



# CALIFORNIA'S EFFORTS TO REACH AUTOMATED VISUAL EDITING



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## BACKGROUND

Visual editing is defined in the state of California as a text to code quality control review of an abstract after it has been uploaded into the Eureka database software. Over the years California has made a slow transition away from 100% Visual Editing that was in place when Eureka database software was first deployed to the current 5% that is performed, which began in 2015. As California's case load has continued to increase exponentially, previous years' expectations to perform Visual Editing has become no longer possible. A gap has been created between the reduction in manual quality control efforts and data quality. The driving force for the California Cancer Reporting and Epidemiologic Surveillance (CalCARES) Program to implement complex automation logic to improve data quality has been to bridge this gap at the central registry.

## OBJECTIVE

CalCARES has implemented automated logic that individually run throughout the different processing levels in Eureka:

### Source Logic

Runs on all levels of Eureka to correct identified data fields based on national coding rules in admissions, modified records, and consolidated data.

#### Implemented:

- Race 1-5
- Comorbid Complication 1-10

### Edit to Auto-Change Rules

Runs at all levels in Eureka to auto correct edit errors in admissions, modified records, and consolidated data. This automation is limited to edits that have a many to one correction.

#### Implemented:

- IF467 Surgery, Reason for No Surg
- IF619 Sex, Primary Site
- IF631 RX Summ--Chemo, RX Hosp--Chemo
- IF632 RX Summ--Hormone, RX Hosp--Hormone
- IF633 RX Summ--BRM, RX Hosp--BRM
- IF634 RX Hosp--Other, RX Summ--Other
- IF672 RX Summ--DX Stg Proc, RX Hosp--DX Stg Hosp
- IF697 Comorbid/Complication 1, Source Comorbidity
- IF836 RX Date--Transplnt Endocr, Date Flag
- IF850 CS Mets at DX--Bone, CS Mets at DX
- IF852 CS Mets at DX--Brain, CS Mets at DX
- IF875 CS Mets at DX--Liver, CS Mets at DX
- IF879 Date Surg Proc 3, Date Flag
- IF881 Date Surg Proc 2, Date Flag
- IF883 Date Surg Proc 1, Date Flag
- IF884 CS SSF 6, RX Summ--Surg, ColoRectal
- IF885 CS Mets at DX--Lung, CS Mets at DX
- IF894 Date of 1st Contact, Date Flag
- IF895 Date of Birth, Date Flag
- IF897 Date of Diagnosis, Date Flag
- IF904 Date of Inpt Adm, Date Flag
- IF905 Date of Inpt Disch, Date Flag
- IF918 RX Date BRM, Date Flag
- IF919 RX Date Chemo, Date Flag
- IF920 RX Date DX/Stg Proc, Date Flag
- IF921 RX Date--Hormone, Date Flag
- IF922 RX Date Mst Defn Srg, Date Flag
- IF923 RX Date Other, Date Flag
- IF924 RX Date Radiation, Date Flag
- IF925 RX Date Surgery, Date Flag
- IF926 RX Date Systemic, Date Flag

### Class of Case Rules

Runs on all levels in Eureka to correct Class of Case based on internally defined coding rules in admissions, modified records, and consolidated data.

#### Implemented:

- Class 00
- Class 38
- Class 34
- Class 36
- Class 43
- Class 49

#### Developed:

- Class 20

### Tumor Linkage Rules

Runs on upload to link incoming admissions and pathology reports to existing data in Eureka following the SEER Multiple Primary and Histology Coding Rules.

#### Implemented:

- Exact Match
- Colon
- Lung
- Prostate
- Breast
- Kidney
- Head and Neck
- Benign Brain
- Cutaneous Melanoma
- Malignant Brain
- Urinary
- Thyroid
- Stomach
- Pancreas
- Cervix
- Ovary
- Rectum
- Endometrium
- Negative Match

### Multi-Document Consolidation

Runs during the consolidation process or when an associated admission is revised to update consolidated data.

#### Implemented:

- Race 1-5
- Comorbid Complications 1-10

#### Developed:

- Pathologic and Clinical TNM fields
- Fields related to Active Follow-up

Each piece identified above is a work-in-progress and through analysis will be expanded. The goal is to develop Source Logic and Multi-Document Consolidation logic for each NAACCR field in the record layout. The TNM edits implemented as part of the 2016 Data Item Changes will be the next focus for the Edit to Auto-Change rules. The Tumor Linkage rules will also be expanded with introduction of the 2017 SEER Multiple Primaries and Histology Rules. All of this logic works towards expanding the visual editing process to be fully automated and allow for successful updates all active data in Eureka.

