

# Creating Tools to Help a Specialty in Transition Meet the Future

A close-up, low-angle shot of a stack of medical instruments, likely stethoscopes, arranged diagonally across the frame. The brand name 'CRAFTSMAN' is embossed on the dark, textured handles of the instruments. The lighting is dramatic, with strong highlights and shadows, creating a professional and focused atmosphere.

**Kurtis Pivert**  
Data Science Officer  
American Society of Nephrology

Image: CC by 2.0 <https://bit.ly/2qUgCgN>

# **Disclosures**

**Employee**

American Society of Nephrology

**Direct Stock Ownership**

Apple, Inc.

BP, Inc.

Delta Airlines

New York Times, Inc.

**ASN**  **DATA**

The logo for ASN DATA features the acronym "ASN" in a large, bold, magenta sans-serif font. To its right is the word "DATA" in a larger, blue sans-serif font. Between the two words is a graphic element consisting of a grid of binary digits (0s and 1s) in blue, arranged in a pattern that suggests a digital or data-oriented theme.



- Motivation



# Motivation

# Open Source Tools

- **Motivation**
- **Open Source Tools**
- **Data-Driven Insights**

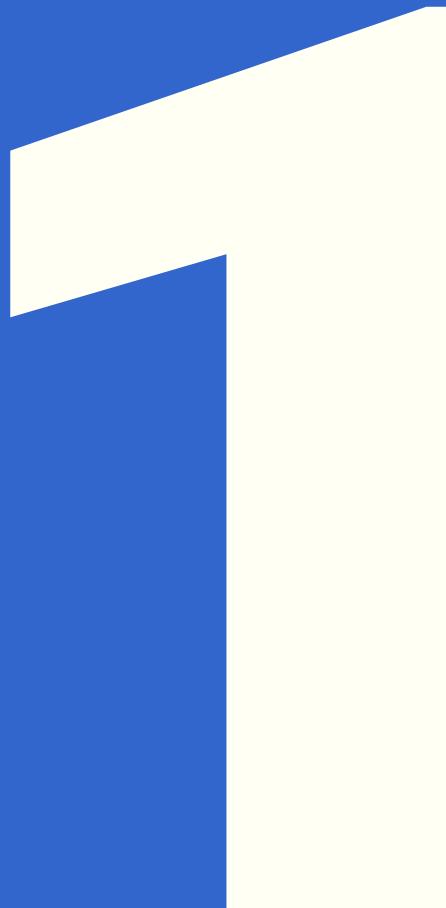
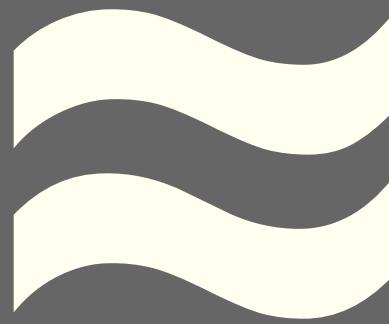
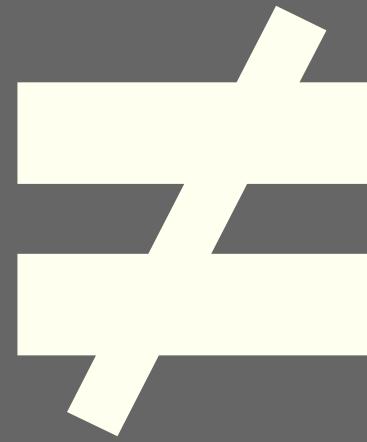
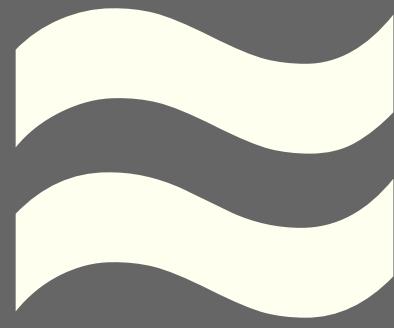




Image: CC by 2.0 <https://bit.ly/2I1wyV2>







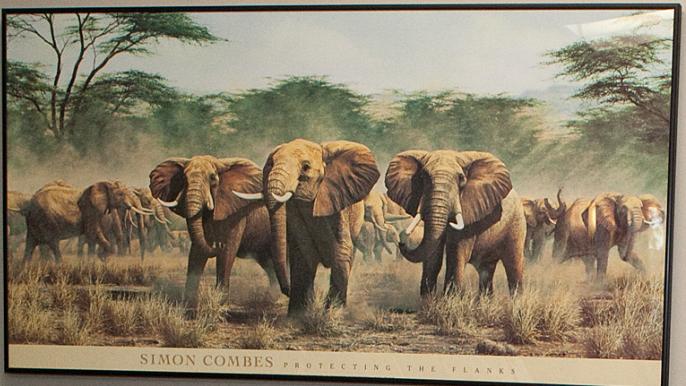
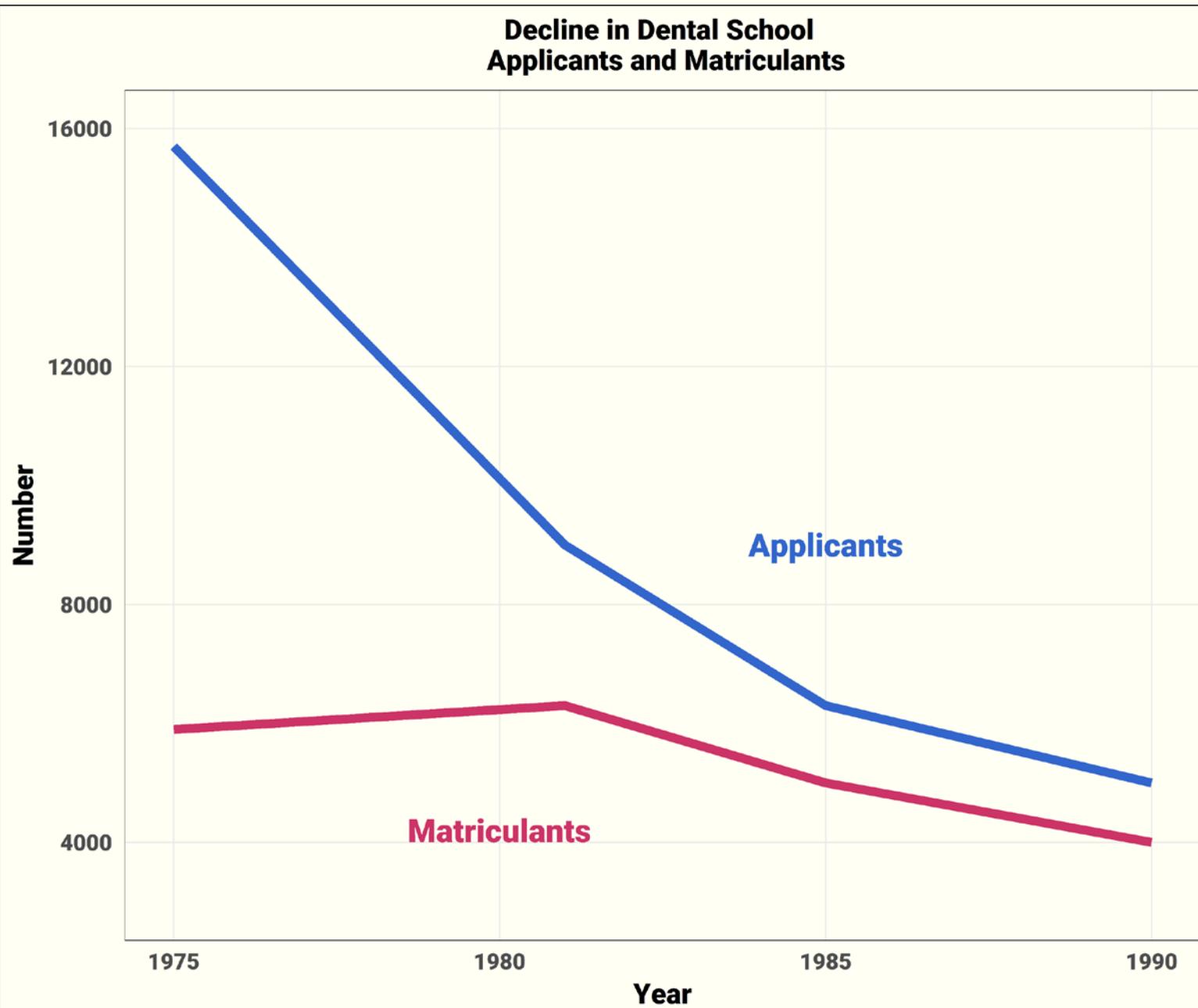


