

Tracking medical resident publications: Insights for library services and graduate medical education support

Authors: Julia Stumpff, MSLIS
Mirian Ramirez, MLIS
Rick Ralston, MSLIS

Why this research?

01.

Medical Education Administration

encourages GME trainee publishing & wants to understand the current state of GME trainee publishing

02.

Library:

currently assists with searches and provides research assistance

03.

Library:

would like to add value & in turn learn more about the current state so we can better support GME publishing

Problem

- Scholarly research is part of GME training.
- It is difficult to track publications authored by IUSM GME trainees and understand publishing patterns.

Goal

Understand the publishing patterns of medical residents at IUSM in one academic year.

Literature Review

- Most studies focused on publishing patterns of all residents or fellows in one specialty or in one country.
- Some of the questions asked in this study are based on questions asked in those studies.

Study parameters

Study parameters – 2.0

- Cross-sectional study *& method-developing project*
- Cohort of residents matriculating July 2018 – June 2019 (*limited to residents at IUSM 3 years +*)
 - ~~Selected article types~~ *Any article type* published in a journal indexed in *PubMed or Scopus*
 - Published 1 year after start date through 1.5 years after completion date
 - Affiliated with or had at least one co-author affiliated with Indiana University

Research questions

Research questions 2.0

- How many GME residents publish?
- How many publications are there per GME resident?
- How many publications are there per GME program area?
- What types of articles do GME residents publish?
- What was the time-to-publication for residents who published?
- What are the impact factors of journals in which residents publish?
- *Is there a correlation between the number of years in residency and the number of publications?*
- *Are residents in specific GME program areas publishing:*
 - *specific publication types?*
 - *higher numbers of publications/resident?*
 - *in a specific timeframe?*

Methods

Methods 1.0

Data gathering:

- Searched one database (Scopus)
- Excluded curriculum, protocols, perspective/viewpoint articles, letters, and book chapters.

Data analysis:

- Coded publications by: Original research, Review, and Case Series/Case report
- Two reviewers independently reviewed and coded each publication. Disagreements were resolved by a third reviewer.
- Generated number of publications per trainee and number of citations per trainee

Methods 2.0

Data gathering:

- Searched *two databases* (PubMed & Scopus)
- *Excluded only Corrigendum & Erratum*

Data analysis:

- *Coded publications by study type & grouped them by larger categories*
- Two reviewers independently reviewed and coded each publication. Disagreements were resolved by a third reviewer *or by consensus.*
- Generated number of publications per trainee *and number of citations per trainee*

Methods 2.0

- Comprehensive search filters were created in PubMed and Scopus to include all potential affiliations to IUSM
- Scopus IDs identified for each resident who had them. Scopus IDs were searched along with the affiliation filter
- All matriculating residents (last name & first initial) were searched in PubMed along with the affiliation filter.
- Created Excel calculations to determine the time lag between the initial start date in the residency program and the publication date of the first article.
- Created a definition file for study type.
- Retrieved Journal Impact Factor (JIF) and Journal Citation Indicator (JCI) percentile rank of each journal in which residents published from **Journal Citation Reports**[™]

Resident sample

of residents in sample

1.0
266 vs. 2.0
219

47 residents not in IUSM
residency 3+ yrs

of residents publishing 1 or more articles

1.0
90

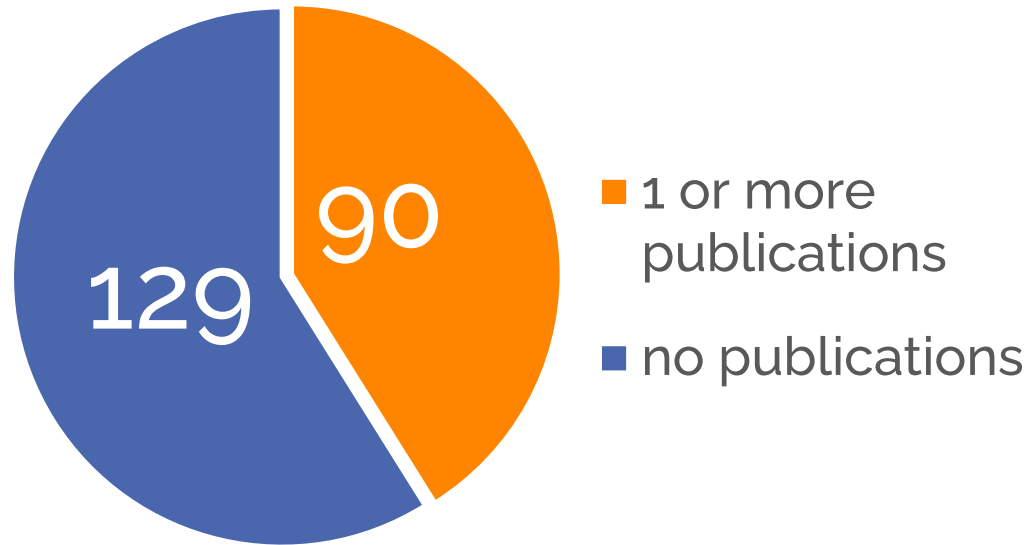
VS.

2.0
90

- 47 fewer residents in 2.0 sample
- Searched Scopus & PubMed
- Included more article types
- Only 75 residents published an article in both analyses

