GROUP 1

DIALYSIS OF PATIENTS

1

HEALTHCARE DOMAIN

GROUP MEMBERS

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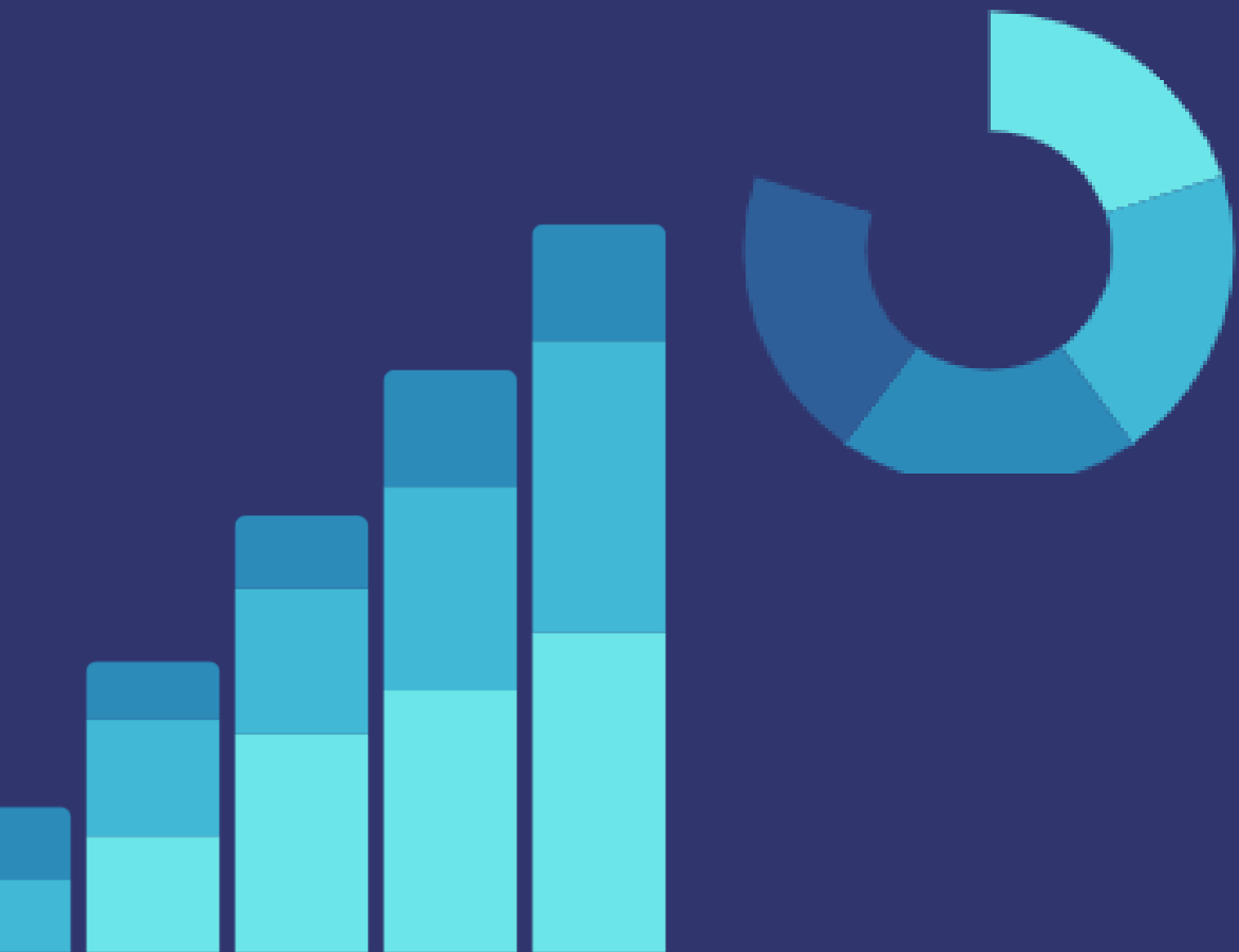- Sravani Bolla

