SAS® GLOBAL FORUM 2016

IMAGINE. CREATE. INNOVATE.

Solving a Business Problem with SAS EG

Creating an Inpatient Census Model

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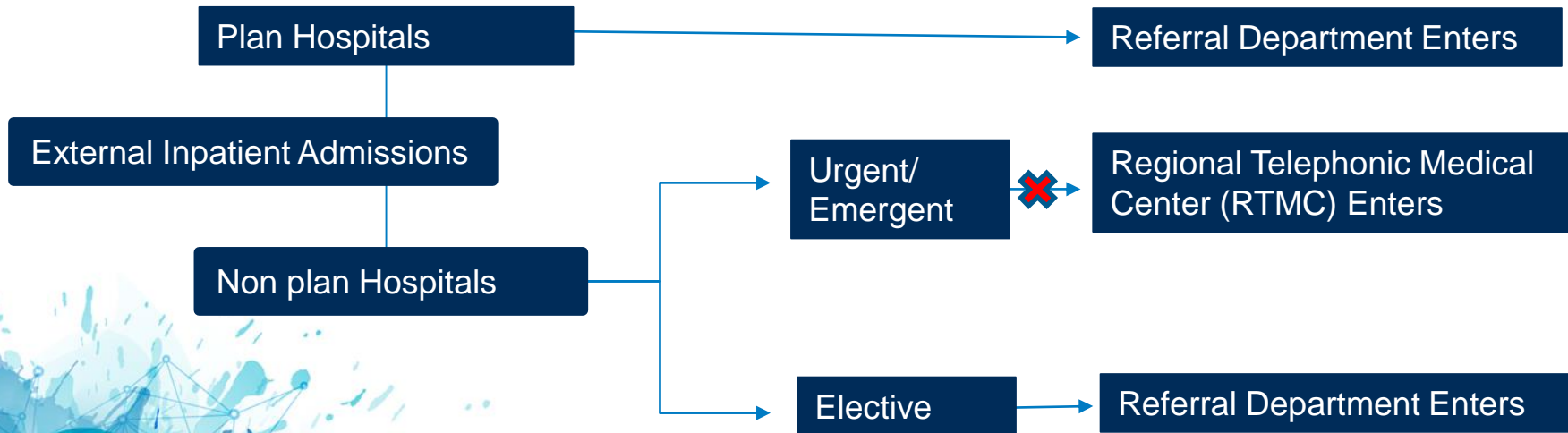Kaiser Permanente Northwest

#SASGF

About the presenter

Tom is responsible for Kaiser Permanente Northwest's regional Utilization Management analytics. He has over 11 years of experience in the data analytics field. Tom holds an MS in Applied Statistics from Penn State University.

What is an Inpatient Census Model? Why is it important?

- An estimate of our regional inpatient hospital utilization as of the prior midnight

- It is used to develop analytics and forecasts that are essential to the decision making of Kaiser Permanente leaders

- Knowing where our members are is essential to the organization from a quality and cost perspective

- The final product, the basis for much of our utilization reporting, analysis, and forecasting, is a database table at the patient and day level (there is one record for each patient for each day spent in the hospital)
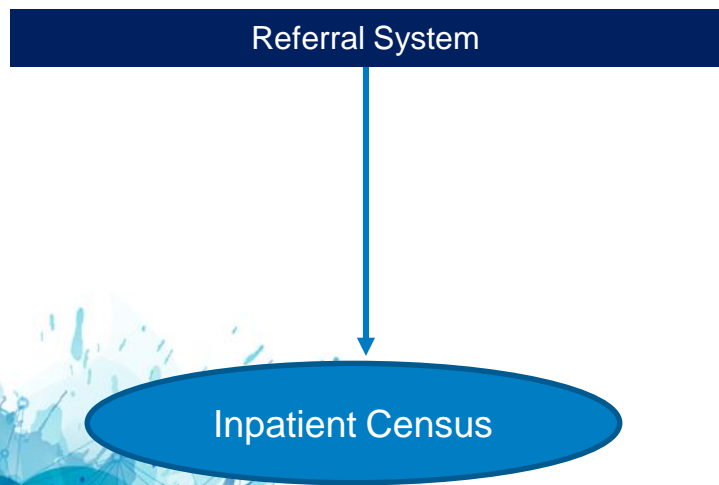
Why was a new model needed?