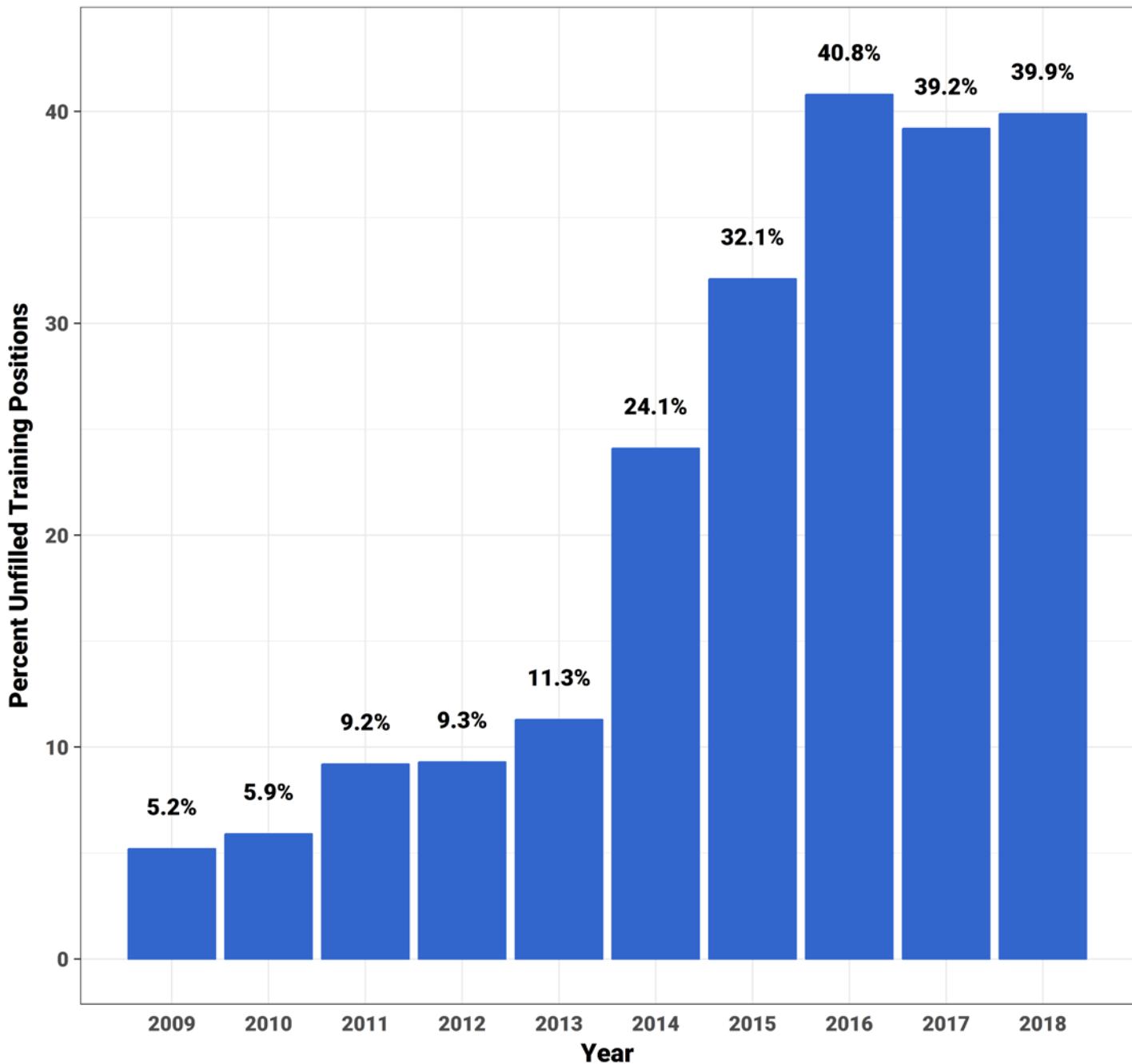
Image: CC by 2.0 <https://bit.ly/2FQTzIz>