TABLE OF CONTENT

CONTENT	SLIDE NUMBERS
Introduction	4
Key performances indicators	5,6,7,8,9,10
Excel dashboard	11
Power bi dashboard	12
Tableau dashboard	13
MySQL queries	14,15
Conclusion/inferences	16
Challenges faced in internship period	17

INTRODUCTION

- We have given two data set named dialysis 1 & dialysis 2 of data type csv and each data set contains 7k+ records.
- Used power query option to merge the two data sets using common column (provider number in dialysis1 and CMS Certification number in dialysis 2) and for data manipulating.

KPI 1

Number of Patients across various summaries

INFERENCE: The KPI1 data indicates strong survival outcomes with 1.94 million patients, reflecting effective treatment strategies. High catheter and fistula usage highlight common interventions in chronic kidney disease management. The prevalence of metabolic complications, like hypercalcemia and serum phosphorus imbalance, emphasizes the need for ongoing focus in these areas.

VARIOUS SUMMARY	NUMBER OF PATIENTS
nPCR	980
Catheter	596565
Transfusion	421791
Survival	1937701
Fistula	596383
Hospitalization	494578
Serum Phosphorus	663878
Hypercalcemia	633918

KPI 2

Profit Vs Non-Profit Stats

PROFIT/non-PROFIT	COUNT OF PROFIT OR non-PROFIT	PERCENTAGE
Non-profit	869	11.25%
Profit	6854	88.75%
Grand Total	7723	100%

INFERENCE: The KPI2 data shows majority of entities are profit-oriented, with 88.75% of the total. Non-profit entities make up only 11.25% of the total. This indicates a significant skew toward profit-driven organizations.

KPI 3

CHAIN ORGANIZATIONS W.R.T. TOTAL PERFORMANCE SCORE AS NO SCORE

INFERENCE: The KPI3 data provides a summary of dialysis providers and their corresponding total performance scores. The majority of the scores are concentrated among a few large providers, with DaVita and Fresenius Medical Care contributing significantly to the total count. Independent providers also account for a notable portion, while many smaller providers contribute only a single score each. The data highlights the dominance of a few key players in the dialysis market.

TOTAL PERFORMANCE SCORE AS NO SCORE	COUNT
• Freedom dialysis, LLC • I dialysis, LLC • Upma health system • Innovative dialysis systems • Dialyze direct pa LLC • Nephrology care partners • Sula dialysis • Northwest kidney centers • Diamond dialysis - stafford, texas, llc • Sankar nephrology group	1
Centers for dialysis care	2
Dialyspa	3
American renal associates	6
Dialysis clinic, inc.	8
Us renal care, inc.	16
Atlantis healthcare group	17
Independent	53
Fresenius medical care	118
Davita	119

KPI 4

STATES	SUM OF DIALYSIS STATIONS
CA	15095
TX	14200
FL	8838
GA	6468
NY	6382
PA	5403
NC	5401
OH	5300
IL	4901
TN	3730
Grand Total	75718

Dialysis Stations Stats

INFERENCE: The KPI4 data shows the distribution of dialysis stations across various states, with California (CA) and Texas (TX) having the highest number of stations at 15,095 and 14,200, respectively. Florida (FL) follows with 8,838 stations, while other states like Georgia (GA) and New York (NY) have between 6,000 to 7,000 stations each. The total number of dialysis stations across these states is 75,718, indicating a significant concentration in a few large states.

