



Rural Residency Applicant Ranking and Matching Behaviors: A Study on the 2022, 2023, 2024 & 2025 Match Cycles

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Agenda

- **Background on Rural Healthcare**
- **Research Questions & Study Aims**
- **Methods**
 - Bivariate Analyses
 - Regression Analyses
- **Results**
- **Discussion**
- **Limitations & Conclusions**
- **Small Group Discussion**
- **Q&A**

Background on Rural Healthcare

Rural health disparities



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graph TD; A[Rural health disparities] --> B[1 in 5 Americans (66M) live in rural areas]; B --> C[Rural communities have limited specialty care access]; C --> D[Limited residency programs]; D --> E[Rural health disparities persist];
```

1 in 5 Americans (66M) live in rural areas

Rural communities have limited specialty care access

Limited residency programs

Rural health disparities persist

Research Questions & Study Aim

Research Questions:

1. Develop profiles of applicant's characteristics who rank and match into programs in rural settings vs. non-rural settings.
2. Understand applicant ranking behaviors of rural vs. non-rural programs as they relate to the applicant's characteristics

Study aim:

The goal is to identify applicant characteristics most likely to rank or match into rural programs with a focus on variables significant to rurality.

Methods

- **RUCA code use**
- **Bivariate analyses** to examine relationship between applicant characteristics of interest and rurality (rural vs. non-rural based on RUCA codes)
- **Logistic regression models** to examine factors that predict an applicant's odds of ranking or matching into a rural program:
 1. Did the applicant rank a rural program first on their ROL?
 2. Did the applicant rank a rural program in the one of the top three spots on their ROL?