# Dental Professional Training Experience

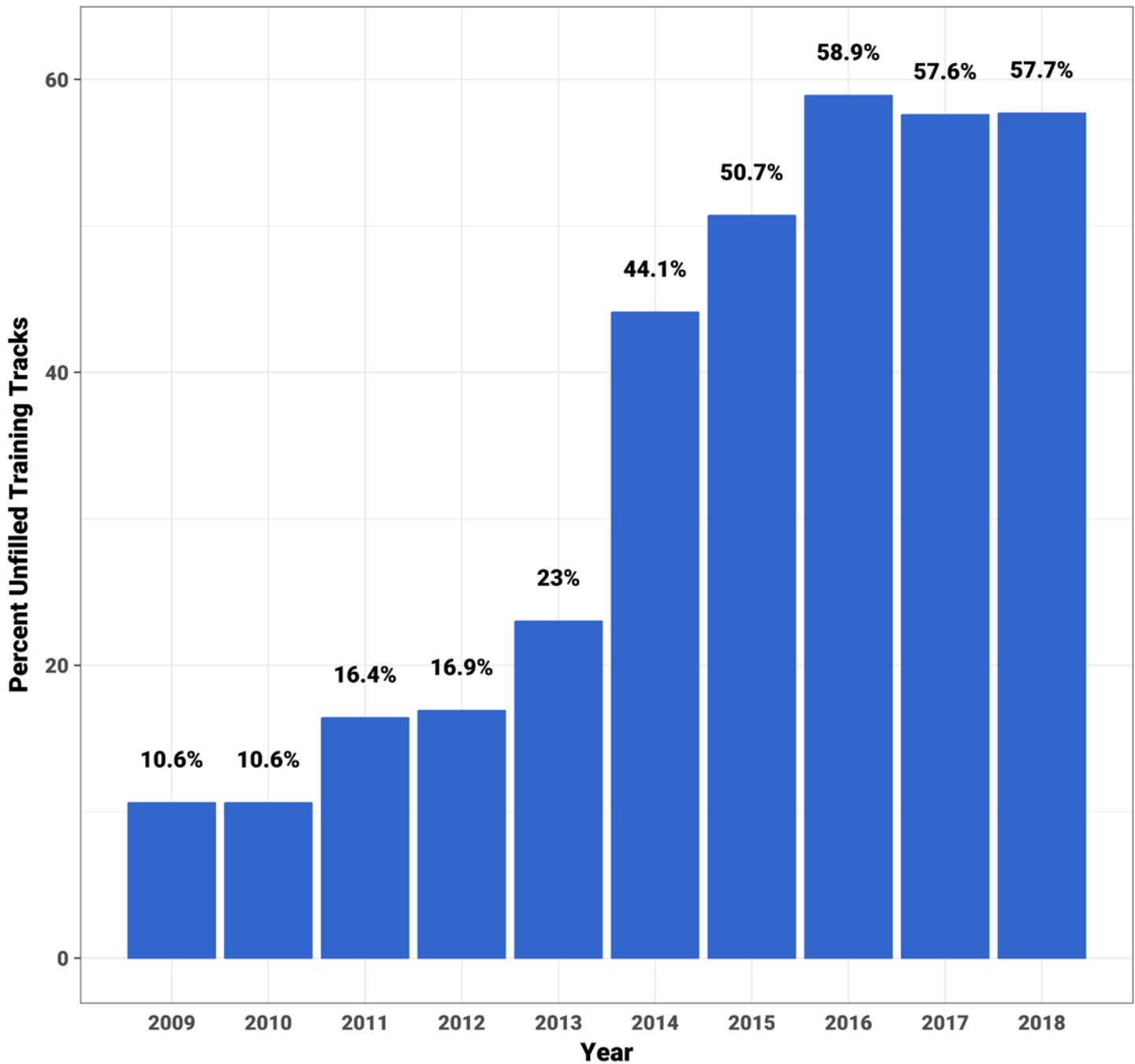


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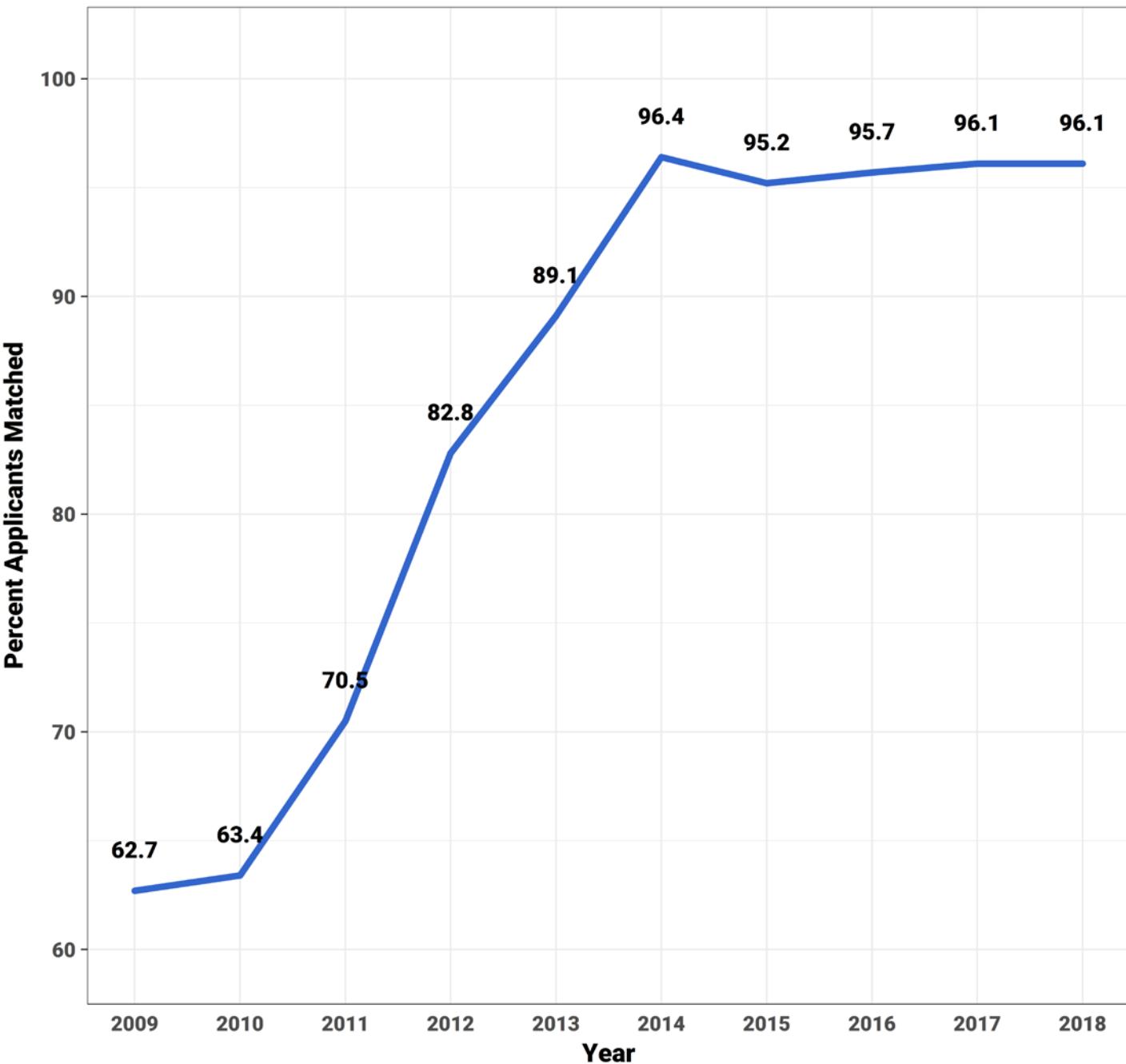
## Percentage of Unfilled Nephrology Positions: AY 2009 to AY 2018



## Percentage of Unfilled Nephrology Tracks: AY 2009 to AY 2018



## Percentage of Applicants Preferring Nephrology Matched: AY 2009 to AY 2018



# Kidney Diseases: Burden

## Chronic Diseases and Conditions with High Prevalence in the United States

Rank	Diseases and conditions	Percentage of adults (18 and over) with condition
1	Obesity	36.5
2	Hypertension	31.3
3	Chronic joint symptoms	28.7
4	Untreated dental caries	25.5
5	Arthritis	22.5
6	Chronic Kidney Disease	16.9

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# Kidney Diseases: Burden

## Diseases and Conditions with High Mortality in the United States in 2014

Rank	Diseases and conditions	Number of deaths
1	<b>Diseases of heart (heart disease)</b>	<b>614,348</b>
2	<b>Malignant neoplasms (cancers)</b>	<b>591,699</b>
3	<b>Chronic lower respiratory diseases</b>	<b>147,101</b>
4	<b>Accidents (unintentional injuries)</b>	<b>136,053</b>
5	<b>Cerebrovascular diseases (stroke)</b>	<b>133,103</b>
6	<b>Alzheimer's disease</b>	<b>93,541</b>
7	<b>Diabetes mellitus (diabetes)</b>	<b>76,488</b>
8	<b>Influenza and pneumonia</b>	<b>55,227</b>
9	<b>Nephritis, nephrotic syndrome and nephrosis (kidney disease)</b>	<b>48,146</b>
	<b>Renal failure</b>	<b>47,364</b>
10	<b>Intentional self-harm (suicide)</b>	<b>42,773</b>