KPI 5

of Category Text - As Expected

INFERENCE: The KPI5 data indicates majority of dialysis stations are focused on "Patient Hospitalization" and "Patient Hospital Readmission," with over 120,000 stations each. Metrics like "PPPW," "Fistula," and "Patient Transfusion" also have substantial coverage, ranging from 112,000 to 118,000 stations. "Patient Infection" and "SWR" have the lowest numbers, indicating less emphasis on these categories.

| CATEGORY TEXT	SUM OF # OF DIALYSIS STATION
Patient Hospitalization	121152
Patient Hospital Readmission	120702
PPPW	118914
Fistula	118511
Patient Transfusion	112779
Patient Survival	104713
Patient Infection	90889
SWR	74400

KPI 6

AVERAGE PAYMENT REDUCTION RATE

AVERAGE PAYMENT REDUCTION RATE

0.32%

INFERENCE: The KPI6 data shows the average payment reduction rate of 0.32% suggests that dialysis providers generally face minimal financial penalties, indicating overall compliance with performance standards. This low reduction rate reflects a relatively high level of care quality across the board. It also implies that most providers are meeting or closely approaching established benchmarks.

EXCEL DASHBOARD

We utilized pivot tables to filter data and perform mathematical operations on the dataset. For the dashboard, we incorporated slicers and cards along with data visualizers like bar charts and pie charts to enhance the presentation and interactivity.

PATIENTS DIALYSIS DASHBOARD
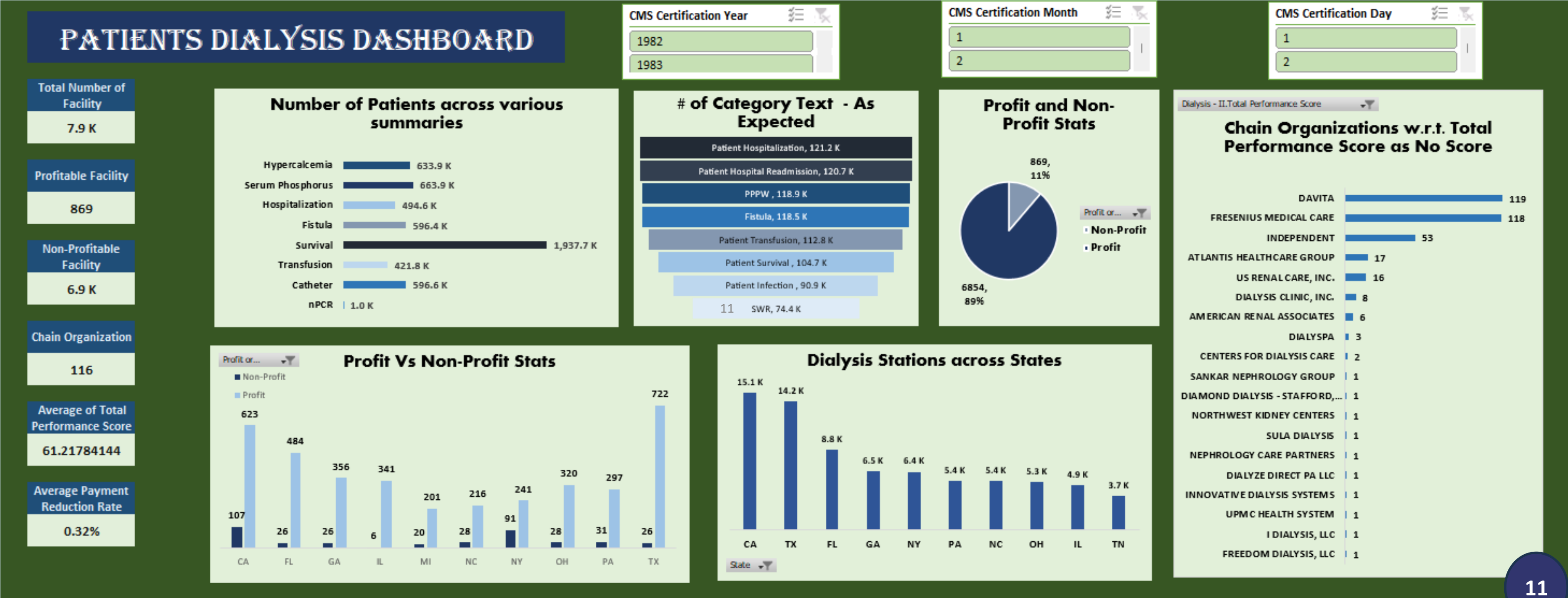
POWER BI DASHBOARD

We connected SQL Server to Power BI Desktop, enabling data visualization and analysis. Additionally, we used DAX formulas where necessary to enhance the insights and functionality of the visualizations.