41% of matriculating residents had 1 or more publications

matriculating residents (2018-19)
in residency 3+ years



Publications

Publications identified

Articles 1.0

Residents and unique articles

# of Residents	# of unique articles
90	291

Created with Datawrapper

Articles 2.0

Residents and unique articles

# of Residents	# of unique articles
90	321

Created with Datawrapper

more article types included & an additional database searched in 2.0

53% of 90 residents who published had more than 1 publication

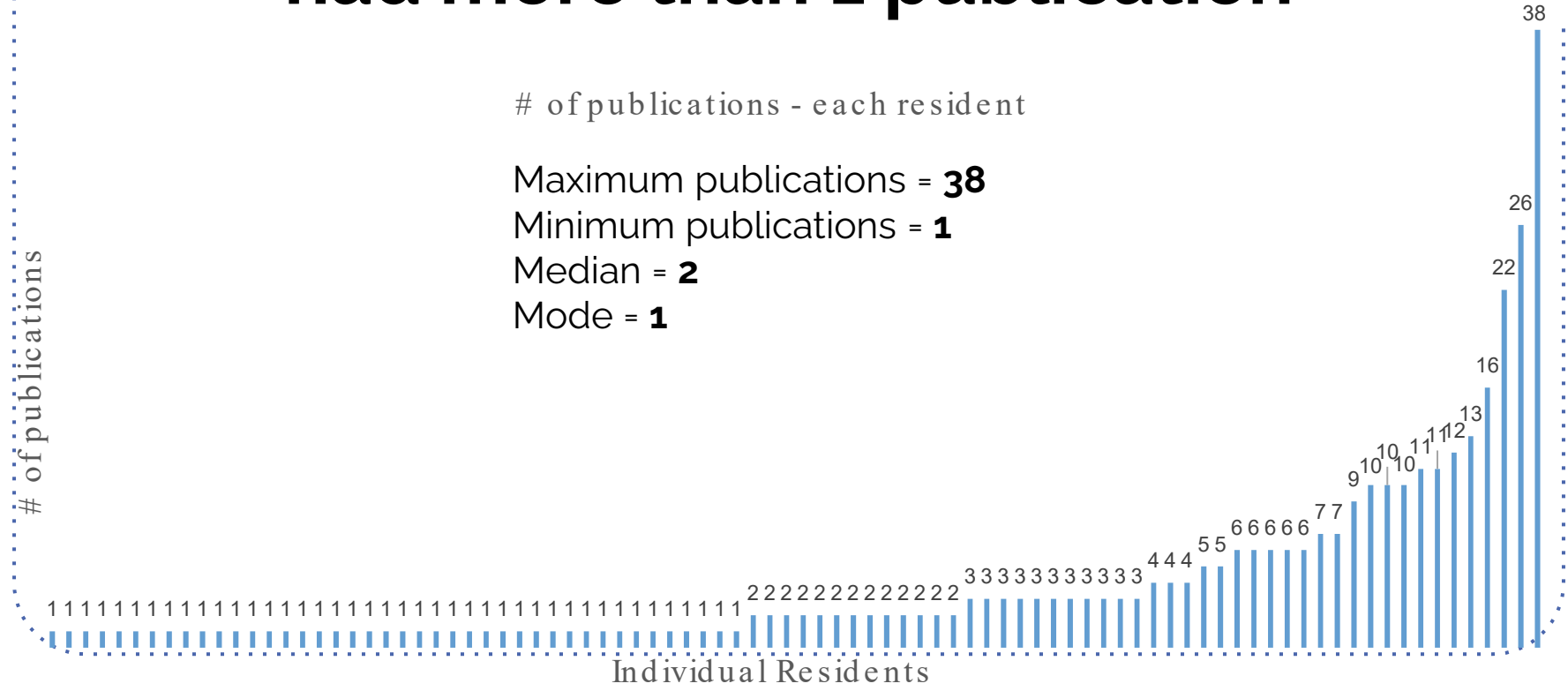
of publications - each resident

Maximum publications = **38**

Minimum publications = **1**

Median = **2**

Mode = **1**

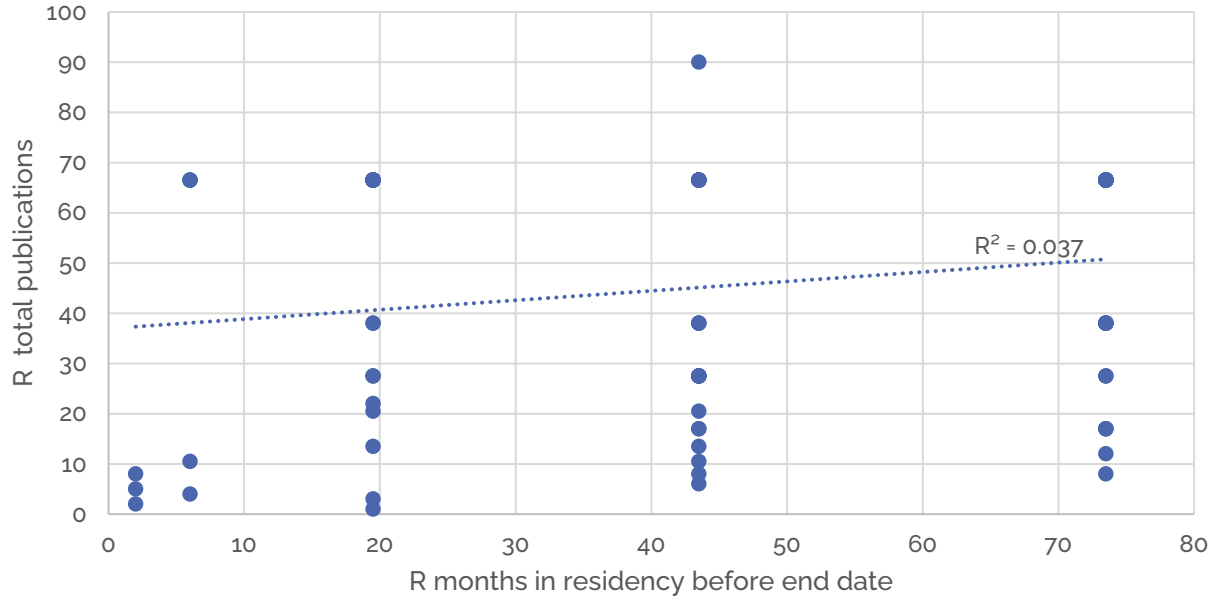


Correlation:

yrs in residency & total publications

Years in residency correlated with total publications?