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# **Kidney Diseases: Economic Burden**

## **Medicare Costs for Kidney Failure**

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**\$32.8 Billion**

# **Kidney Diseases: Economic Burden**

## **Medicare Costs for Kidney Failure**

**\$32.8 Billion**

**6% of CMS Budget**

1

2

# **Identifying Data Gaps**

## **Pipeline**

# **Identifying Data Gaps**

**Pipeline**

**Fellows in Training**

# **Identifying Data Gaps**

## Pipeline

## Fellows in Training

## Nephrology Training Programs

# Data Collection

**NRMP**

# Data Collection

NRMP

**ASN Nephrology GME Census**

# **Data Collection**

**NRMP**

**ASN Nephrology GME Census**

**SurveyMonkey**

# **Data Management**

## **Disparate sources**

# **Data Management**

**Disparate sources**

**MySQL**

# Data Management

Disparate sources

MySQL

Cloud

# Data Analysis

R

# Data Analysis

R

RStudio

# Data Analysis

R

RStudio

MySQL Interface

# Live Code Demo

# Live Code Demo

**2017 ASN Nephrology GME Census**

**Adult Nephrology Training Program**

\* 2. Please select your Adult Nephrology Training Program

\* 3. In the recently completed 2016–2017 academic year, how many fellows in training were at your institution? (Please provide a response for each fellowship year, including 0.)

1st Year (PGY-4)

2nd Year (PGY-5)

3rd Year (PGY-6)

Number of Fellows



\* 4. For the 2017–2018 academic year starting July 1, how many fellows in training are at your institution? (Please provide a response for each fellowship year, including 0.)

*Responses to 1st-year fellows only will be shared with NRMP.*

1st Year (PGY-4)

2nd Year (PGY-5)

3rd Year (PGY-6)

Number of Fellows



5. What additional fellowships does your program offer? (Select all that apply)

Interventional Nephrology

Transplant Nephrology

Critical Care Nephrology

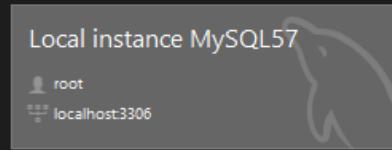
Research

Dual Meds/Peds Nephrology

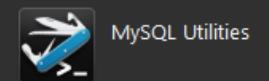




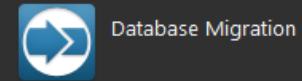
## MySQL Connections



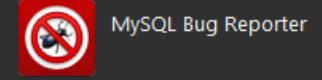
## Shortcuts



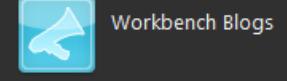
MySQL Utilities



Database Migration



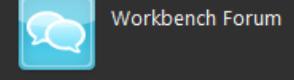
MySQL Bug Reporter



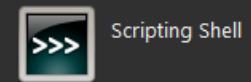
Workbench Blogs



Planet MySQL



Workbench Forum



Scripting Shell

MySQL Workbench

nephrology\_gme

File Edit View Query Database Server Tools Scripting Help

Navigator

SCHEMAS

Filter objects

nephrology\_gme

Tables

- acgme
- add\_train
- apd
- coordinator
- gmecurr
- gmeprev
- nrmp
- program
- tpd

Views

Stored Procedures

Functions

Management Schemas

Information

No object selected

2018-05-07\_AAMC-Sample-SQL

Limit to 1000 rows

```
1 •
2
3
4
5
6
SELECT
    SUM(acgme_approved_pos) AS totalPositions
FROM
    (acgme)
WHERE
    acgme_acad_year = 2016;
```

Result Grid

Filter Rows: Export: Wrap Cell Content:

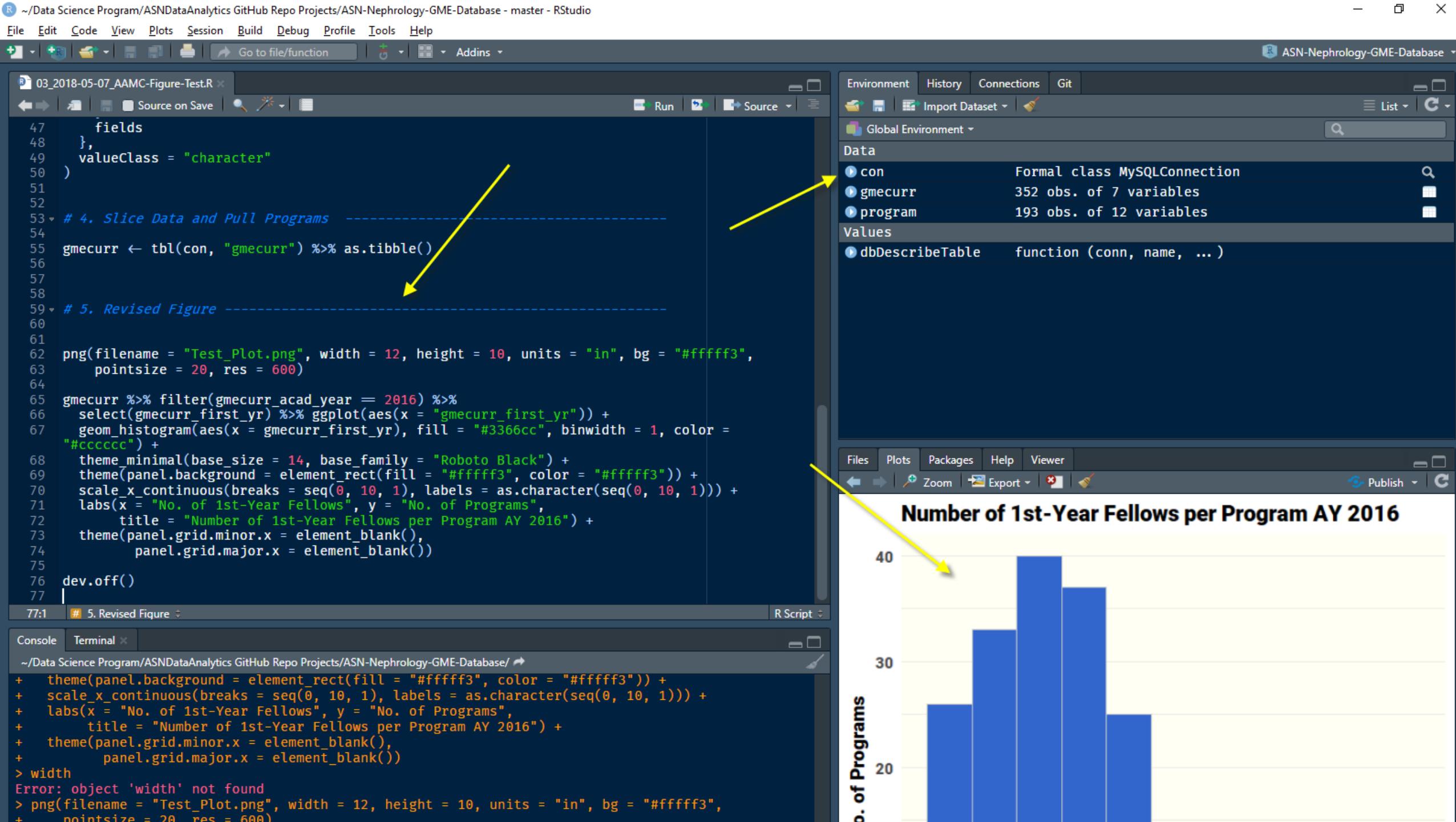
totalPositions
1223

Form Editor

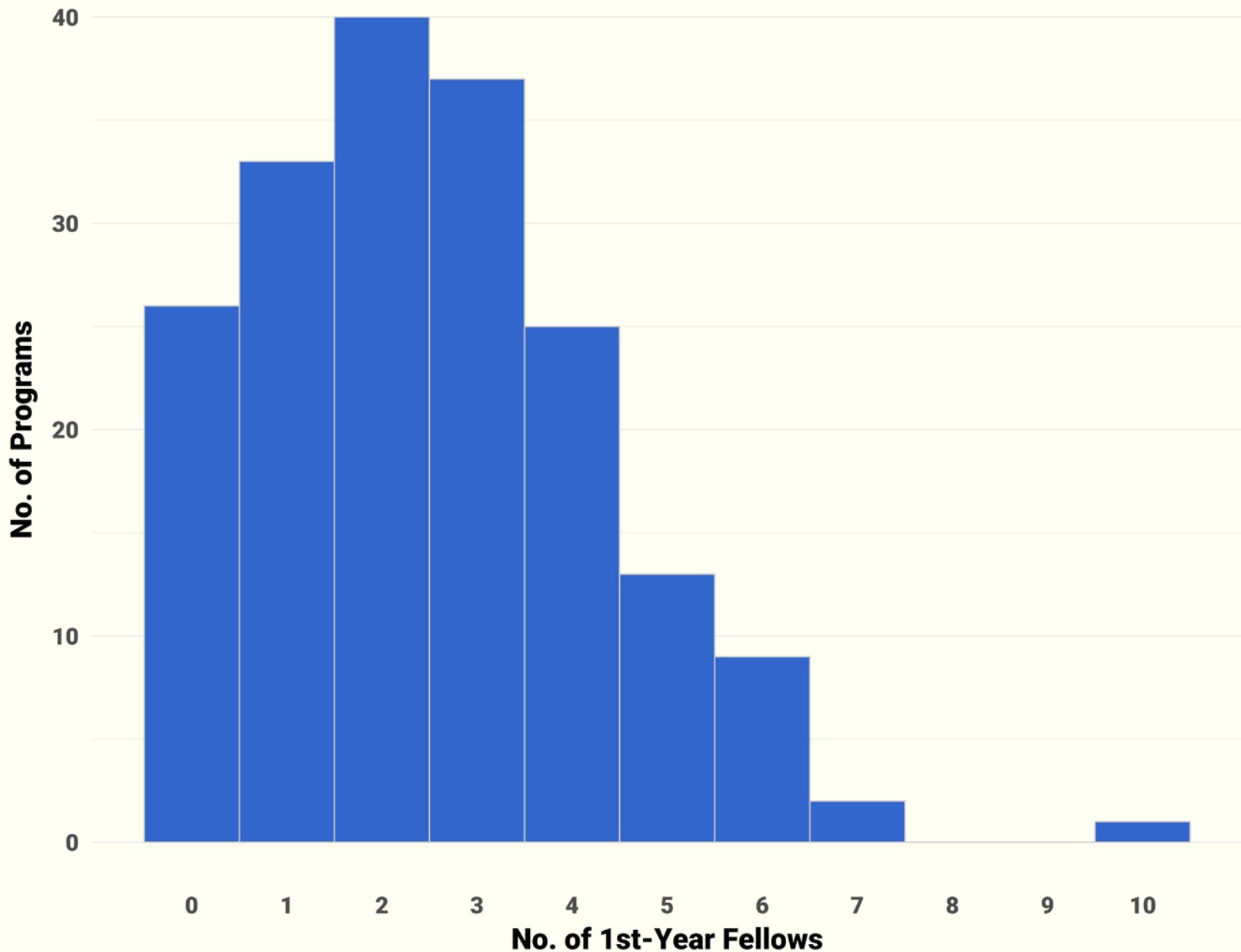
Field Types

Query Stats

The screenshot illustrates the execution of a SQL query within MySQL Workbench. The query calculates the sum of approved positions for the year 2016. The results are displayed in a grid, showing a single row with one column labeled 'totalPositions' containing the value '1223'. Red arrows highlight specific parts of the interface: one arrow points from the 'acgme' table in the Navigator to the WHERE clause in the SQL editor, and another arrow points from the 'totalPositions' column in the Result Grid to its value.