Dialysis of Patients

6.85K — Sum of Total_Profit

7724 — Count of # of Dialysis Stations

0.32% — First average

Sum of Total by Profit or Non-Profit and Percent

1K (11.25%) — Non-Profit
7K (88.75%) — Profit

Profit or Non-P...
- Profit
- Non-Profit

Sum of Total_Patient by C ... Text

100%
- Hospitalization
- Hospital Readmission
- PPPW
- Fistula
- Transfusion
- Survival
- Infection — 5.01K
- SWR — 3.62K

12 — 53.1%

state	Sum of Total_station
AK	146.00
AL	3,027.00
AR	1,205.00
AS	44.00
AZ	2,407.00
CA	15,095.00
CO	1,335.00
CT	1,045.00
DC	409.00
Total	1,35,055.00

City: All
State: All
County: All

Sum of Number_of_Patients by Various_Summary

- Survival — 1938K
- Serum phosphorus — 664K
- Hypercalcemia — 634K
- Catheter — 597K
- Fistula — 596K
- Hospitalization — 495K
- Transfusion — 422K
- nPCR — 1K

Sum of No_Score by Chain Organization

- DAVITA — 119
- FRESENIUS M... — 118
- INDEPENDENT — 53
- ATLANTIS HEA... — 17
- US RENAL CA... — 16
- DIALYSIS CLINI... — 8
- AMERICAN RE... — 6
- DIALYSPA — 3
- CENTERS FOR ... — 2
- DIALYZE DIRE... — 1
- DIAMOND DIAL... — 1
- FREEDOM DIA... — 1

