Comparing Rising Healthcare Costs in New England and the American Midwest

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Driven to Discover℠

Introduction & Background

- **Analyst**:
  - **Name**: Danny Moncada
  - **Education**:
    - University of Connecticut, B.S. Business Technology, Class of 2008
    - M.S. Business Analytics Candidate, Class of 2020
  - **Occupation**: Data & Reporting Analyst, Office of Human Resources, University of Minnesota
- **Background**
  - Six plus years working in information technology and reporting roles for Cigna Healthcare
  - Relocated to Minneapolis in Fall 2017 to start school in 2018
  - Interest sparked by reviewing **Minnesota Health Care Spending: 2015 and 2016 Estimates and Ten-Year Projections**, developed by the *Minnesota Department of Health*

Data Engineering & Analysis

- **Languages**
  - SAS
  - Python
- **Data Engineering Tasks**
  - Aggregation
  - Filling of missing values
  - Interpolation
  - Merging
  - Slicing
  - Data type conversion
- **Output**
  - Jupyter notebook (for displaying visualizations)

```
Here are the environment details...

C:\Python\envs\MSBA2020\python.exe
3.7.1 (default, Oct 28 2018, 08:39:03) [MSC v.1912 64 bit (AMD64)]
sys.version_info(major=3, minor=7, micro=1, releaselevel='final', serial=0)

This notebook is using pandas version: 0.25.3.
This notebook is using numpy version: 1.16.4.
This notebook is using seaborn version: 0.9.0.
This notebook is using matplotlib version: 3.1.2.
```

** Example of data engineering performed using Python

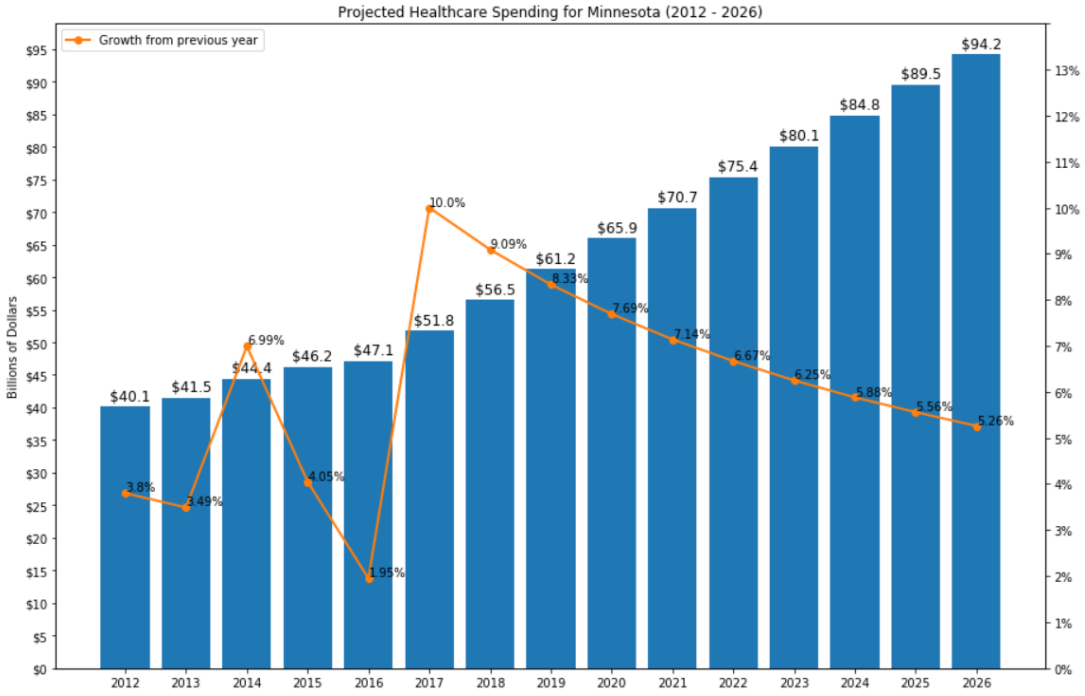
```
## One more step - we can calculate the rise of spending by using another helpful Python function
## to get the percent change from one year to the next

minnesota_healthcare_df["Growth"] = round(minnesota_healthcare_df["Spend (Billions of Dollars)"].pct_change() * 100, 2)

## We'll fill in the last empty value with the previous years' growth, which was available from the original article
minnesota_healthcare_df.fillna(3.8, inplace = True)
```

Rising Healthcare Costs in Minnesota (2012 - 2026)