Spearman correlation coefficient
is positive but weak



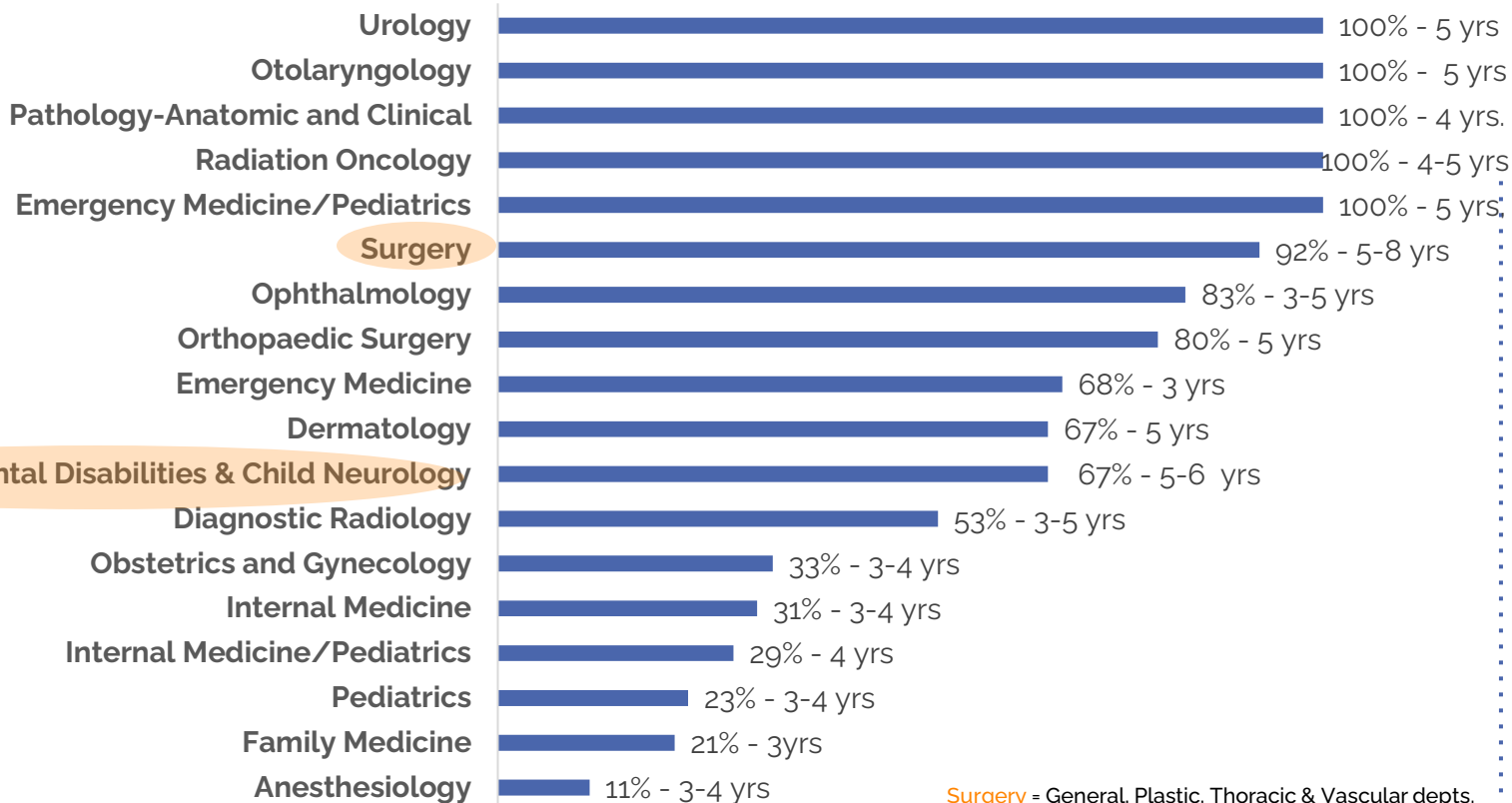
**Spearman
correlation
coefficient = 0.1924**

When the Spearman
coefficient is between
-1 and +1, the variables
are related.

**Publications per
program area**

% of residents publishing in each program area

Program area



% of matriculating residents who published

Surgery = General, Plastic, Thoracic & Vascular depts.
Neurodevelopmental Disabilities & Child Neurology
are two similar depts. that fall under Pediatrics

100% of matriculating students publishing

- <5 total residents/program area matriculated
- all were in residency 4+ yrs



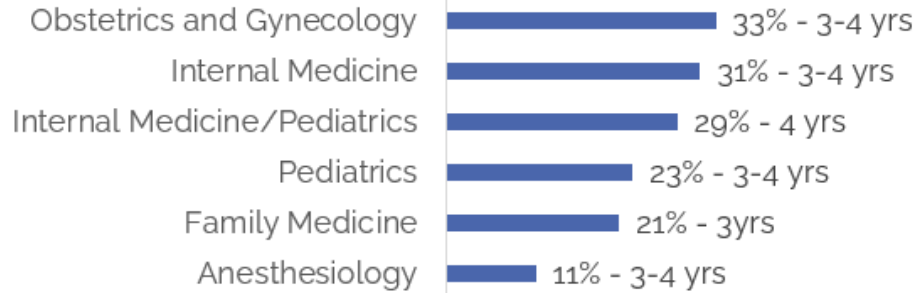
53-92% of matriculating students publishing



Department	# of matriculating residents
Surgery	13
Ophthalmology	≤ 6
Orthopaedic Surgery	≤ 6
Emergency Medicine	19
Dermatology	≤ 6
Neurodevelopmental Disabilities & Child Neurology	≤ 6
Diagnostic Radiology	15

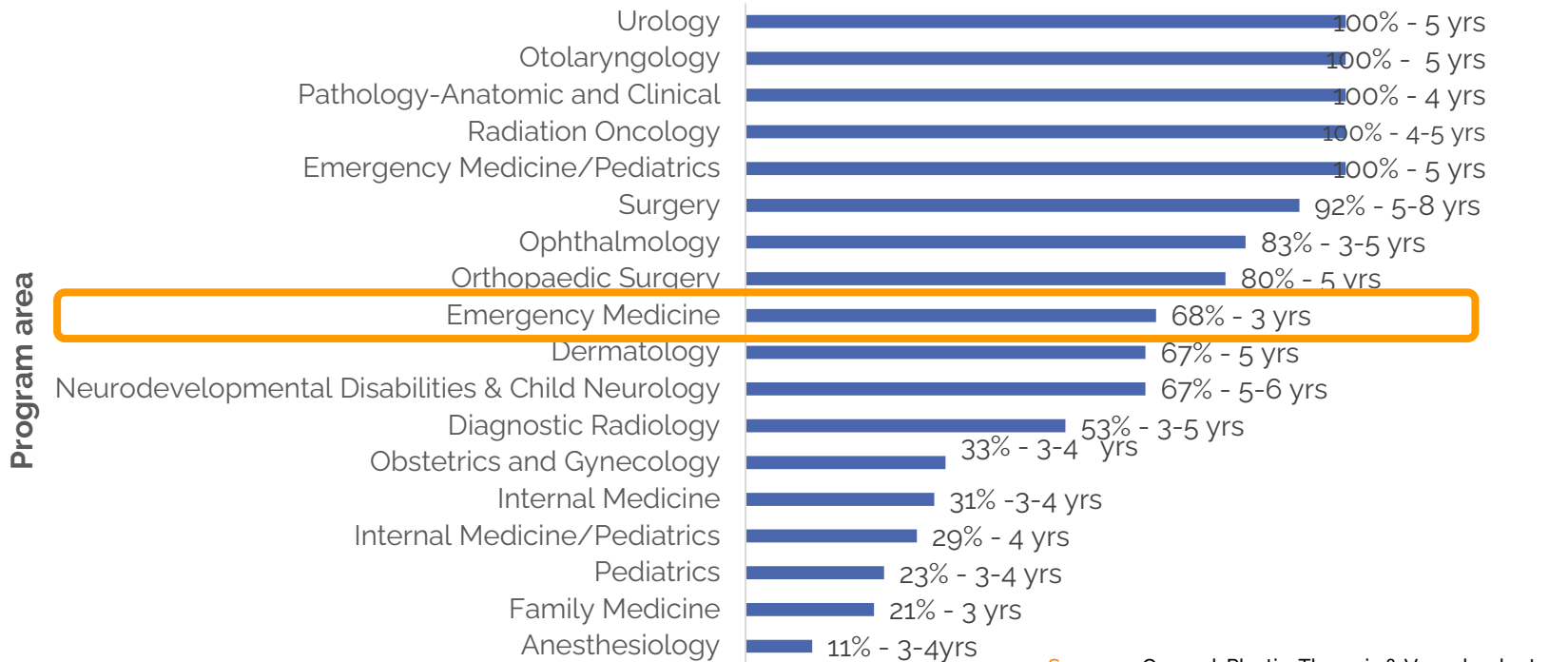
Surgery = General, Plastic, Thoracic & Vascular depts.
Neurodevelopmental Disabilities & Child Neurology are two similar depts. that fall under Pediatrics