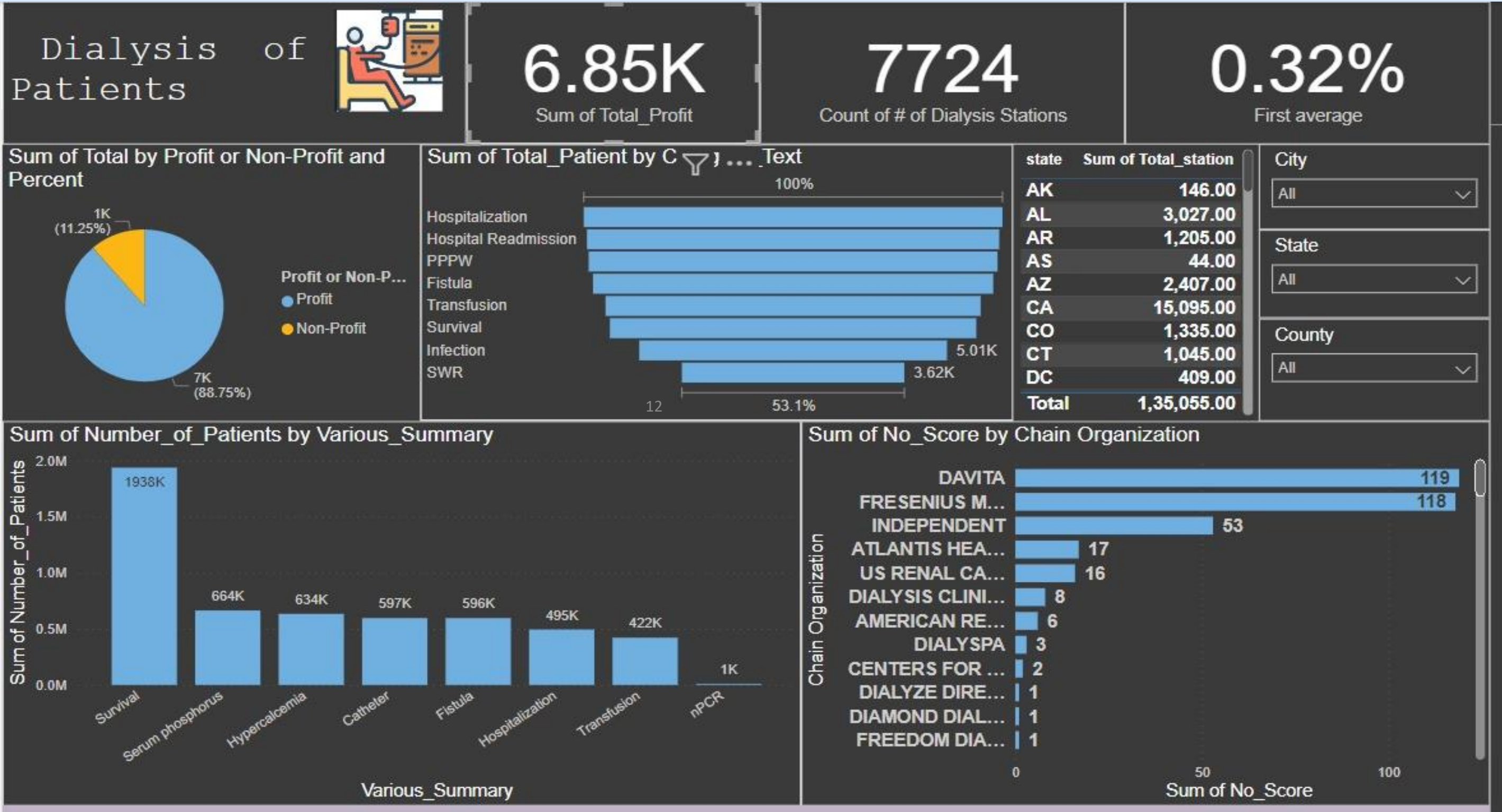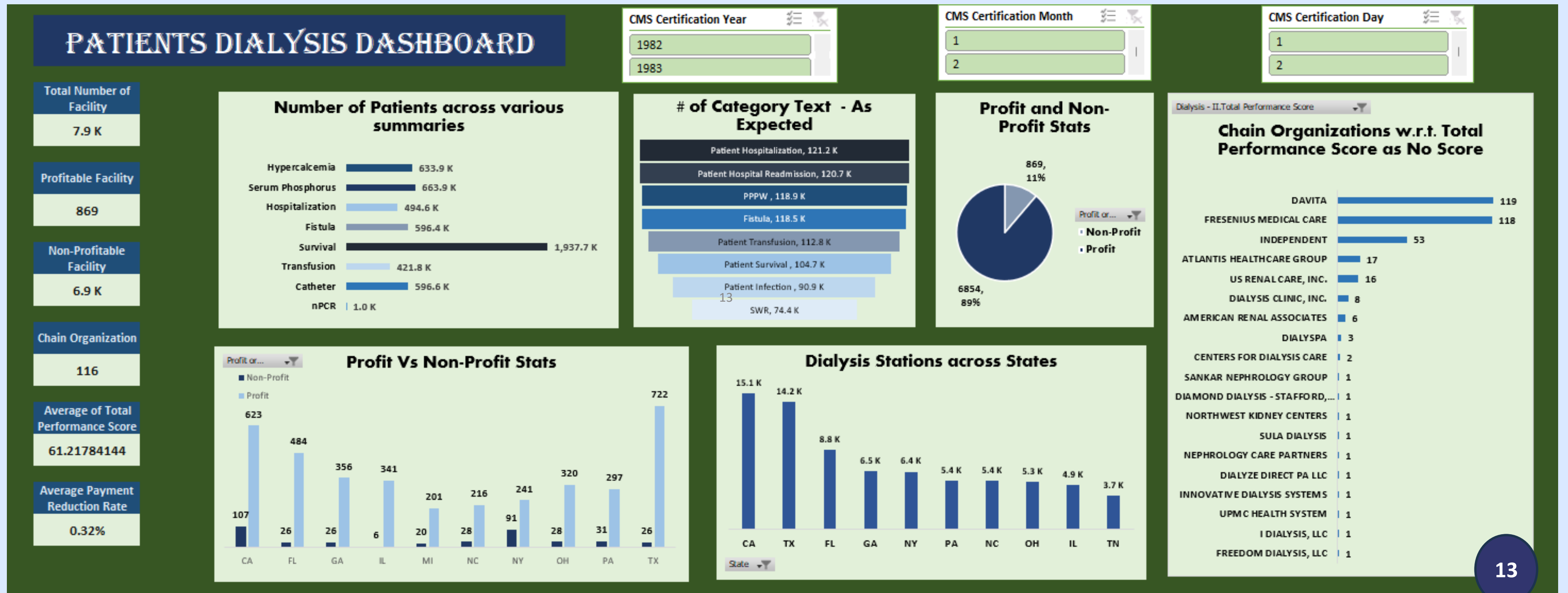0 — 50 — 100
Sum of No_Score