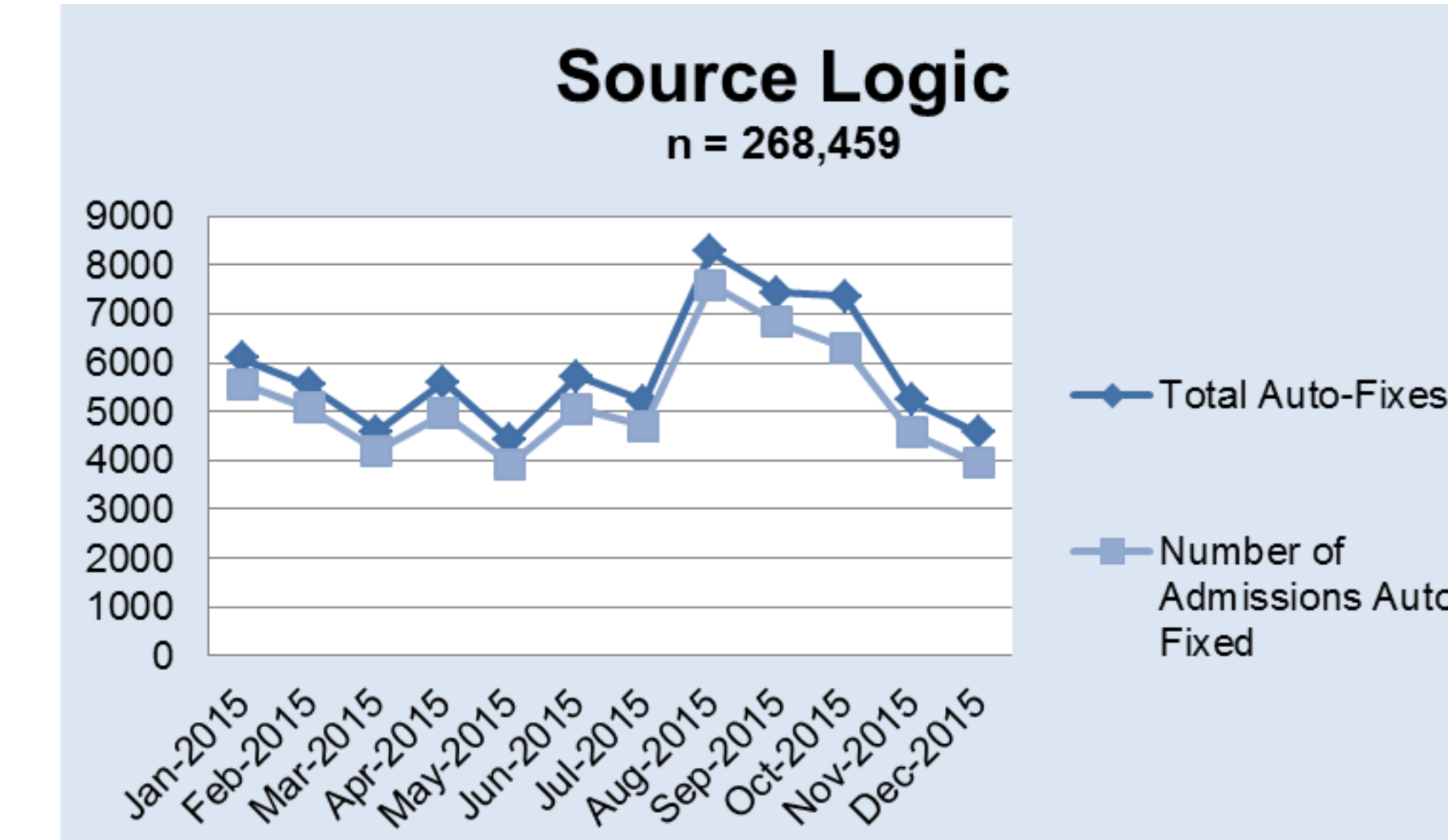
## METHODOLOGY

The manual visual editing process is greatly affected by grey areas in interpreting standards, which, leads to potential inconsistencies amongst Certified Tumor Registrars (CTRs) performing the task. One single data item review can have several different results when performed by different CTRs. Automation logic removes this inconsistency and provides a reliable way to document how and why decisions are made in the database. All automation logic goes through an intensive analysis process, which includes vetting by research staff to ensure results of logic meet all business requirements. After implementation, extensive post-implementation analysis is performed to ensure logic continues to work as intended. We are also able to track the number of Admissions that are affected by the different forms of automation logic. This tracking allows for us to verify the continued success and the overall impact of the logic on California data.