- A business policy change resulted in the loss of our ability to track current urgent and emergent inpatient admissions at external, non plan hospitals through our referral system:
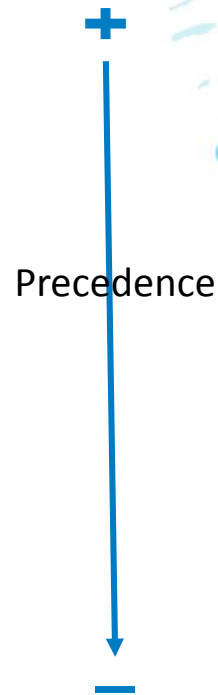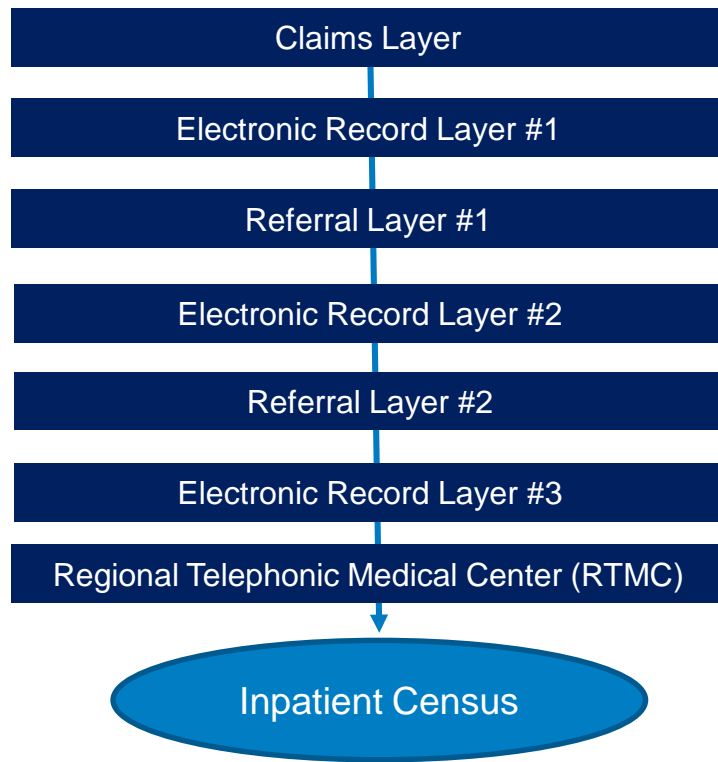
| Plan Hospitals | → | Referral Department Enters |

| External Inpatient Admissions |

| Non plan Hospitals | → | Urgent/Emergent | ✖→ | Regional Telephonic Medical Center (RTMC) Enters |
| | → | Elective | → | Referral Department Enters |

Increased Complexity & Multiple Inpatient Sources

Old Model Source

Referral System

Inpatient Census

New Model Sources

Claims Layer

Electronic Record Layer #1

Referral Layer #1

Electronic Record Layer #2

Referral Layer #2

Electronic Record Layer #3

Regional Telephonic Medical Center (RTMC)

Inpatient Census

+

Precedence

–

Inpatient admits are matched between layers to check for duplicates, and those admits in a higher layer take precedence over any duplicate in a lower layer

Why SAS Enterprise Guide?

