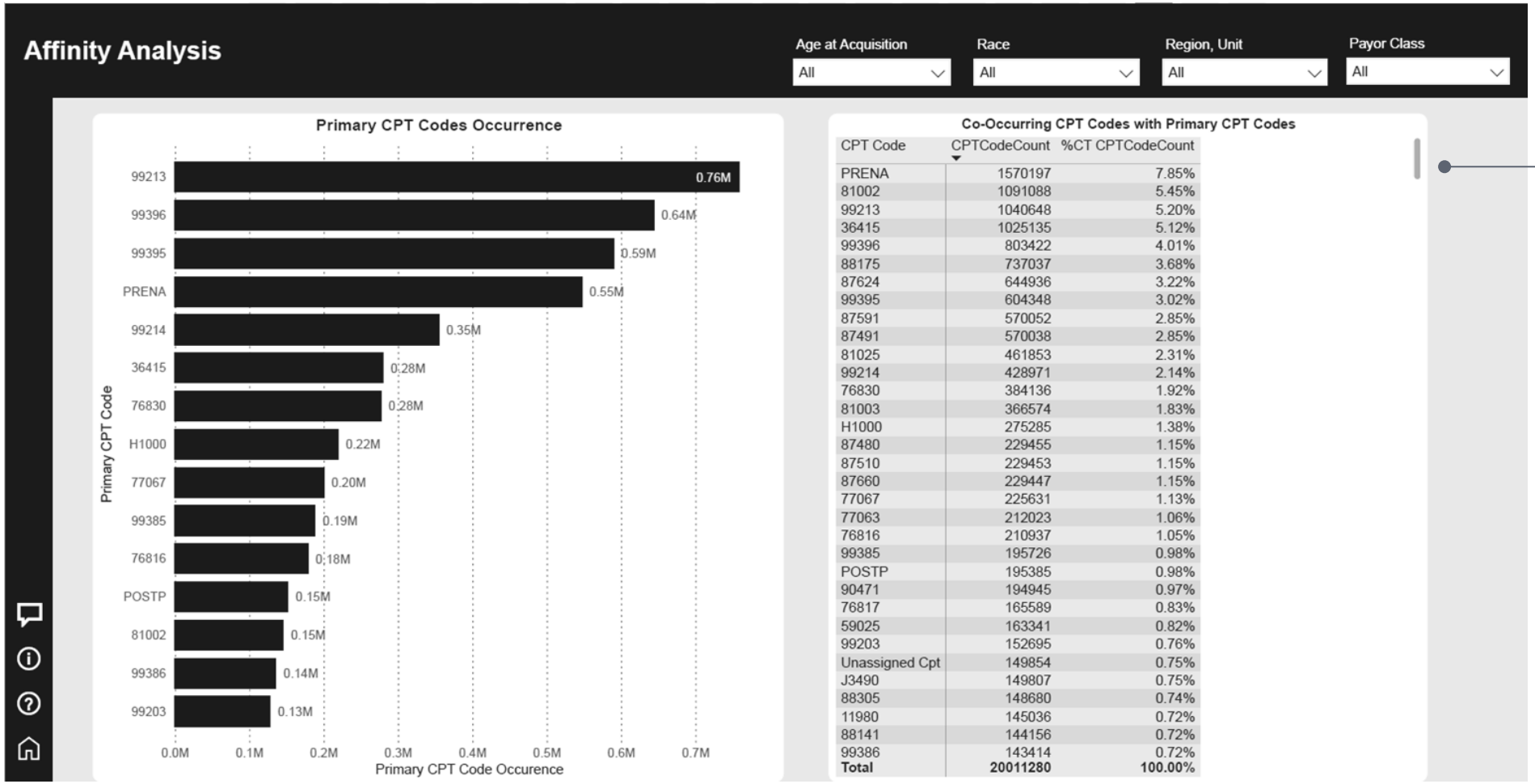
Lifetime revenue trend analysis



Each component of LTR is plotted against Month since acquisition to see trends in component over the patient journey
User can analyse the trends by patient demography and behaviour/ Services at Entry & Exit.