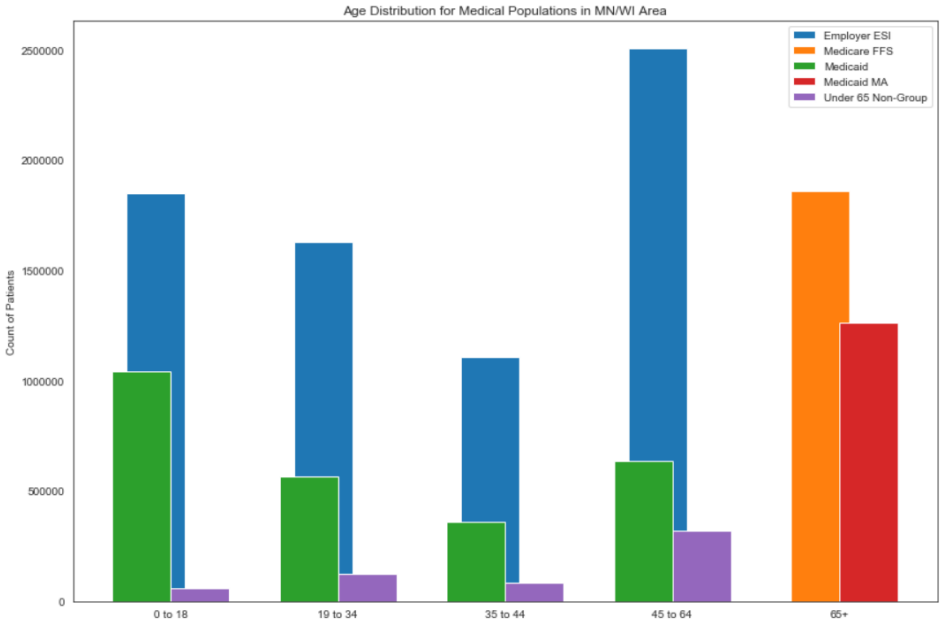
- Based on data available from an existing report from the Minnesota Department of Health, projected healthcare spending is expected to reach **$94.2** billion by 2026.
- At this rate, that means the growth from the previous year (how much spending grows year over year) will never drop below **5.26%**, and the next three years will see growth of **7.69%**, **7.14%**, and **6.67%** respectively.
- *With more of the medical population moving into retirement (as seen in the later analyses) and off of employer sponsored plans, will patients start to feel the additional burden related to rising healthcare costs?*



Source: Minnesota Health Care Spending: 2015 and 2016 Estimates and Ten-Year Projections, *Minnesota Department of Health*, February 2019

Age Distributions for Medical Populations in Minnesota & Wisconsin

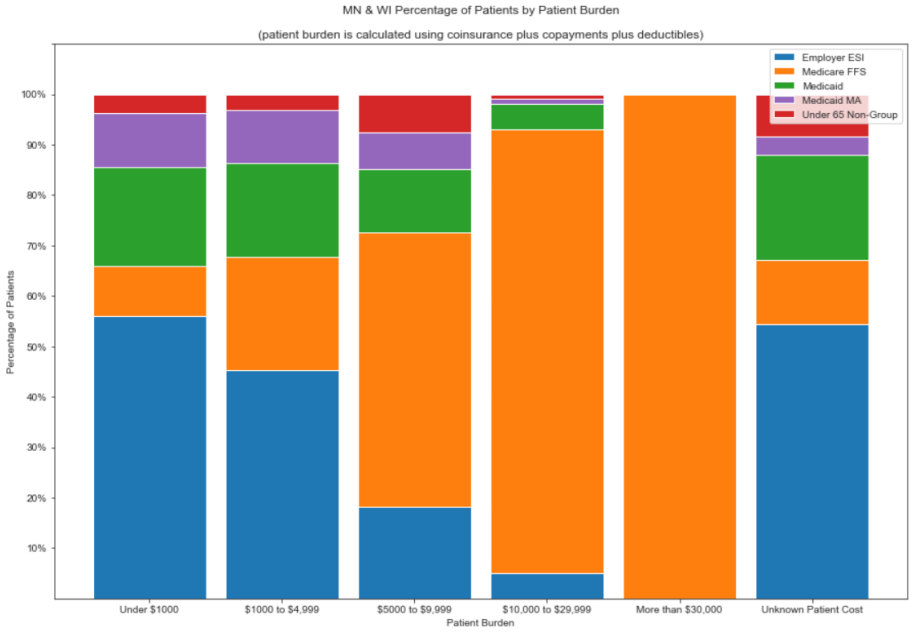
- There are ~3.46 million patients that belong in the **45 to 64** age range in Minnesota & Wisconsin; out of the entire medical population, that accounts for **~26%** of the entire medical population that was queried (total of ~13.4 million patients).
- The second largest group belongs to the **65 and older** age range; there are ~3.11 million patients, accounting for 23% of the entire medical population queried.
- *Simple math tells us that ~49% of the population is in or will be entering retirement age; how will these patients pay for the medical care they will need as they enter their twilight years?*



Source: SynUSA Synthetic Health Insurance Analytic File System (SHIAF), ***Stephen F. Parente***, December 2019

Patient Burden for Medical Populations in Minnesota & Wisconsin

- Patient burden is calculated by combining coinsurance, copayments, and deductibles; this is what patients were required to pay out-of-pocket for services rendered in 2015.
- 100% of claims where the out-of-pocket cost to the patient was **greater than $30,000** came from the *Medicare FFS* insurance group.
- ~90% of claims where the out-of-pocket cost to the patient was between **$10,000 to $30,000** came from the *Medicare FFS* insurance group.
- Tying this back to the previous analysis, more and more patients will be moving from the 45 to 64 age band into the 65 and older group; *will these patients be on the hook for greater out-of-pocket expenses?*



Source: SynUSA Synthetic Health Insurance Analytic File System (SHIAF), *Stephen F. Parente*, December 2019