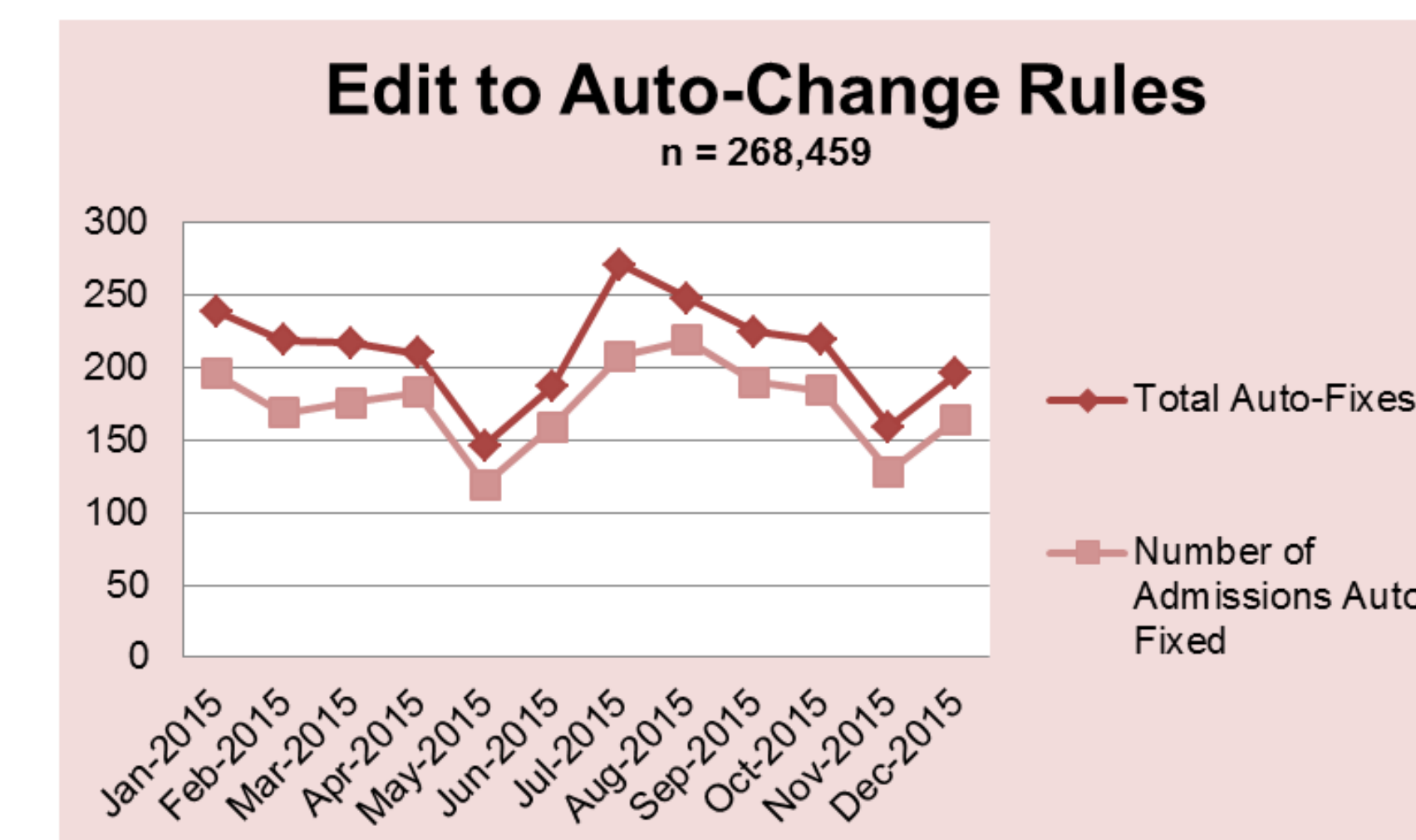


\*The CalCARES Program partners with the California Department of Public Health (CDPH) to manage the operations of the state mandated California Cancer Registry program