- connect to multiple data sources/environments within the same project

- import data from different sources and export data to different destinations

- easily combine and compare multiple data sets with different field names, formats, and values representing the same metric

- Individual/common login .sas files to aid in accessing multiple environments

- simple date macros with flexible formatting options

- create new tables/variables, join/sort/group datasets, and use conditional clauses all in one step with Proc SQL

- SAS Data Step to logically format new variables and union multiple data sets

- multiple scheduling options (within SAS EG, SAS Management Console)

- efficient coding to map and standardize field values from multiple sources (proc format)

electronic record claims referrals telephonic medical center

SAS EG

Inpatient Census
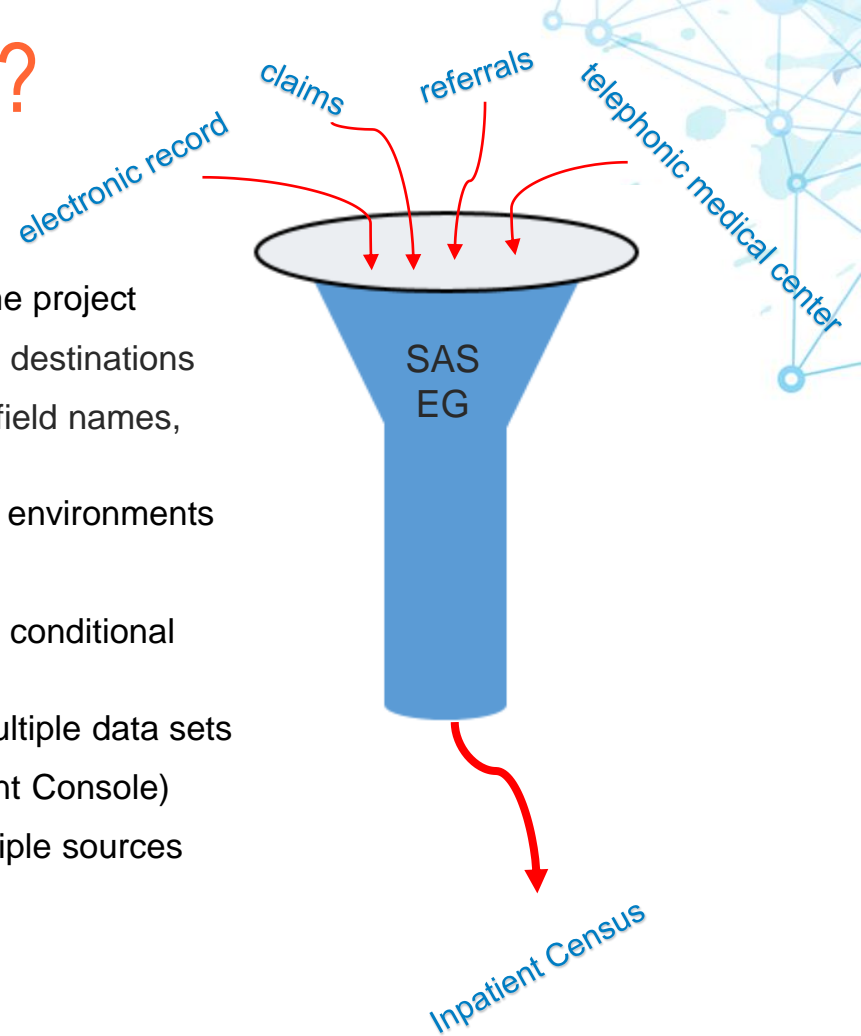
Results

- Old model understated our previous month's external inpatient utilization by an average of 10%

- New model has shown an overstatement of 0% to 3%, an improvement in accuracy over the old model

- More confidence in estimates of incurred but not reported (IBNR) claims

- Complexity of the new model has led to a standardization across the Northwest region of methodology in analyzing external hospital inpatient metrics

- Short term forecasts of future inpatient utilization and costs have proved more accurate

- Infrastructure exists to allow new data sources to be easily incorporated into the model as additional layers (ex. Emergency Department Information Exchange)