Example:
We can see spikes in revenue per visit and revenue per CPT after 6-8 months since acquisitions majorly showing patients coming for delivery (OB-GYN) treatment

Patient service utilization analysis

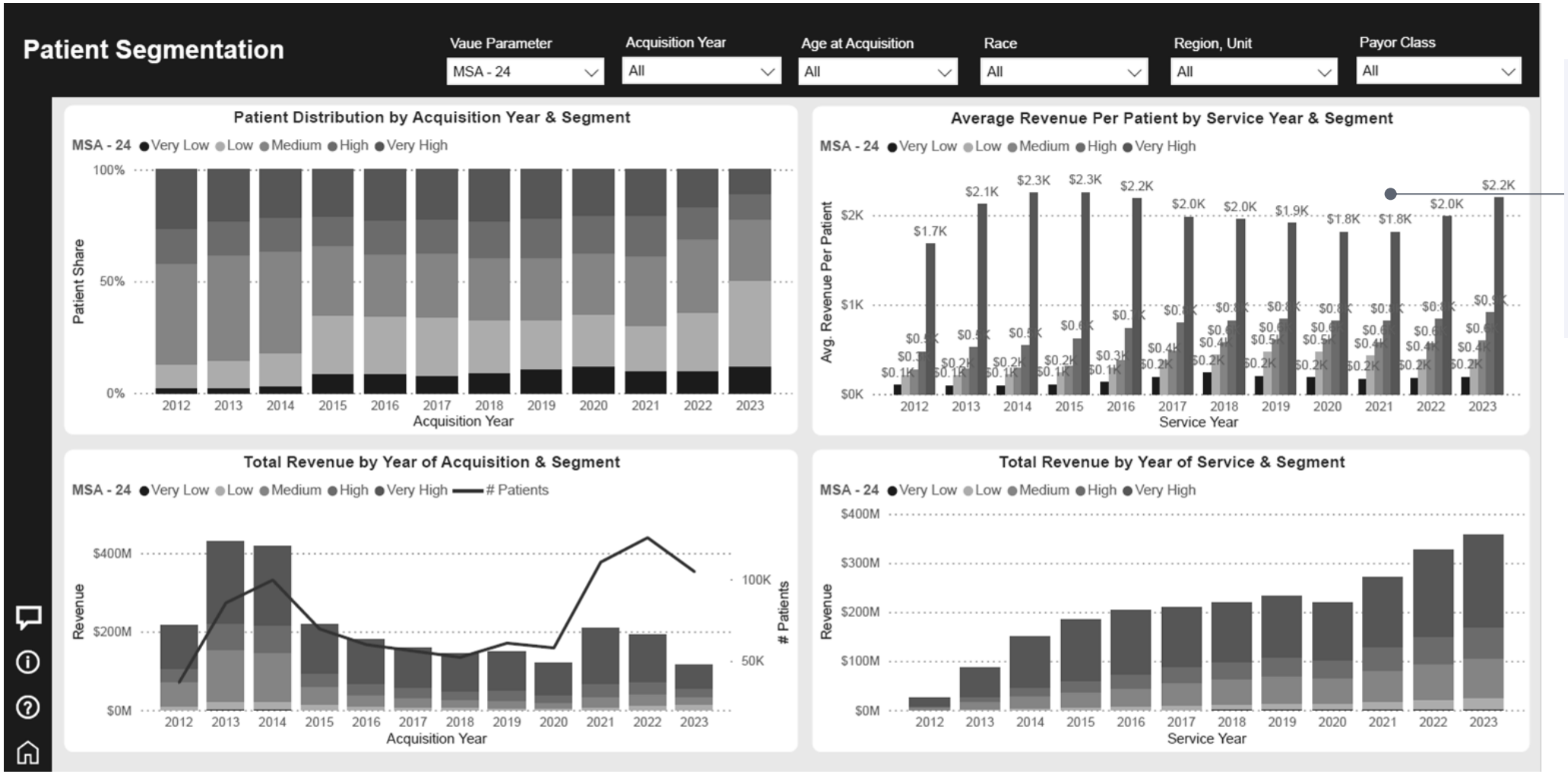


Co-Occurring CPT Codes with Primary CPT Codes

CPT Code	CPTCodeCount	%CT CPTCodeCount
PRENA	1570197	7.85%
81002	1091088	5.45%
99213	1040648	5.20%
36415	1025135	5.12%
99396	803422	4.01%
88175	737037	3.68%
87624	644936	3.22%
99395	604348	3.02%
87591	570052	2.85%
87491	570038	2.85%
81025	461853	2.31%
99214	428971	2.14%
76830	384136	1.92%
81003	366574	1.83%
H1000	275285	1.38%
87480	229455	1.15%
87510	229453	1.15%
87660	229447	1.15%
77067	225631	1.13%
77063	212023	1.06%
76816	210937	1.05%
99385	195726	0.98%
POSTP	195385	0.98%
90471	194945	0.97%
76817	165589	0.83%
59025	163341	0.82%
99203	152695	0.76%
Unassigned Cpt	149854	0.75%
J3490	149807	0.75%
88305	148680	0.74%
11980	145036	0.72%
88141	144156	0.72%
99386	143414	0.72%
Total	**20011280**	**100.00%**