12

TABLEAU DASHBOARD

We connected SQL Server to Tableau, enabling direct data import for creating interactive visualizations. This integration enhances data analysis and interpretation through dynamic visual tools.

MYSQL QUERIES

Initially, we created a database in MySQL and used it to set up a table. The table's structure must align with the format of the CSV file. When defining column names, we also need to specify the data type for each column, such as VARCHAR for text or INT for integers. Once the table with the required columns is created, we can import the CSV file into MySQL using the wizard option provided in MySQL Workbench. This process ensures that the data is correctly mapped and inserted into the table.

Table structure

```
CREATE TABLE `dialysis1` (
    `Provider Number` text,
    `Network` text,
    `Facility Name` text,
    `Five Star Date` text,
    `Five Star` text,
    `Five Star Data Availability Code` text,
    `Address Line 1` text,
    `Address Line 2` text,
    `City` text,
    `State` text,
    `Zip` text,
    `County` text,
    `Phone Number` text,
    `Profit or Non-Profit` text,
    `Chain Owned` text,
    `Chain Organization` text,
    `# of Dialysis Stations` text,
    `Patient Transfusion category text` text,
    `Number of patients included in the transfusion summary` text,
    `Number of patients in hypercalcemia summary` text,
    `Number of patient-months in hypercalcemia summary` text,
    `Number of patients in Serum phosphorus summary` text,
    `Number of patient-months in Serum phosphorus summary` text,
    `Patient hospitalization category text` text,
    `Patient Hospital Readmission Category` text,
    `Patient Survival Category Text` text,
    `Number of patients included in hospitalization summary` text,
    `No of hospitalizations included in hospital readmission summary` text,
    `Number of Patients included in survival summary` text,
    `Patient Infection category text` text,
    `Fistula Category Text` text,
    `Number of Patients included in fistula summary` text,
    `Number of patients in long term catheter summary` text,
    `Number of patient months in long term catheter summary` text,
    `Number of patients in nPCR summary` text,
    `Number of patient-months in nPCR summary` text,
    `SWR category text` text,
    `PPPW category text` text
);
```