## Number of 1st-Year Fellows per Program AY 2016

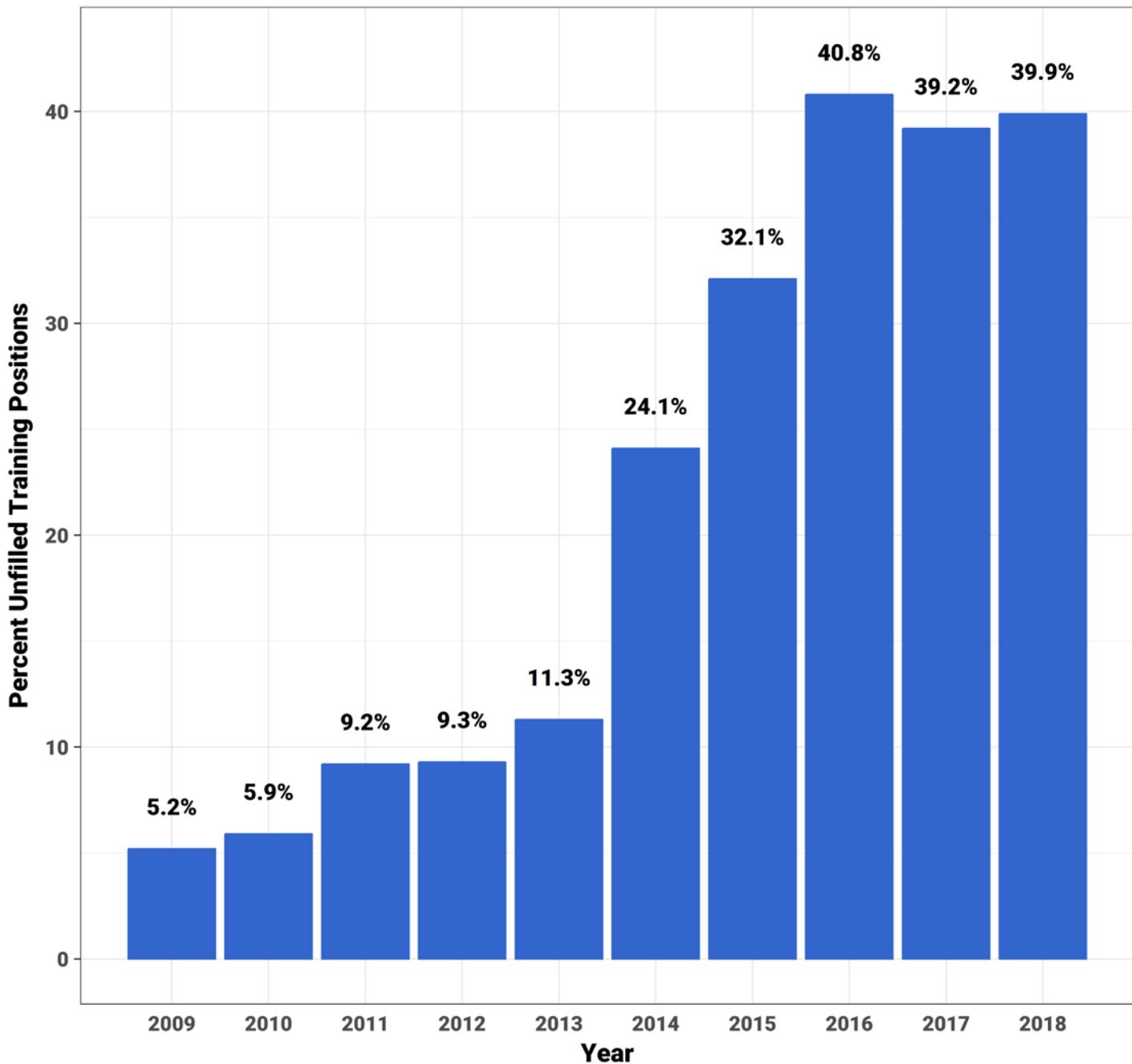


1

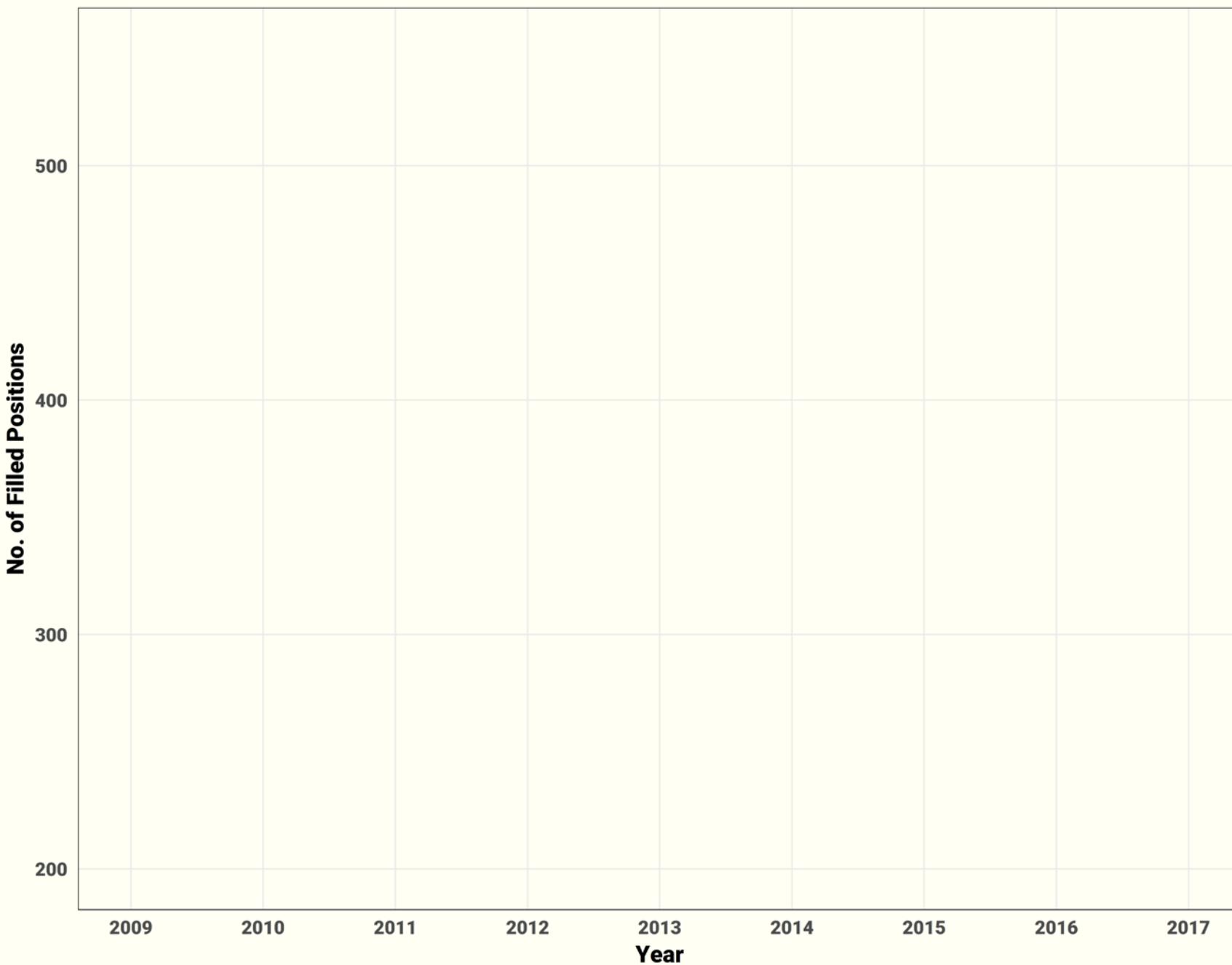
2

3

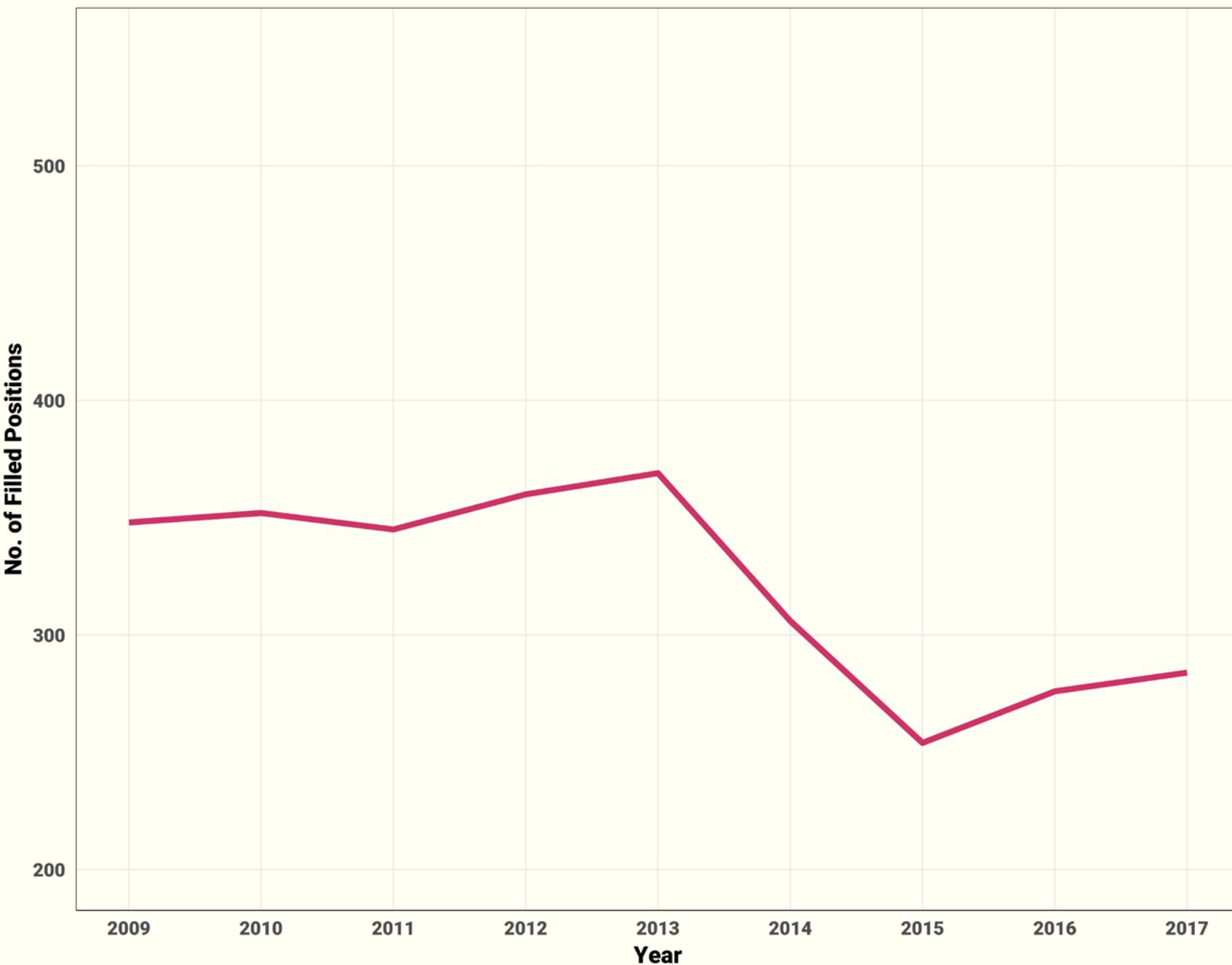