Helps us understand the most frequently utilized services by the patients

Revenue based patient segmentation

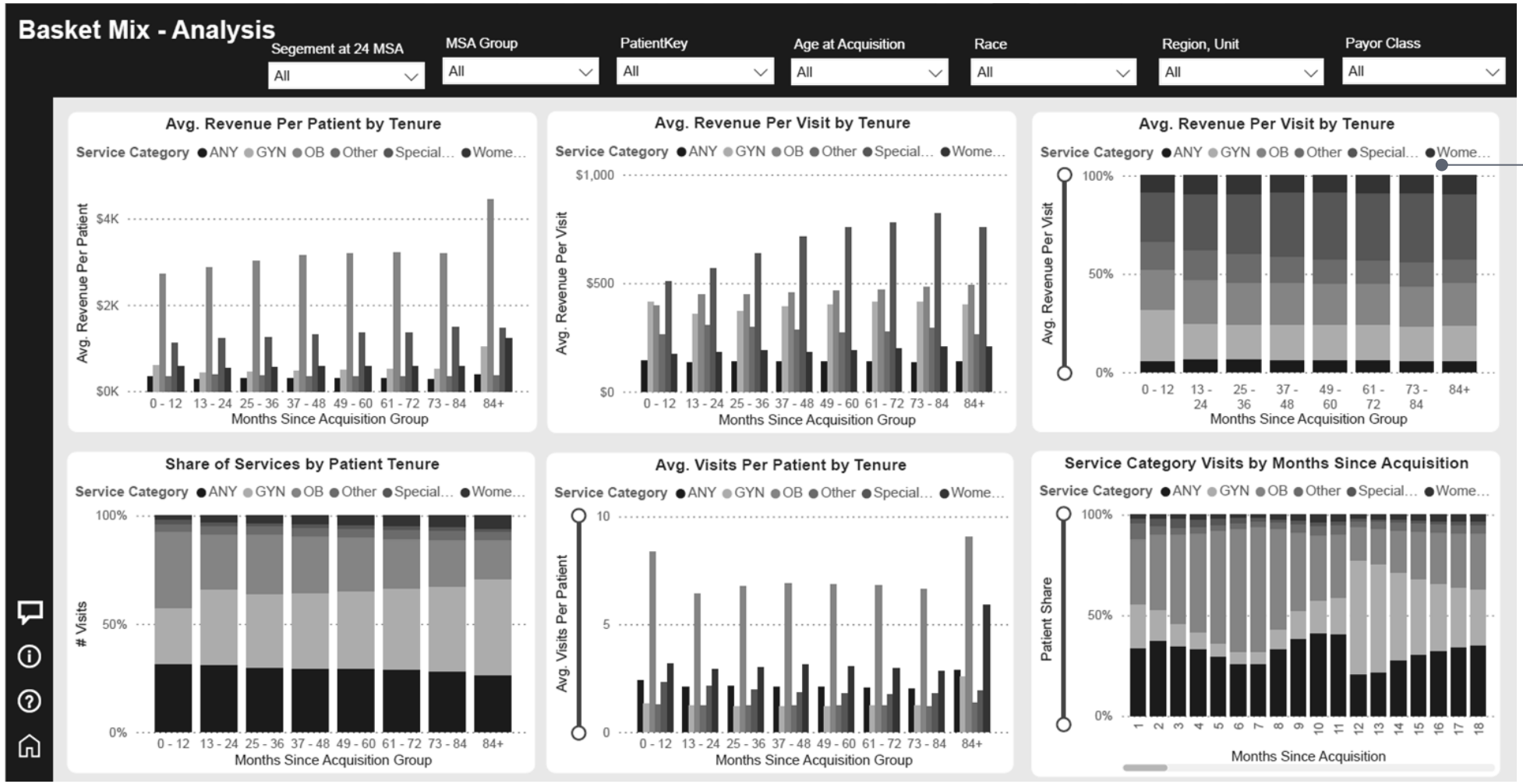


Patient segmentation helps understand trends in behaviour based on revenue generated by patients

Example:
We see that patients bringing low revenue have increased over time.

Patients are segmented from very low to very high categories based on the revenue generated in the first 24/36 months of engagement.