11-33% of matriculating students publishing



Department	# of matriculating residents
Obstetrics and Gynecology	9
Internal Medicine	35
Internal Medicine/Pediatrics	14
Pediatrics	26
Family Medicine	14
Anesthesiology	27

Emergency Medicine – 68% of 19 residents, 3 yr residency



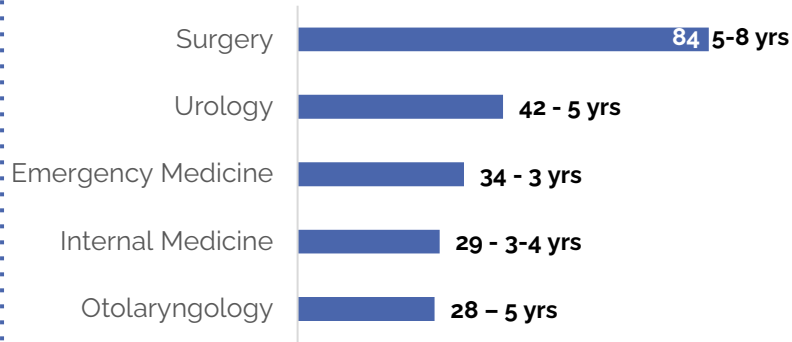
% of matriculating residents who published

Surgery = General, Plastic, Thoracic & Vascular depts.
Neurodevelopmental Disabilities & Child Neurology
are two similar depts. that fall under Pediatrics

Publishing in the top 5 program areas

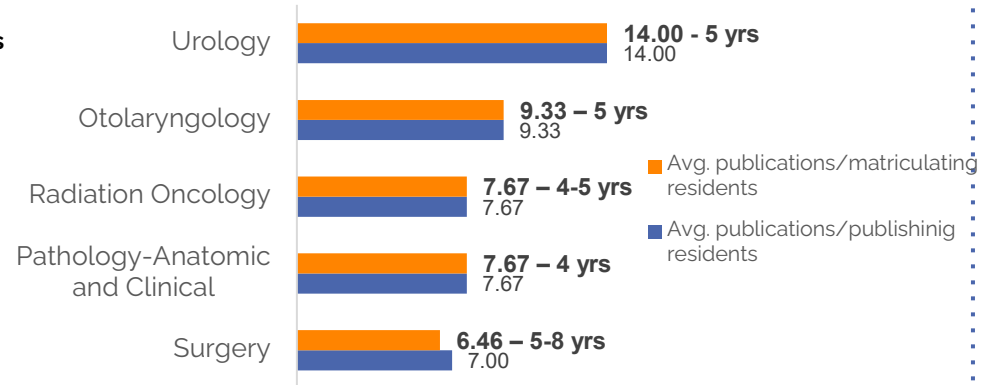
Publications/ program area

Surgery (General, Plastic, Thoracic & Vascular)
most publications



Publications/ resident/ program area

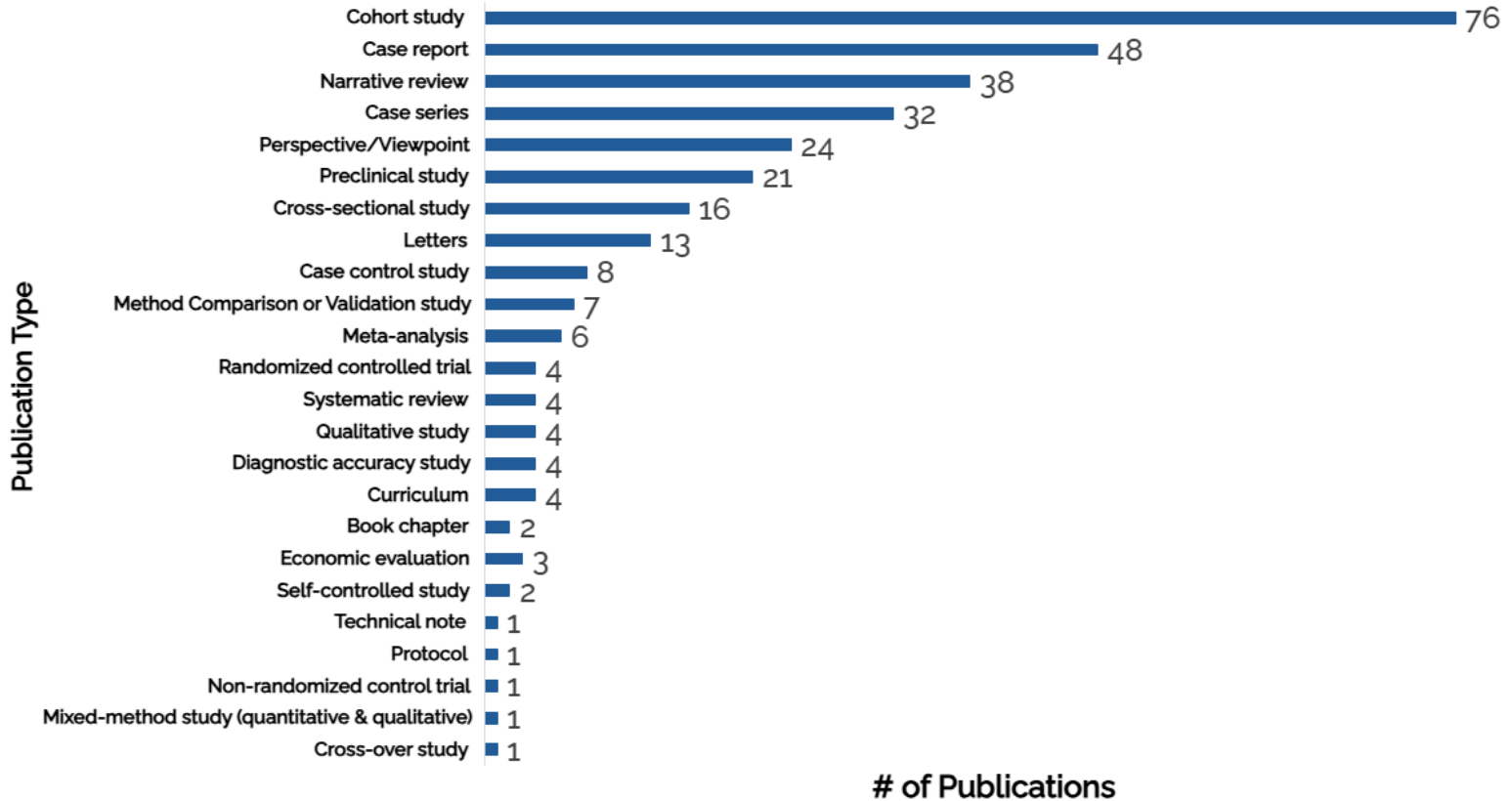
Urology
most publications/resident



Surgery = General, Plastic, Thoracic & Vascular depts.
Neurodevelopmental Disabilities & Child Neurology
are two similar depts. that fall under Pediatrics