KPI 1

```
-- select * from project1.dialysis1 where `Number of patient-months in nPCR summary`='96';
drop table KPI1;
create table KPI1 as
(
select 'nPCR' as Various_Summary,
format(sum(`Number of patients in nPCR summary`),'0') as Number_of_Patients from project1.dialysis1
union
select 'Catheter' as Various_Summary,
format(sum(`Number of patients in long term catheter summary`),'0') as Number_of_Patients from project1.dialysis1
union
select 'Transfusion' as Various_Summary,
format(sum(`Number of patients included in the transfusion summary`),'0') as Number_of_Patients from project1.dialysis1
union
select 'Survival' as Various_Summary,
format(sum(`Number of Patients included in survival summary`),'0') as Number_of_Patients from project1.dialysis1
union
select 'Fistula' as Various_Summary,
format(sum(`Number of Patients included in fistula summary`),'0') as Number_of_Patients from project1.dialysis1
union
select 'Hospitalization' as Various_Summary,
format(sum(`Number of patients included in hospitalization summary`),'0') as Number_of_Patients from project1.dialysis1
union
select 'Serum phosphorus' as Various_Summary,
format(sum(`Number of patients in Serum phosphorus summary`),'0') as Number_of_Patients from project1.dialysis1
union
select 'Hypercalcemia' as Various_Summary,
format(sum(`Number of patients in hypercalcemia summary`),'0') as Number_of_Patients from project1.dialysis1
);
```

MYSQL QUERIES

```sql
create table KPI2_State_lvl as
(
select distinct state,
SUM(case when `Profit or Non-Profit`='Profit' then 1 else 0 end) as Total_Profit,
SUM(case when `Profit or Non-Profit`='Non-Profit' then 1 else 0 end) as Total_Non_Profit
from project1.dialysis1
where trim(`Profit or Non-Profit`) <> ''
group by State
);
```

KPI 2

```sql
create table KPI3 as
(
select `Chain Organization`,sum(case when `Total Performance Score`='No Score' then 1 else 0 end) as No_Score
from
dialysis2 a join dialysis1 b on a.`CMS Certification Number (CCN)` =b.`Provider Number`
group by `Chain Organization`
order by 2 desc
)
;
```

KPI 3

```sql
create table KPI4 as
(select state, sum(`# of Dialysis Stations`) as Total_station
from project1.dialysis1
group by state
);
```