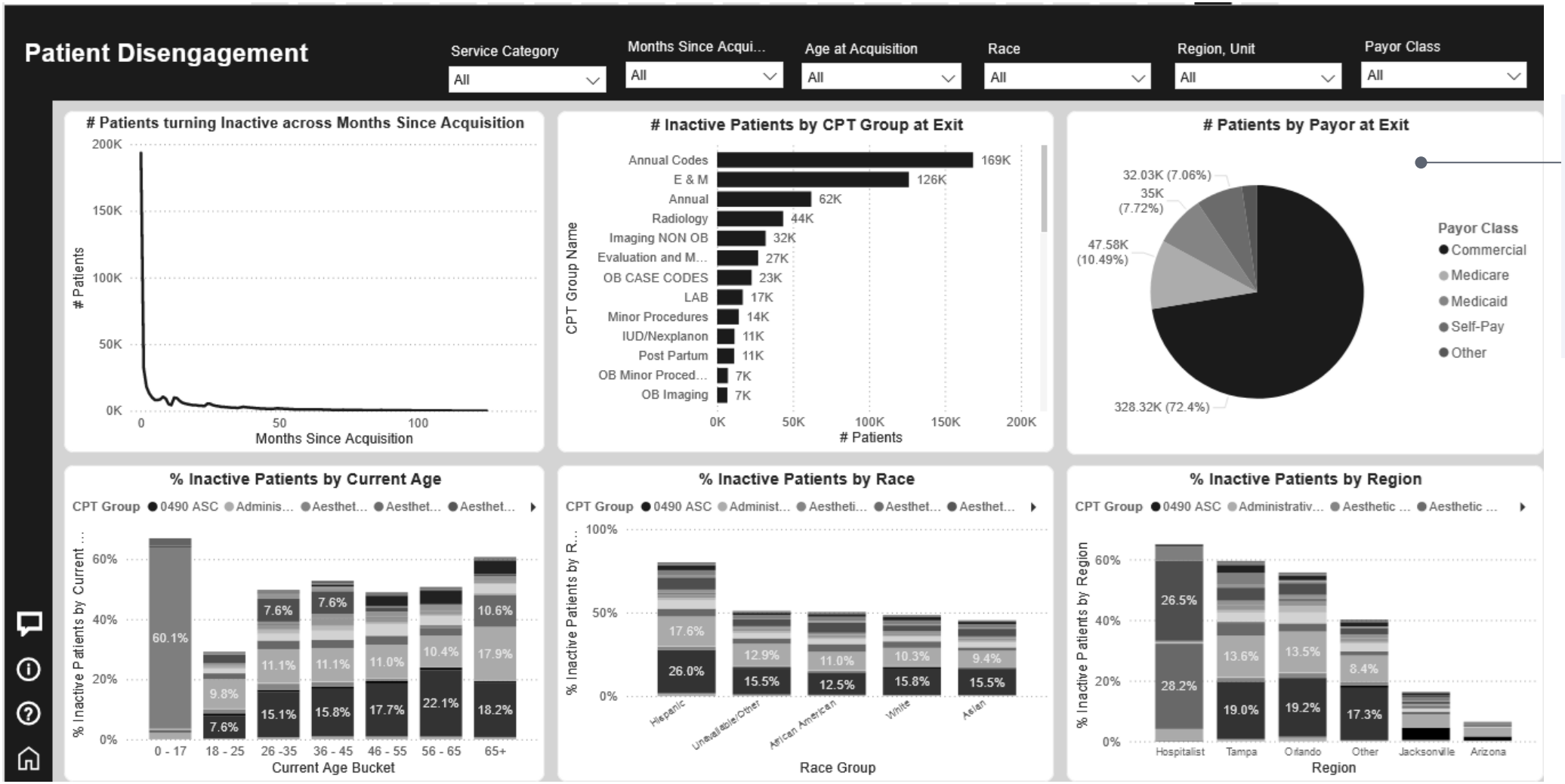
Analyzing services combination consumed



Helps us understand the services which are usually consumed in combination by the patients

Example:
We can see that OB and GYN services are mostly consumed together

Patient dis-engagement analysis



This analysis helps dig deeper into various attributes related to patients at the time of exit. Such as the last service availed, insurer, age and which month since acquisition

Targeted patient groups for marketing

Target Groups

Age at Acquisition: All | Race: All | Region, Unit: All | Payor Class: All

Annual Checkup Target Group

PatientKey	First AgeBucket	Months Since Last Service	First PregnancyFlag_FS	First Provider_LS	Unit_
NF-1000002	46-55	39	False	CF-9165	7
NF-1000013	26-35	51	False	CF-1418847	11
NF-1000028	46-55	44	False	CF-1418941	11
NF-1000056	46-55	41	False	CF-1418958	11
NF-1000069	36-45	14	False	CF-1418738	22
NF-100010	56-65	19	False	NF-767906	11
NF-1000104	46-55	27	False	CF-1412815	11
NF-1000114	46-55	40	False	CF-1418847	11
NF-1000116	36-45	38	False	CF-1418876	11
NF-1000117	56-65	38	False	CF-1418876	11
NF-1000118	56-65	39	False	CF-1418876	11

OB Services Target Group (Age:20-35)