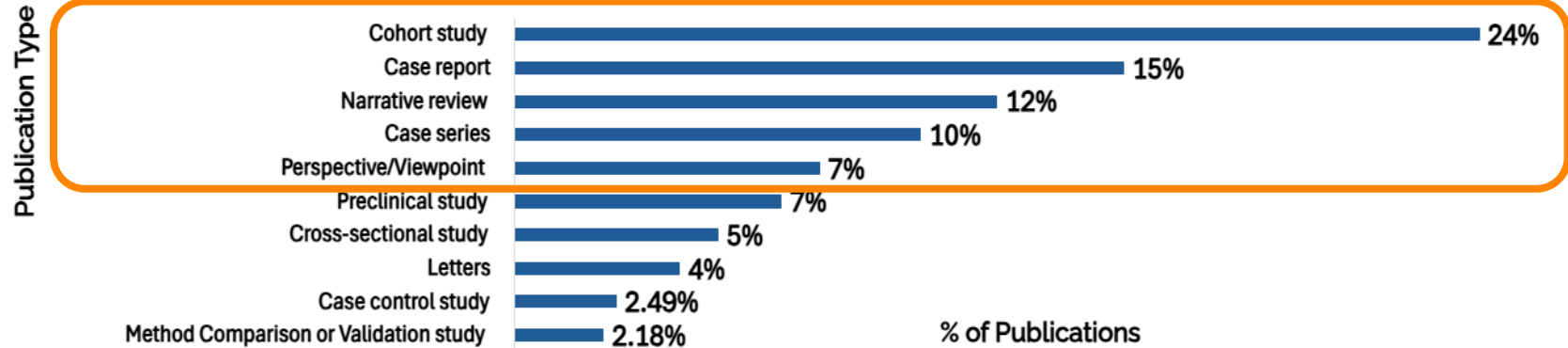
Publication Types

321 publications - 24 publication types



68% of articles - 5 publication types

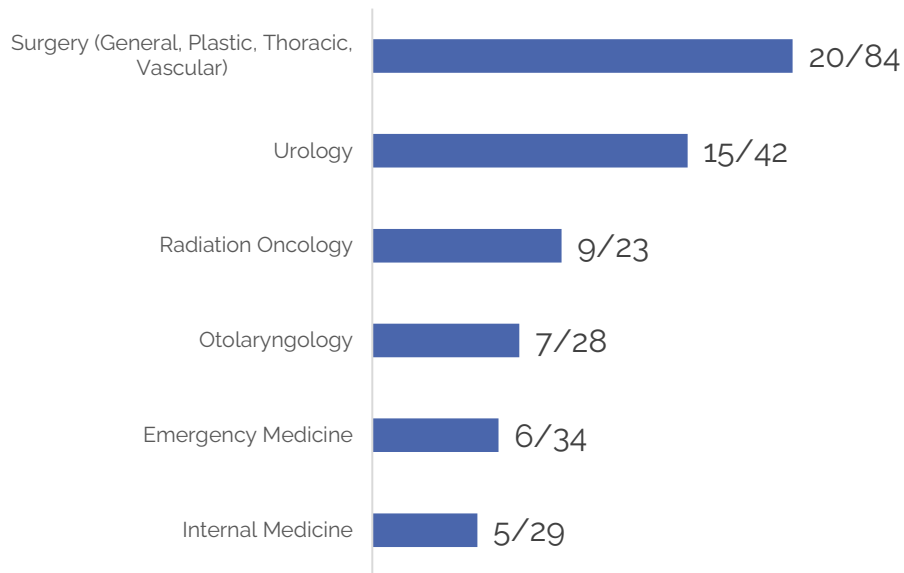
Top 10 publication types



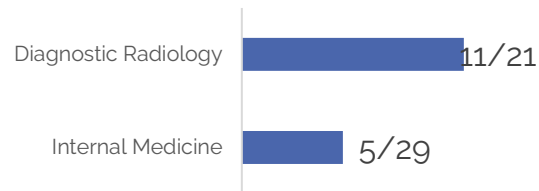
Publication type by selected program areas