KPI 4

```sql
create table KPI5 as
(select 'Transfusion' as Category_Text,
SUM(case when `Patient Transfusion category text` ='As Expected' then 1 else 0 end ) as Total_Patient
from project1.dialysis1
union
select 'Hospitalization' as Category_Text,
SUM(case when `Patient hospitalization category text` ='As Expected' then 1 else 0 end ) as Total_Patient
from project1.dialysis1
union
select 'Survival' as Category_Text,
SUM(case when `Patient Survival Category Text` ='As Expected' then 1 else 0 end ) as Total_Patient
from project1.dialysis1
union
select 'Infection' as Category_Text,
SUM(case when `Patient Infection category text` ='As Expected' then 1 else 0 end ) as Total_Patient_Transfusion
from project1.dialysis1
union
select 'Fistula' as Category_Text,
SUM(case when `Fistula Category Text` ='As Expected' then 1 else 0 end ) as Total_Patient_Transfusion
from project1.dialysis1
union
select 'PPPW' as Category_Text,
SUM(case when `PPPW category text` ='As Expected' then 1 else 0 end ) as Total_Patient_Transfusion
from project1.dialysis1
union
select 'Hospital Readmission' as Category_Text,
SUM(case when `Patient Hospital Readmission Category` ='As Expected' then 1 else 0 end ) as Total_Patient_Transfusion
from project1.dialysis1
);
```
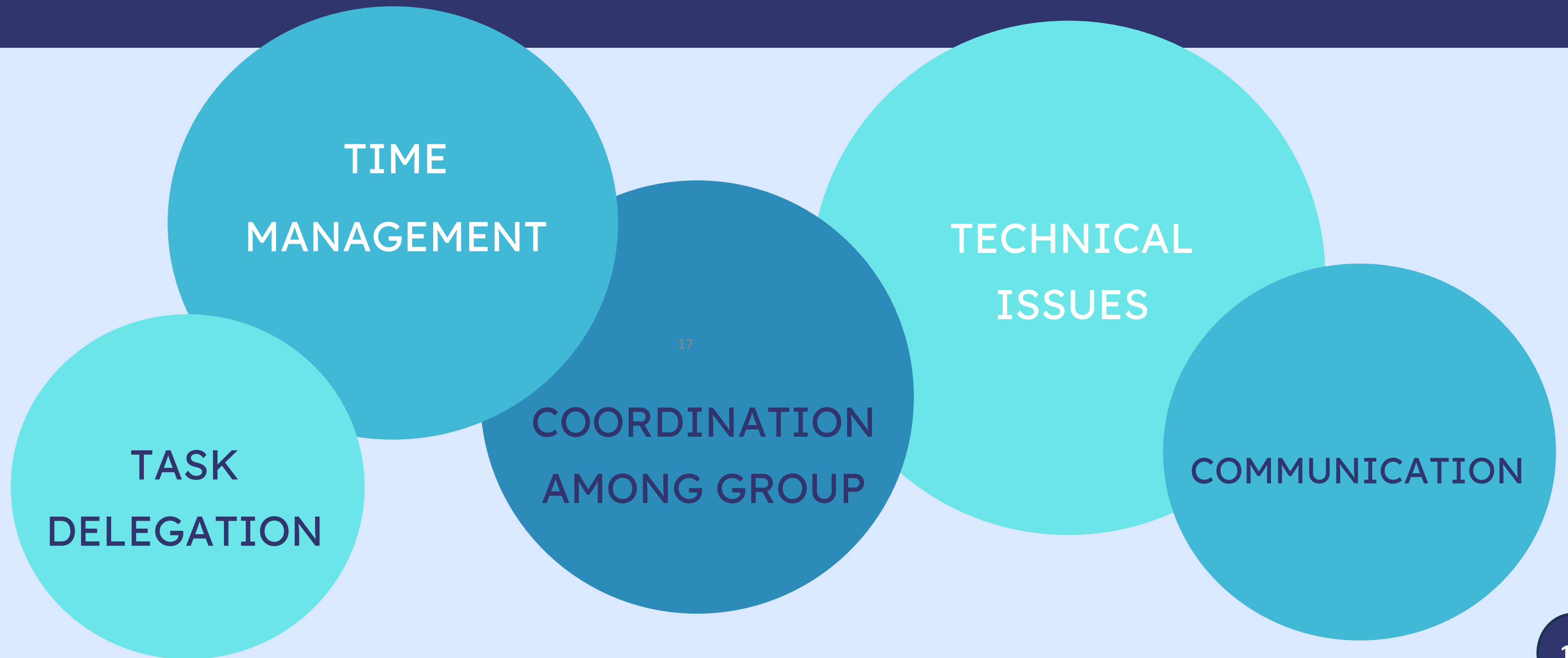
KPI 5

```sql
create table KPI_6 as (select concat(format(avg(`PY2020 Payment Reduction Percentage`),2),"%") as average from dialysis2);
```

KPI 6

15

CONCLUSION/INFERENCES

- The KPIs reveal a focus on survival and hospitalization, but high catheter use and transfusion rates suggest areas for care improvement.

- With the majority of facilities operating for-profit and performance scores concentrated in a few large providers, there is an opportunity to enhance service quality and reduce reliance on invasive procedures.

- The 0.32% average payment reduction rate indicates strong overall performance, but there is room to further optimize patient outcomes, particularly in reducing infections and improving hospital readmission rates.

- Increasing efficiency in these areas could lead to better patient care and financial outcomes.

- Focusing on reducing catheter use and enhancing fistula rates could significantly improve patient outcomes, further lowering the already modest payment reduction rate and driving higher quality care across all facilities.

CHALLENGES FACED DURING INTERNSHIP PERIOD

TIME MANAGEMENT

TECHNICAL ISSUES

17

TASK DELEGATION

COORDINATION AMONG GROUP

COMMUNICATION

16