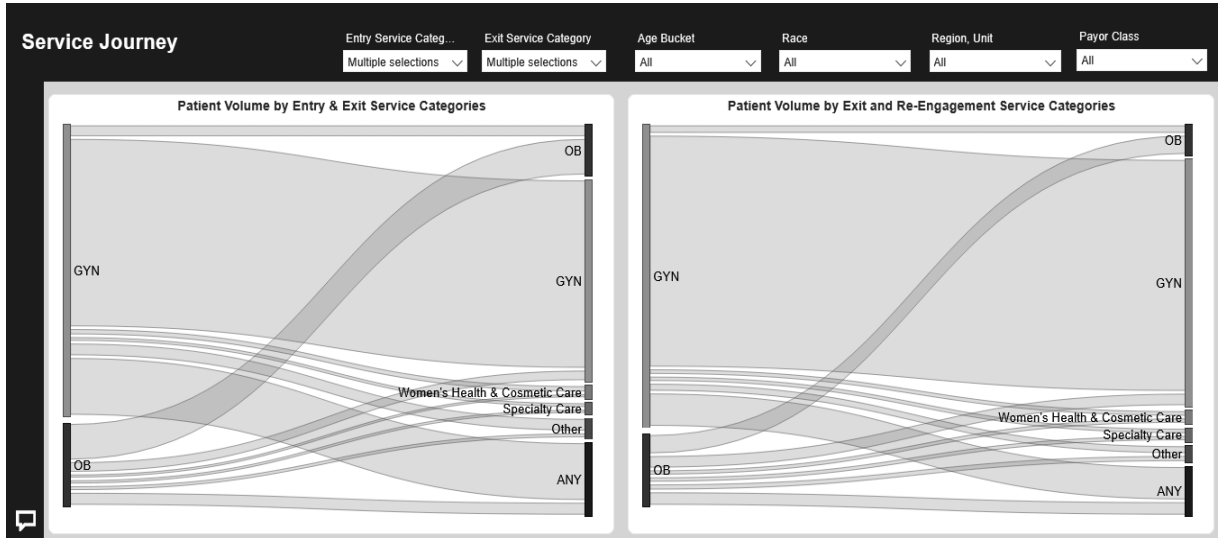
PatientKey	First AgeBucket	Patient Current Age	First PregnancyFlag_FS	First Provider_LS	Unit_LS
NF-1000007	26-35	35	False	NF-777735	11100
NF-1000542	26-35	35	False	CF-1418897	11100
NF-1000947	26-35	35	False	NF-777582	11100
NF-1001600	26-35	35	True	NF-777735	11100
NF-1001615	26-35	35	False	CF-1418897	11100
NF-1002562	26-35	35	False	NF-777625	11100
NF-1002695	26-35	35	False	CF-1418958	11100
NF-1003346	26-35	35	False	CF-1574072	9991
NF-1003766	26-35	35	False	NF-777625	11100
NF-1004597	26-35	35	False	NF-2085759	11100
NF-1004929	26-35	35	False	CF-1418897	11100
NF-1004962	26-35	35	False	NF-777522	11100

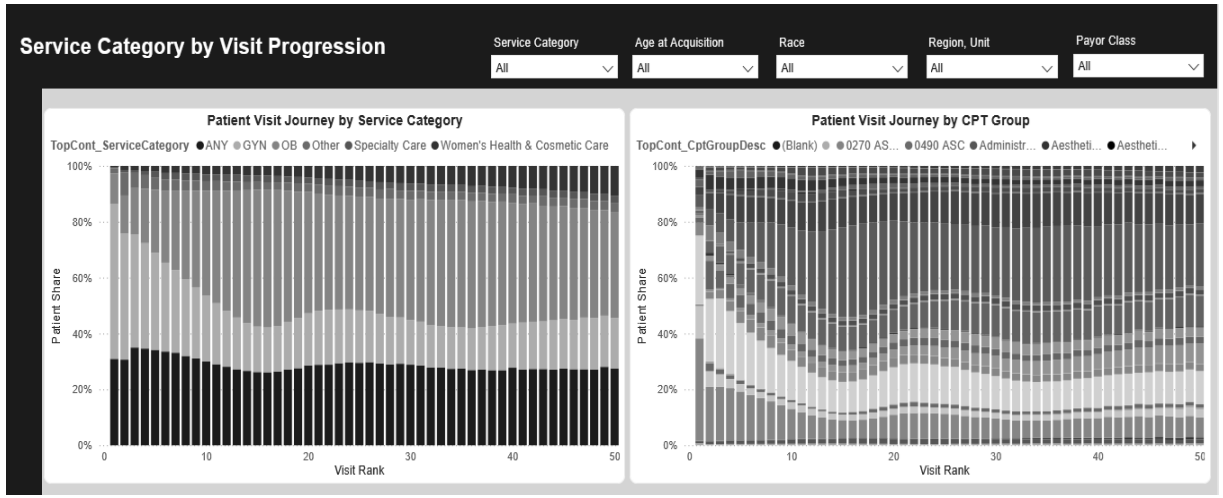
GYN Services Target Group (Age:35+)