of pub type / total pubs

Cohort Studies



Perspective/Viewpoint



Case Reports

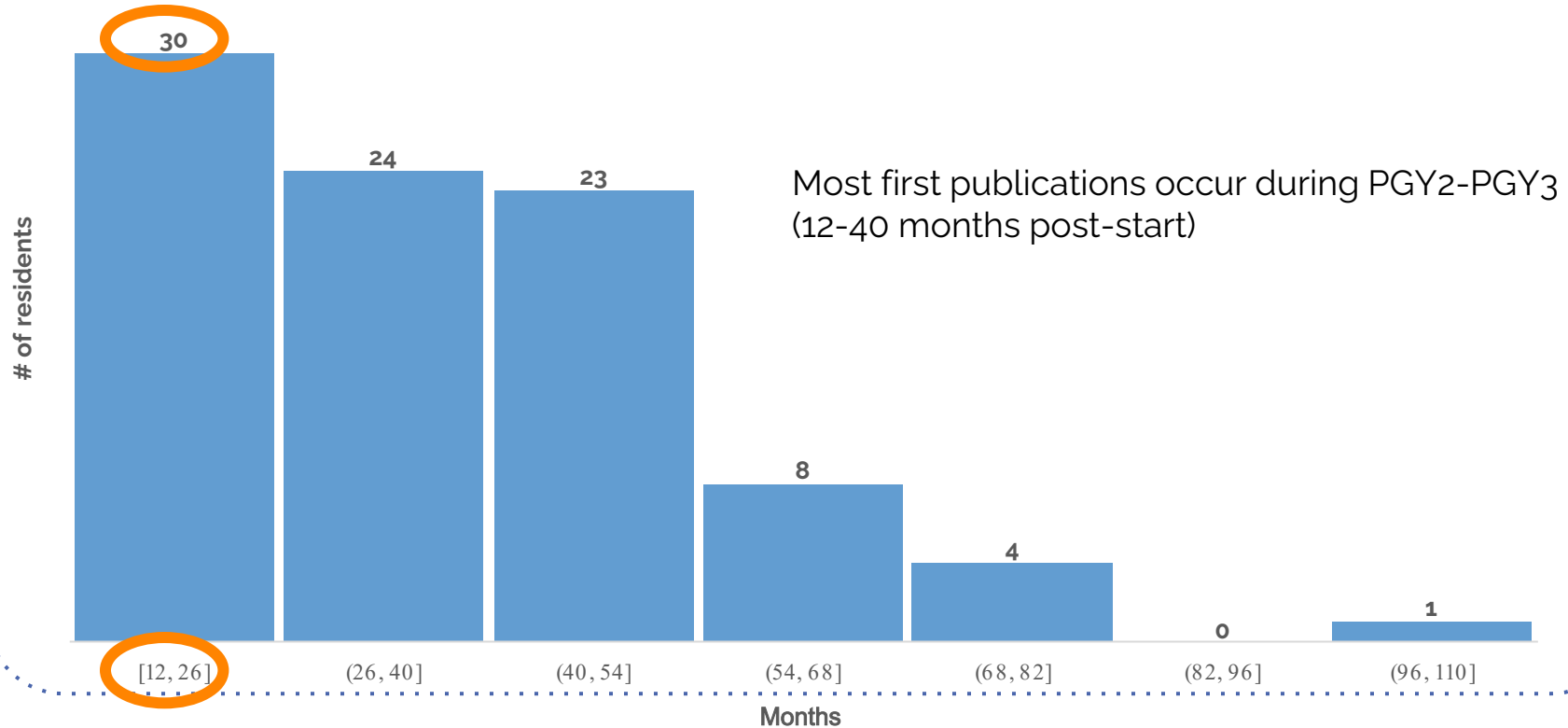


Case Series

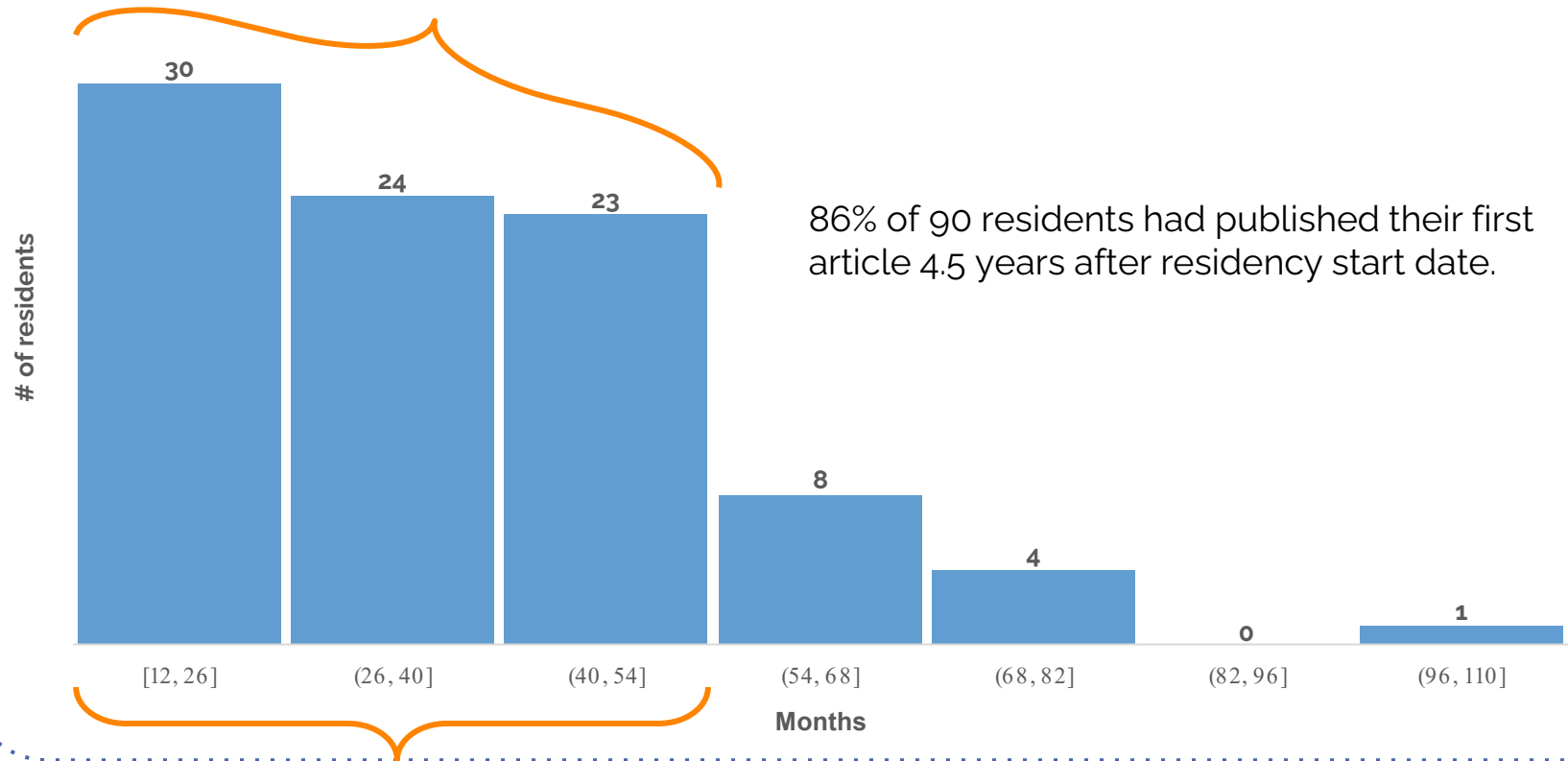


Time to publication

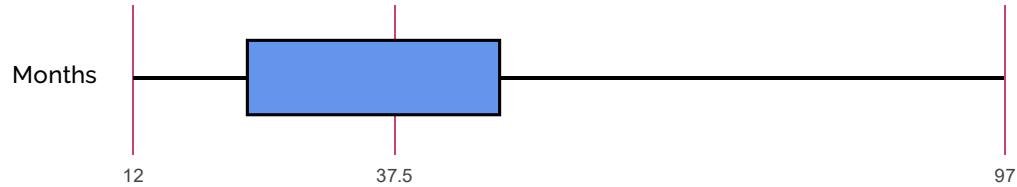
Months to first publication



Months to first publication



Time from start date to first publication



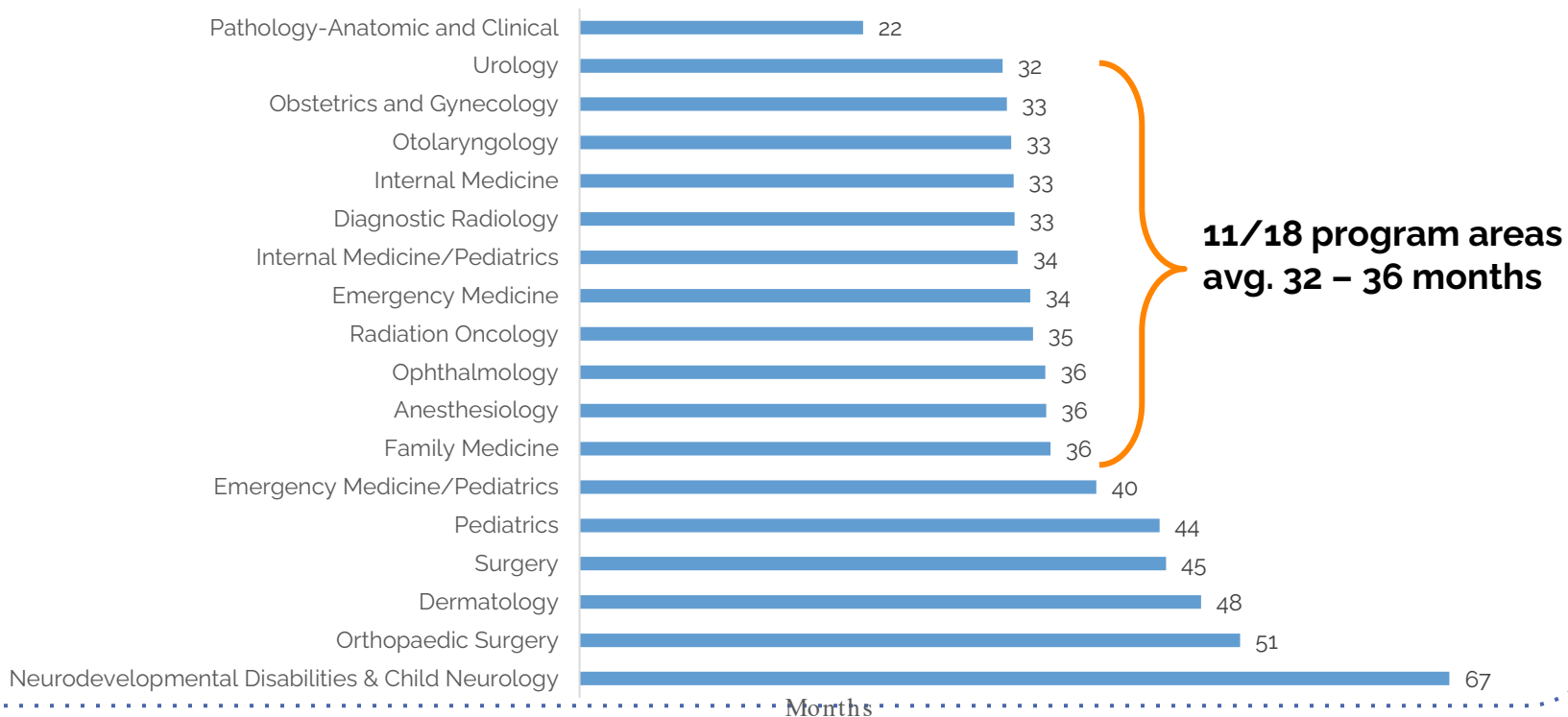
90 IUSM residents: months from start date to first publication

Sample size (n):	90
Minimum:	12
Q1:	23
Median:	37.5
Q3:	48
Maximum:	97
Mean (\bar{x}):	38
Skewness:	1
Skewness Shape:	
positive_skew Asymmetrical, right/positive (pval=0.002)	
Excess kurtosis:	1
Tails Shape:	
normal tailsPotentially Mesokurtic, normal like tails (pval=0.302)	
Outliers:	97

Median 37.5 months (End of PGY3)
IQR: 23-48 months (PGY2 - PGY4)
Range: 12-97 months