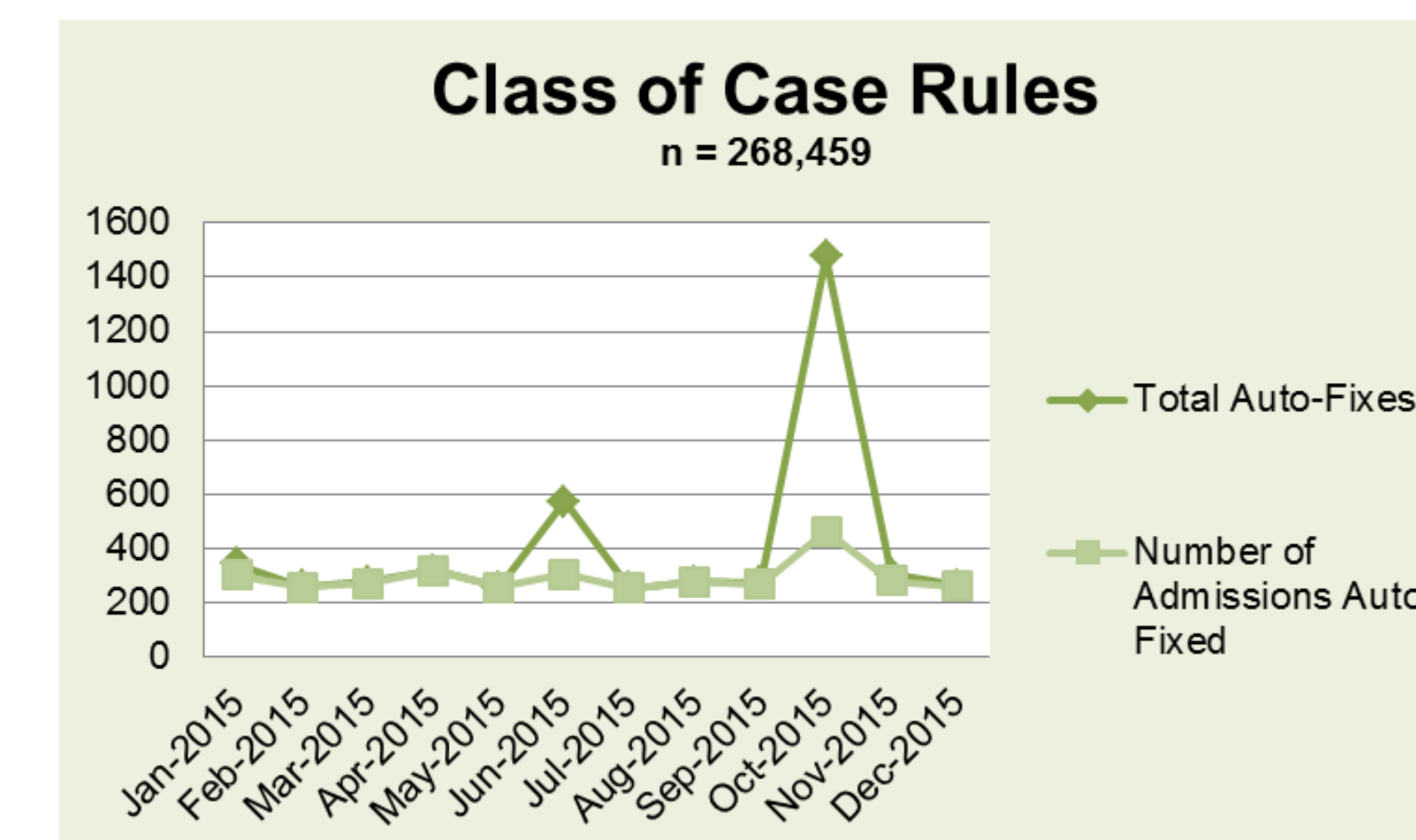
## OVERALL



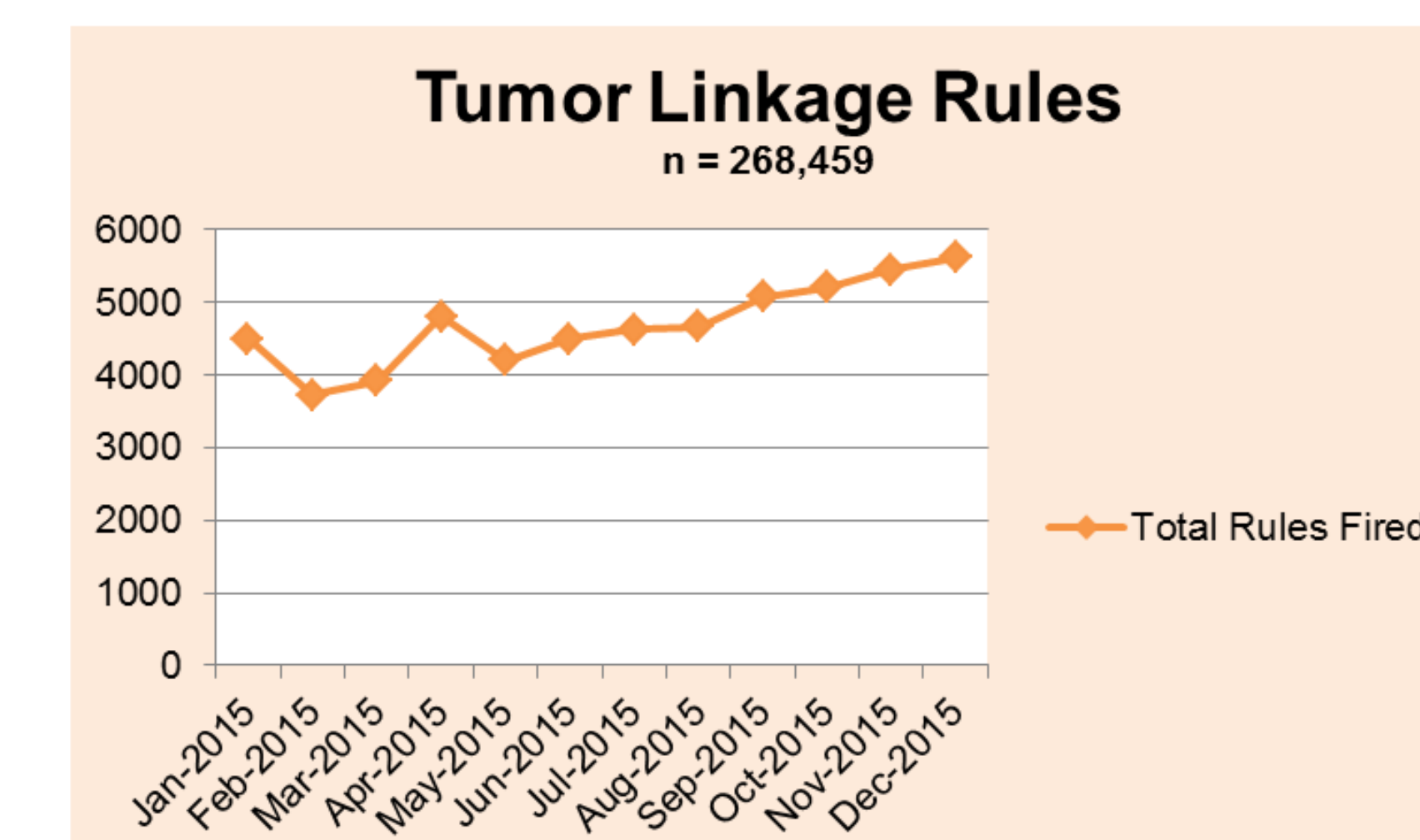
Source Logic runs on each Admission uploaded into Eureka, which was a total of 268,459 in 2015. 62,756 Admissions were auto-fixed with a total of 70,073 auto-fixes. 23% of uploaded Admissions were auto-corrected with the Source Logic.



Edit to Auto-Change Rules run on each Admission uploaded into Eureka, which was a total of 268,459 in 2015. 2,095 Admissions were auto-fixed with a total of 2,536 auto-fixes. 1% of uploaded Admissions were auto-corrected with the Edit to Auto-Change Rules.



Class of Case Rules run on each Admission uploaded into Eureka, which was a total of 268,459 in 2015. 3,534 Admissions were auto-fixed with a total of 4,901 auto-fixes. 1% of uploaded Admissions were auto-corrected with the Class of Case Rules.



Tumor Linkage Rules run on each Admission uploaded into Eureka, which was a total of 268,459 in 2015. 56,256 Rules fired on the uploaded Admissions. 21% of uploaded Admissions had the rules successfully fire on them.

With the 2016 Data Changes release of Eureka, tracking of Multi-Document Consolidation logic will be enhanced to allow for detailed review.

## CONCLUSION

Automation logic is able to run on 100% of Admissions uploaded into Eureka, compared to the 5% of Visual Editing performed, which shows the stark advantage of automation in quality control activities. The current business practice is missing the focus of adapting current manual work activities to meet future needs. Manual quality control efforts need to be advanced and adapted to meet where the field is going. Instead of targeting a small percentage of cases on upload, the task can be moved to an auditing process after completion. This transition allows for those performing quality control reviews to not only increase their analytic skillset, but also perform a focused review of targeted areas. This transition removes the high level of potential interpretation inconsistencies through a three phase process:

1. Extensive analysis of current standards and data quality in Eureka.
2. Implement complex automation logic that meets the business and data quality needs.
3. Post-implementation to ensure successful application of automation logic.