PatientKey	First AgeBucket	Patient Current Age	First PregnancyFlag_FS	First Provider_LS	Unit_LS
NF-1000010	26-35	36	False	NF-777522	11100
NF-1000131	26-35	36	True	NF-777735	11100
NF-1000883	26-35	36	False	CF-1625320	11100
NF-1000916	26-35	36	False	CF-1418897	11100
NF-1001393	26-35	36	False	CF-1625320	11100
NF-1001736	26-35	36	False	NF-826568	11100
NF-1002314	26-35	36	False	NF-777744	1100
NF-100248	26-35	36	False	NF-9189	11020
NF-100266	26-35	36	False	NF-837292	11026
NF-1003014	26-35	36	False	CF-9252	5300
NF-1003242	26-35	36	False	NF-777677	11100
NF-1003314	26-35	36	False	NF-777735	11100
NF-1003660	26-35	36	False	CF-1418941	11100

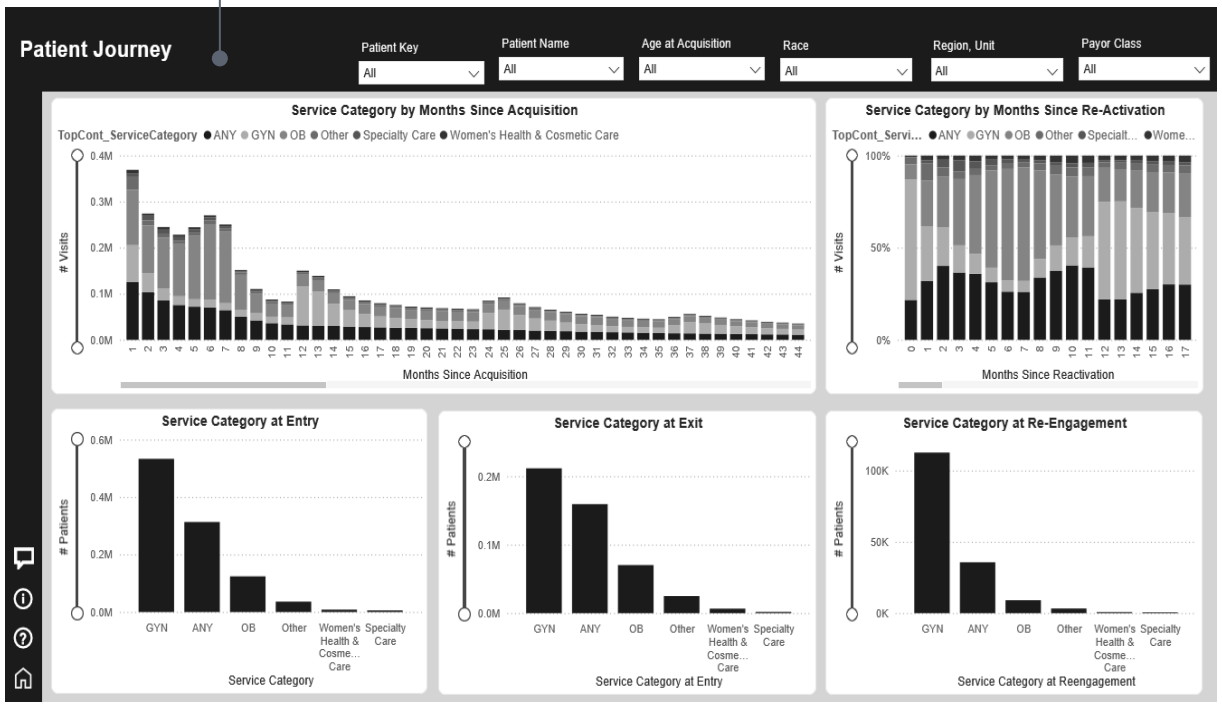
One of the output of the analysis was to provide targeted list of patients for strategic marketing initiatives basis few patterns in patient journey.
Examples:
35+ age group patients can be re-targeted for post partum services after delivery
Annual Check-up patients who are regular to visit each year can be further targeted for specific services basis their history
Patient n age group 20-35 are more likely to need help on OB services