Time to first publication by program area

Average months after start date until 1st publication: **22 – 67 months**



Journal Metrics

Journals in which residents published

1.0
188 vs. 2.0
208

Journal Impact Factor category rank

1.0

2.0

Q1

22.3%

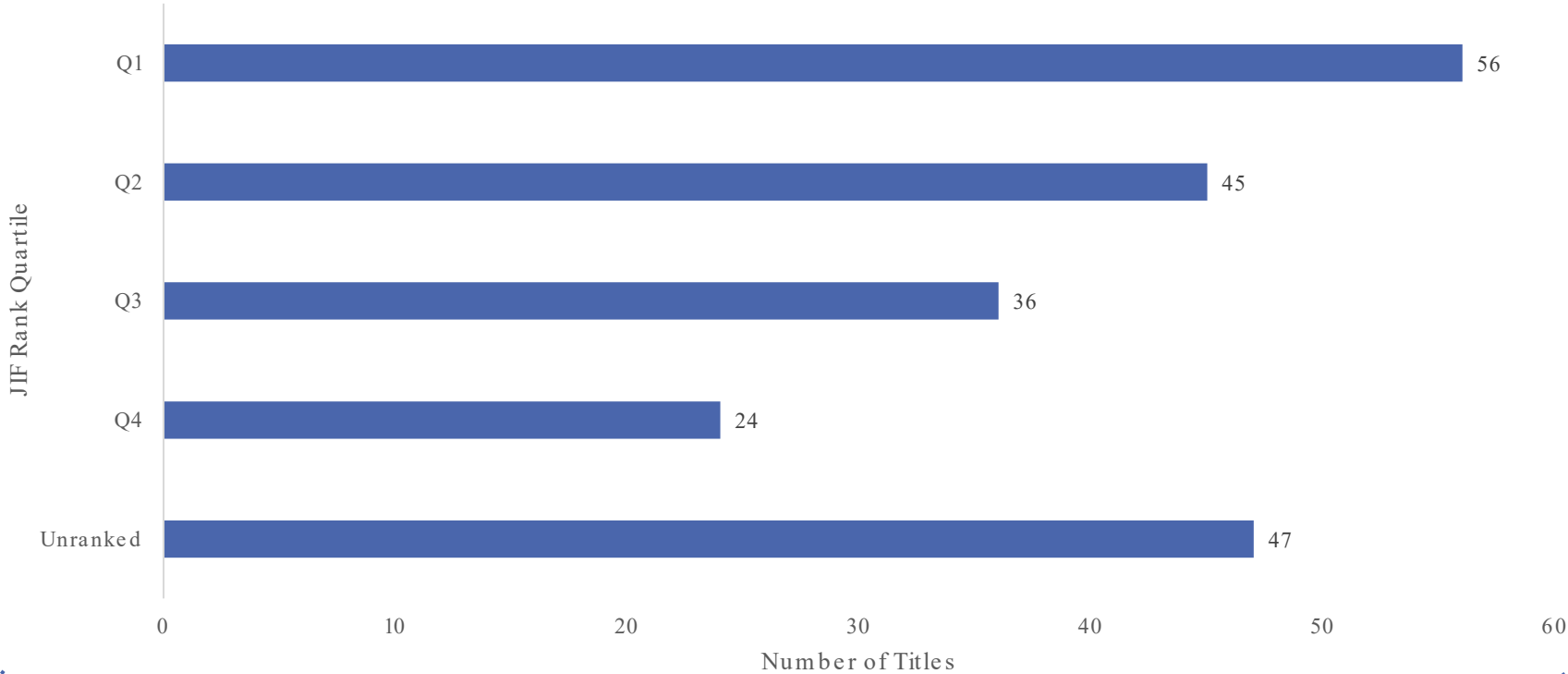
26.9%

Q2

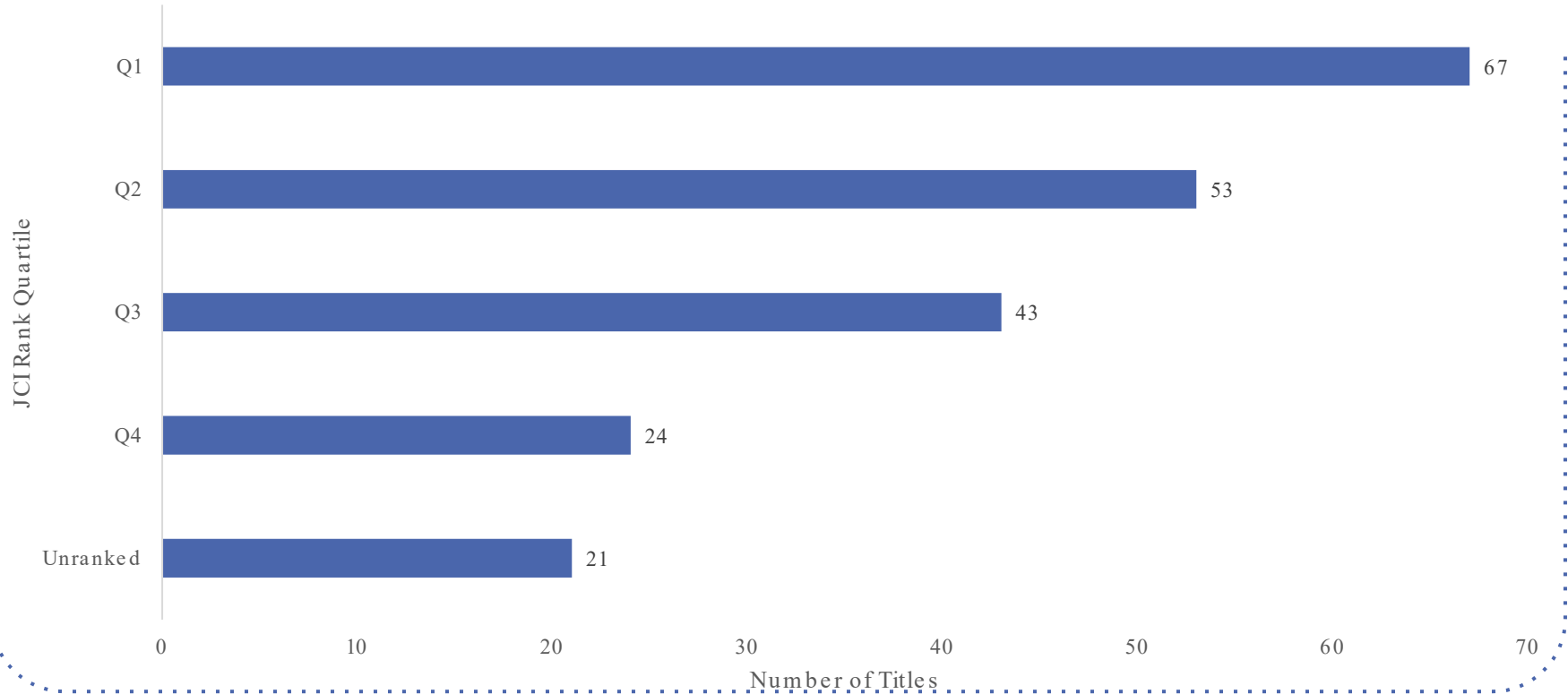
26.1%

21.6%

27% of Journals in Which Residents Published Ranked in the Top Quartile of Their Journal Impact Factor (JIF) Category



32% of Journals in which residents published ranked in the top quartile of their journal citation indicator (JCI) category



Conclusions

Conclusions:

- A substantial percentage (41%) of matriculating residents published at least one publication.
- There is a weak correlation between # of years in residency and # of publications.
- 11/18 program areas average between 32-36 months until 1st publication
- 26.9% of journals ranked in the top quartile of their category by JIF. 32.2% of journals ranked in the top quartile of their category by JCI.
- With median publication at 37.5 months (end of PGY3), early research mentoring during PGY1-PGY2 could optimize publication timing and productivity.
- Librarians could target guidance on publication types for residents in specific program areas.
- Librarians could time promotion of services to specific program areas based on average months to 1st publication
- Research Service librarians might target their service promotion to high-publishing program areas.

Key Takeaways – 2.0

Key Takeaways from 2.0

Methodology:

- Enhanced publication data: Moved from single to dual database search (PubMed + Scopus) = Stronger evidence
- Focused analysis: Established residents - only 3+ years at IUSM (more meaningful institutional commitment)
- Detailed publication categorization: Better understanding of research patterns

Results:

- Key timing insight: Peak publishing 1-4 years post-residency → Target PGY1
- Program-area-specific patterns identified: Enables targeted librarian support

Limitations & Future Research

Limitations:

- Single institution (IUSM) - may limit generalizability
- Two databases only (PubMed/Scopus)
- Single cohort year - snapshot vs. longitudinal trends
- COVID-19 timeframe - potential impact on research productivity patterns

Future Research:

- Analyze multiple years of GME residents.
- Department-specific success factor analysis:
 - Scholarship programming?
 - Research support?
 - Ratio of mentors to residents?

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- Box plot created using Statistics Kingdom <https://www.statskingdom.com/boxplot-maker.html>
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Questions ?

Julia Stumpff, MSLIS
Instructional Design Librarian
Ruth Lilly Medical Library
jstumpff@iu.edu

Mirian Ramirez, MLIS
Research Metrics Librarian
Ruth Lilly Medical Library
mirirami@iu.edu

Rick Ralston, MSLIS
Associate Director for Content
Management & Assessment
Ruth Lilly Medical Library
rralston@iu.edu



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