## Percentage of Unfilled Nephrology Positions: AY 2009 to AY 2018



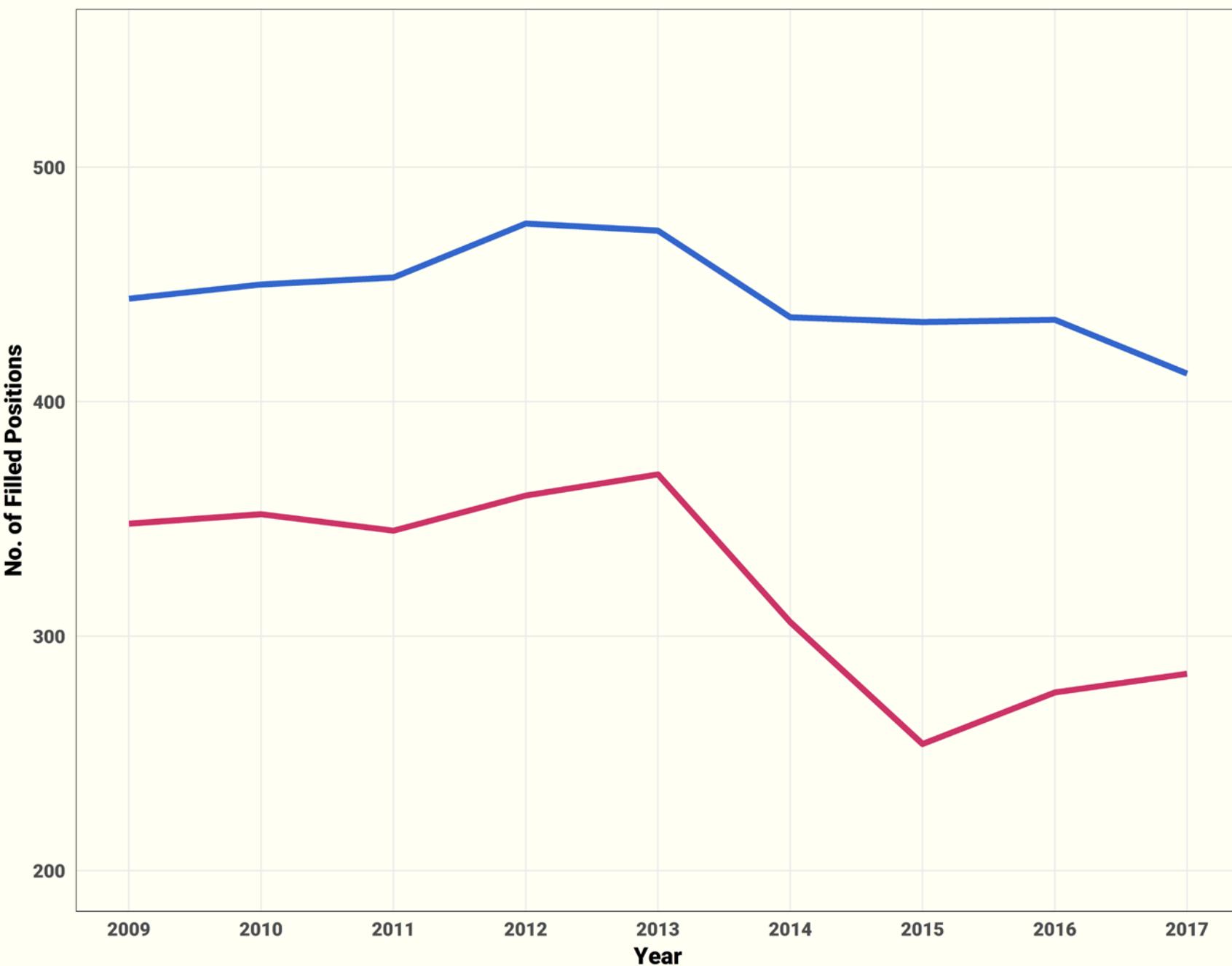
## **1st-Year Fellows in the Nephrology Match Era**