Patient journey across lifetime

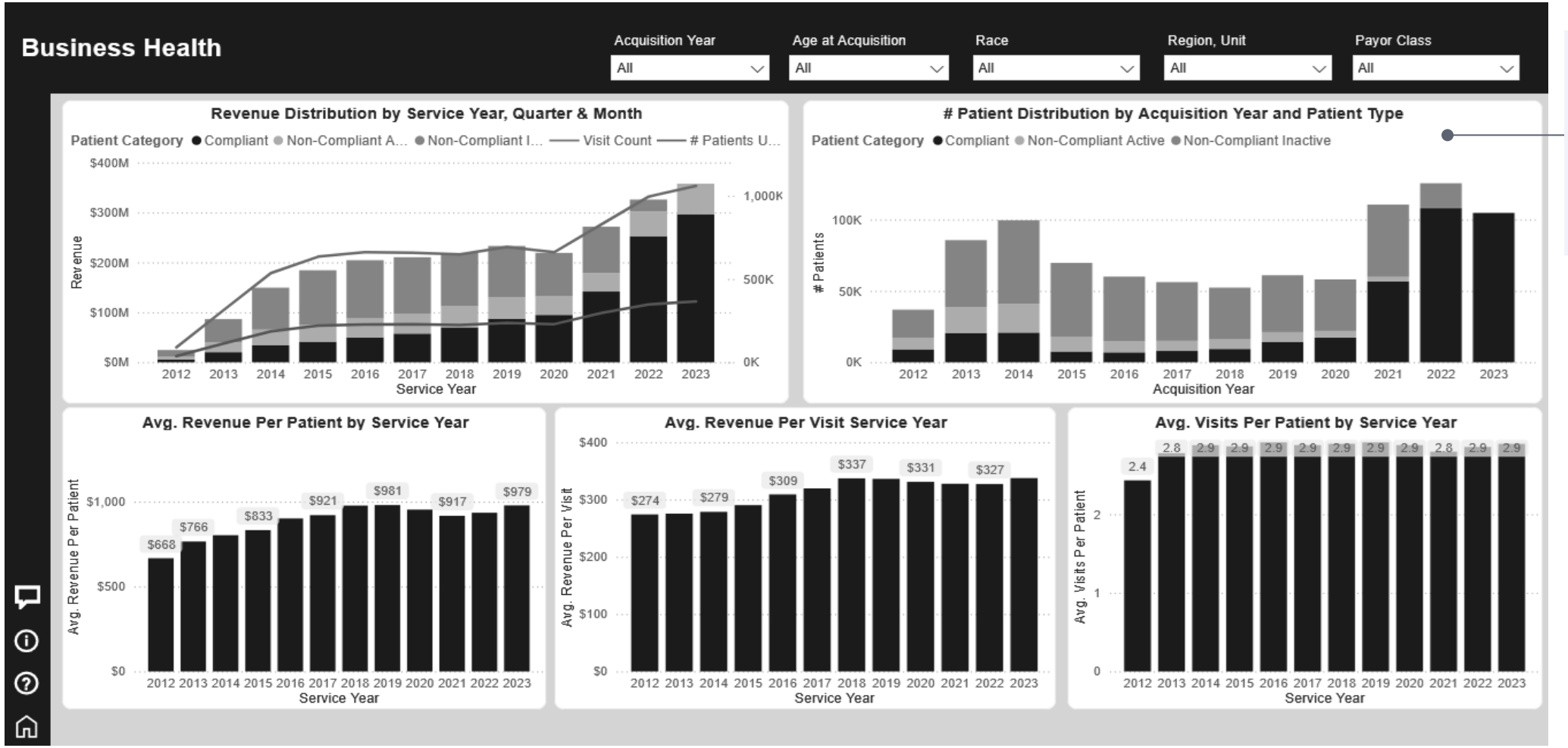




Over patient's journey since the time of first visit, we can analyze which services are consumed at various stages and how is that resulting to exit or re-engagement



Complaint vs non-complaint patient distribution



We can see revenue trend for complaint customers is showing on growing over the years, showing strong co-relation between complaint patients and their service consumption pattern

Complaint Patients – Patients who come for subsequent visits within 24 months
Non-Complaint Active Patients – Patients with at least once in their overall journey were non-compliant but are active currently