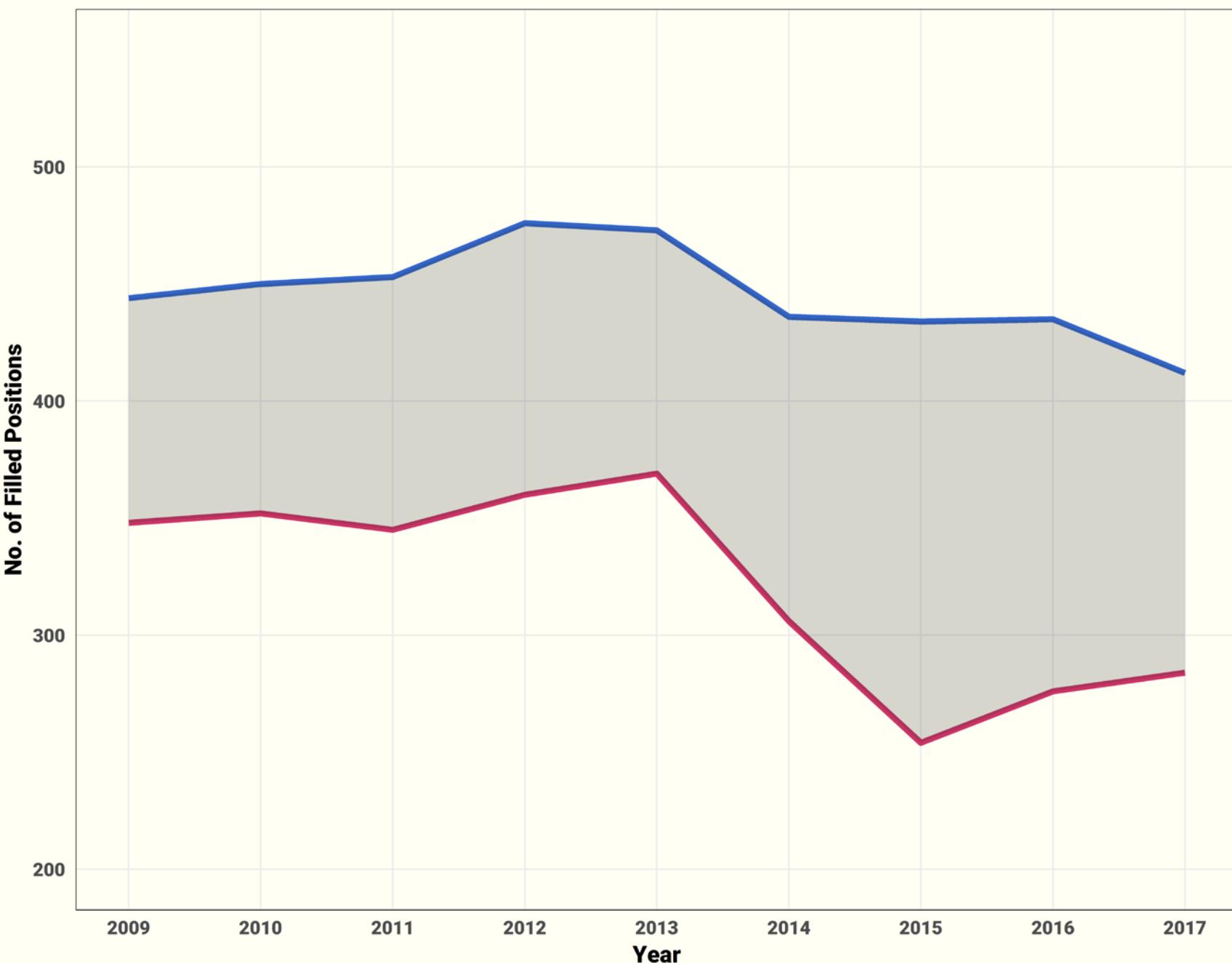
## 1st-Year Fellows in the Nephrology Match Era



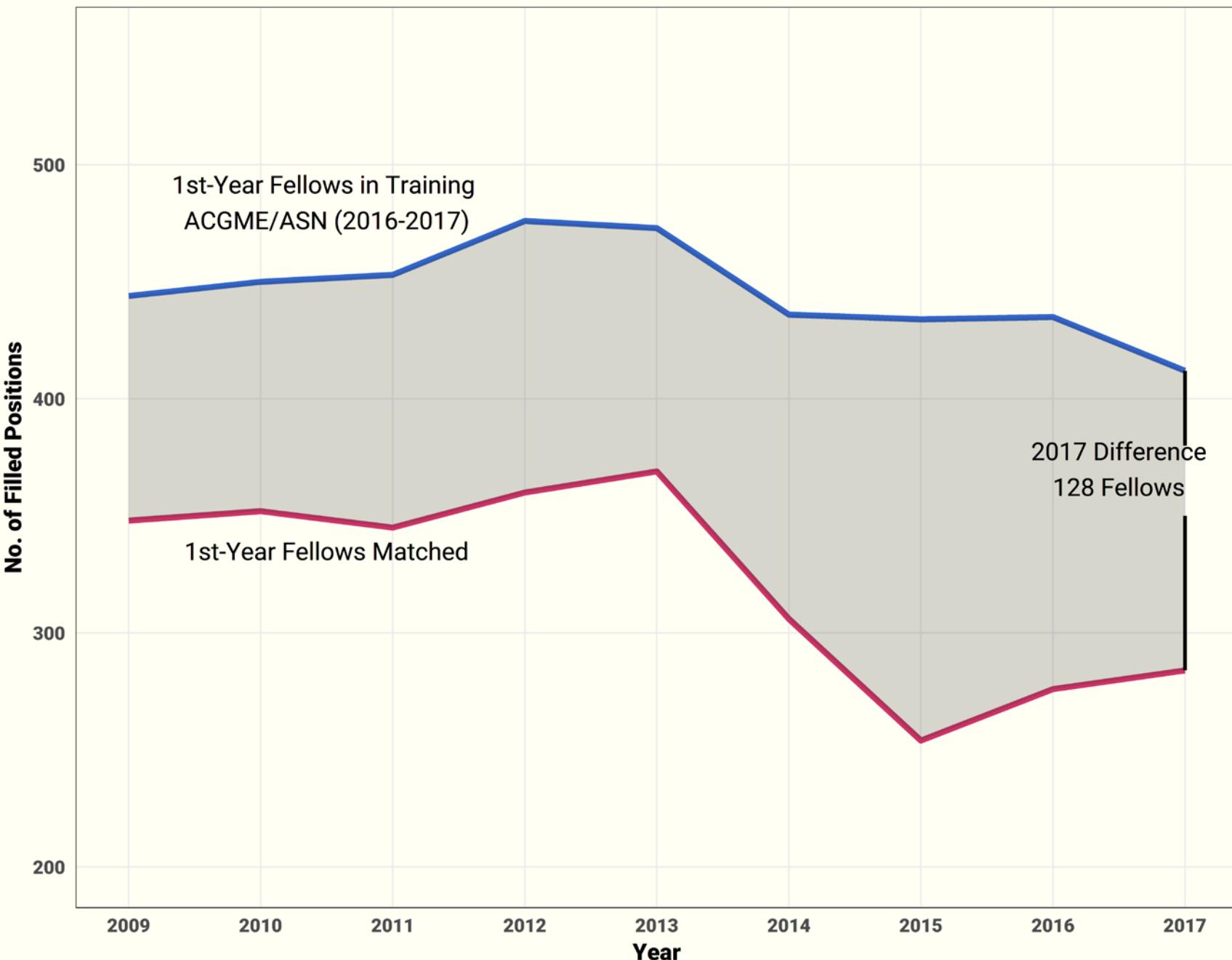
## 1st-Year Fellows in the Nephrology Match Era



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## 1st-Year Fellows in the Nephrology Match Era



# **Declining Nephrology Interest**

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## **Rightsizing**

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**Rightsizing**

**Define a specialty in transition**

# Declining Nephrology Interest

Rightsizing

Define a specialty in transition

**Asserting nephrology's value**



# 1 Data Gaps

**1 Data Gaps**

**2 Leverage Open Source Tools**

**1 Data Gaps**

**2 Leverage Open Source Tools**

**3 Data-Driven Decisions**

# **Next Steps**

## **Long-Term Outcomes**

# **Next Steps**

**Long-Term Outcomes**

**Actionable**

# **Next Steps**

**Long-Term Outcomes**

**Actionable**

**Diverse**



**Slides**

<https://github.com/ASNDataAnalytics/AAMC>

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[@kpivot](https://twitter.com/kpivot)