 3. Did the applicant rank a rural program anywhere on their ROL?
 4. Did the applicant match into a rural program?

Sample – 2022, 2023, 2024 & 2025 Match Years

For the bivariate analyses
109,278 applicants in total

- 60,228 US MDs
- 23,181 DOs
- 9,140 US-IMGs
- 16,729 non-US IMGs

The regression analysis
included 71,943
applicants

Variables

Applicant Characteristics (self-reported)

- Personal Characteristics: Sex, Race, underrepresented in medicine (URiM)
- Socioeconomic background: Received public assistance and/or contributed to family income prior to 18 years of age, first-generation status

Academic/Professional Characteristics (self-reported)

- Volunteer experiences
- Research experiences
- Abstracts/Presentations/Publications
- Work experiences
- AOA member
- PhD degree
- Other graduate degree
- Step and/or Level performance

Applicant type

- MD
- DO
- US IMG
- Non-US IMG

Bivariate Analyses – Results

Sex

Applicant Type

Sexual
Orientation

URiM

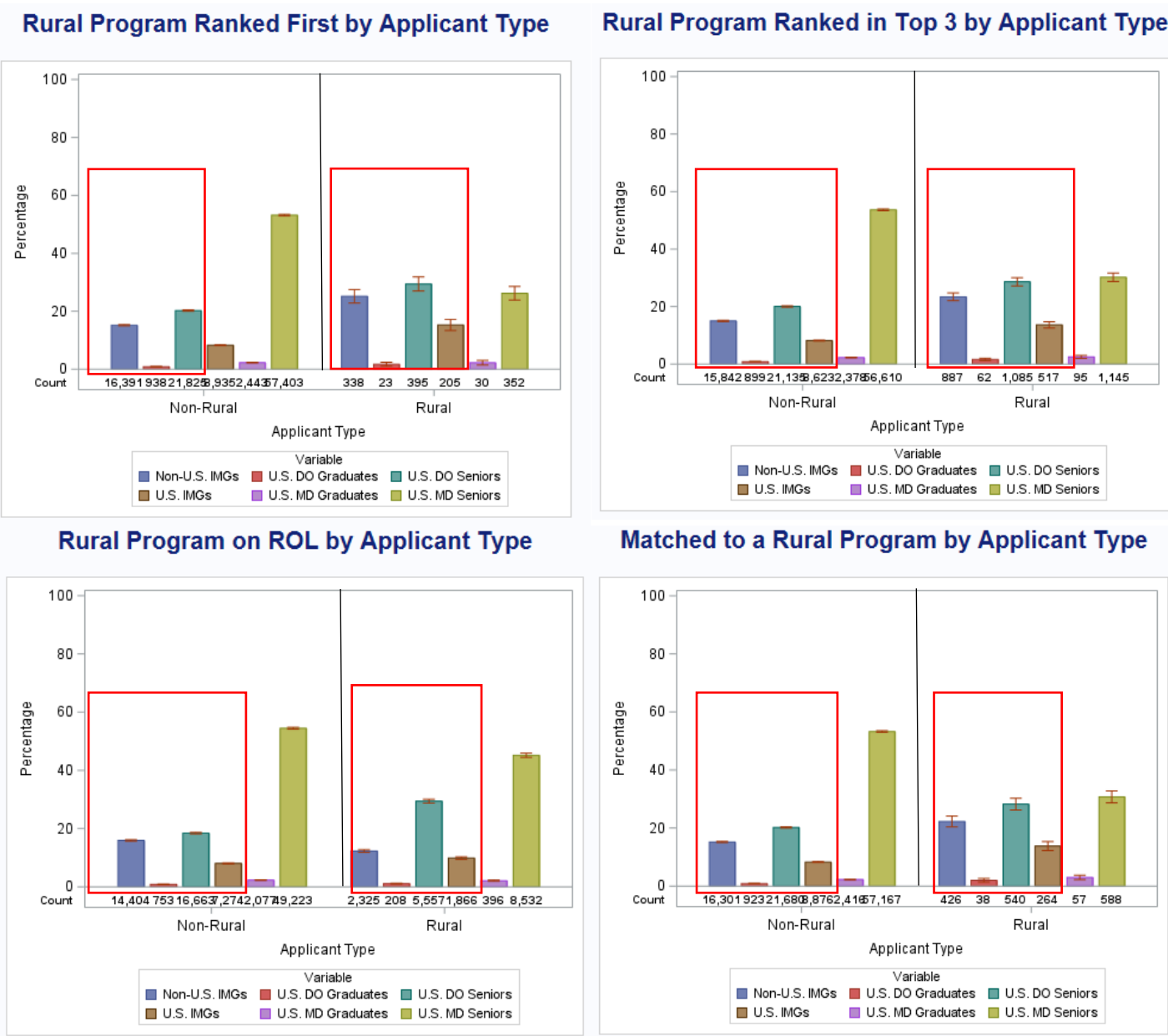
Childhood
Urbanicity

AOA (honors
society)

Applicant
Rurality

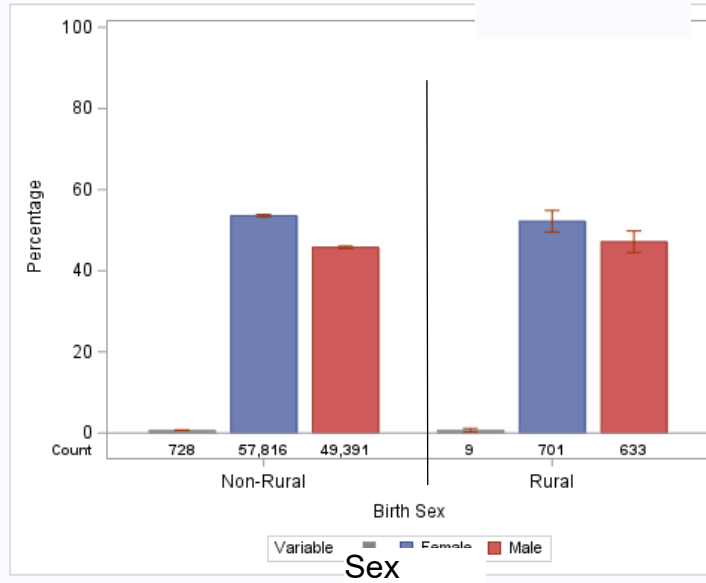
Continuous
Variables (4
outcomes of
interest)

Applicant Type

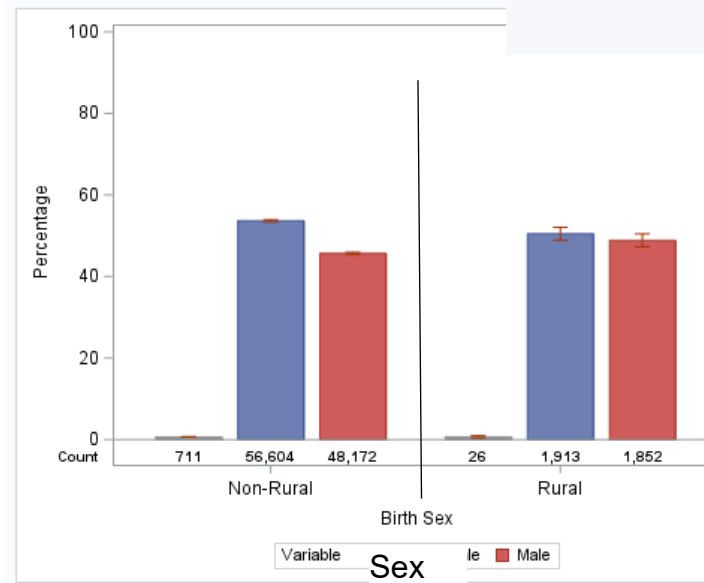


Sex

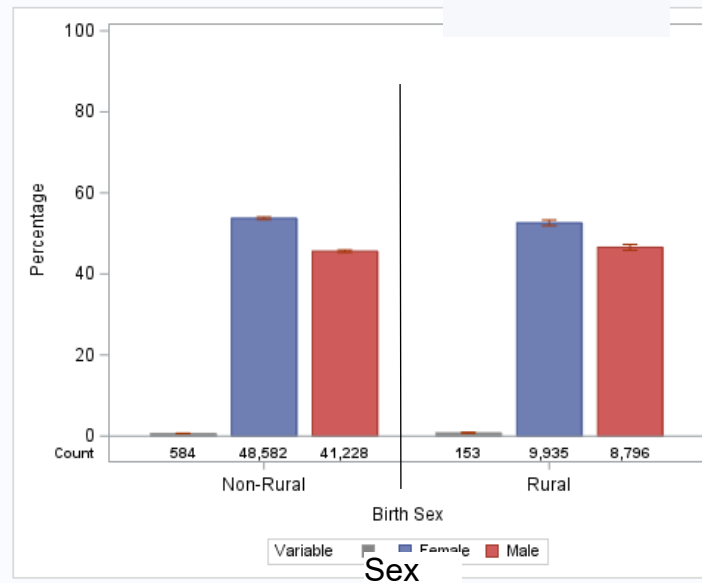
Rural Program Ranked First by Birth Sex



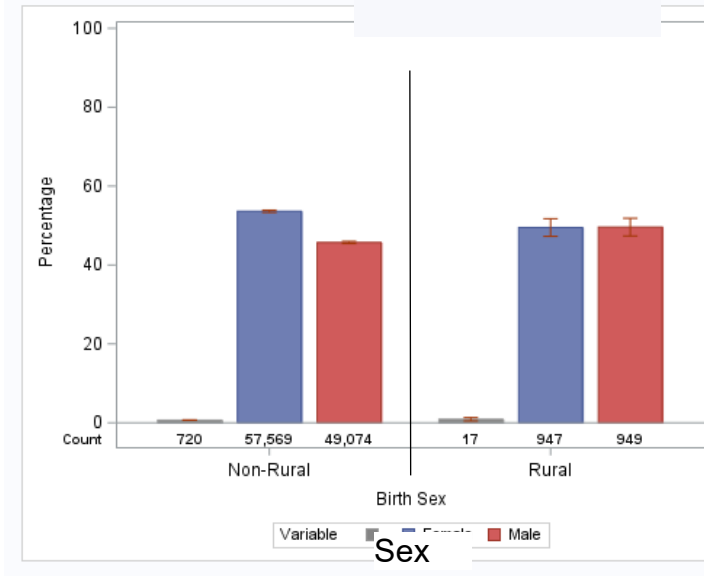
Rural Program Ranked in Top 3 by Birth Sex



Rural Program on ROL by Birth Sex

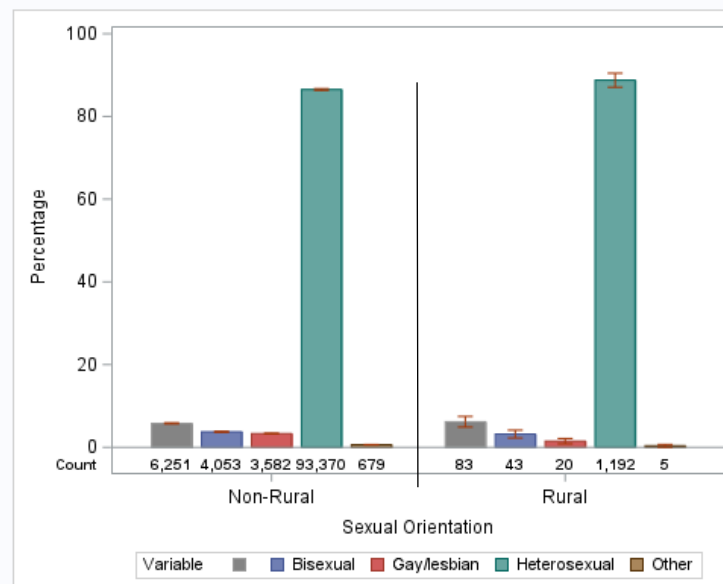


Matched to a Rural Program by Birth Sex

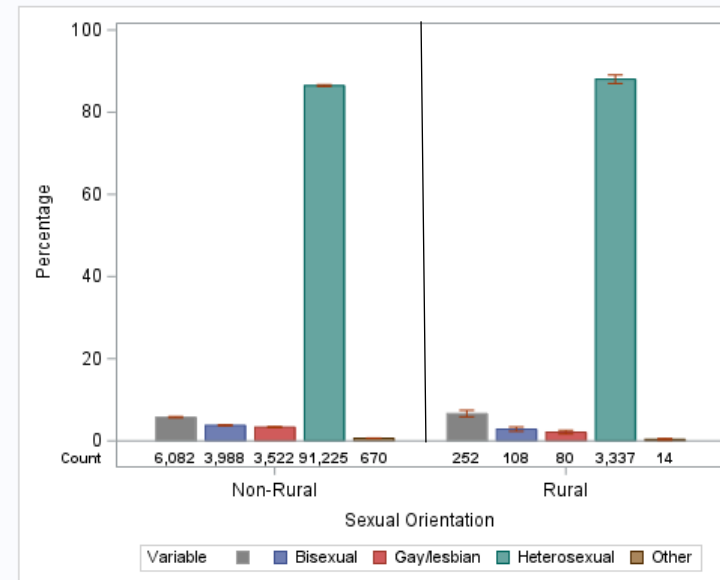


Sexual Orientation

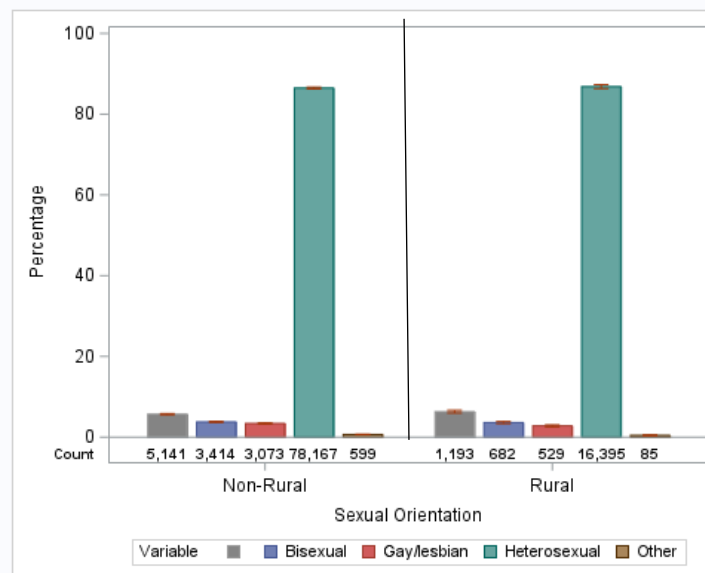
Rural Program Ranked First by Sexual Orientation



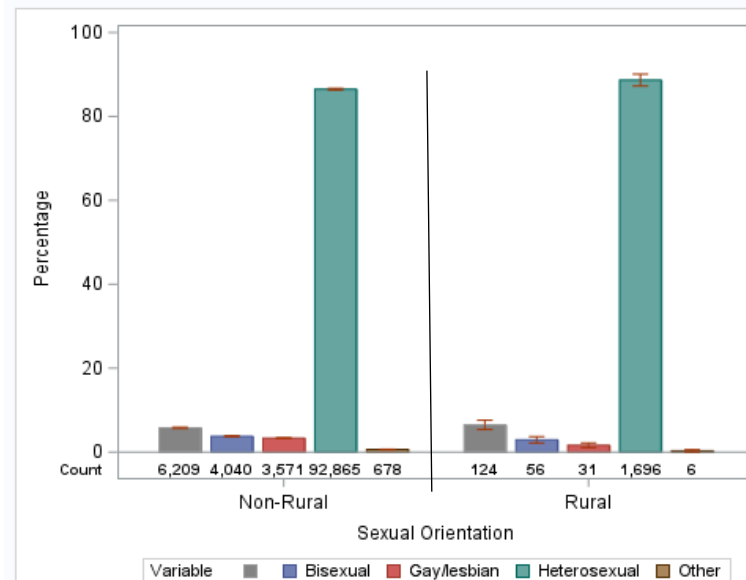
Rural Program Ranked in Top 3 by Sexual Orientation



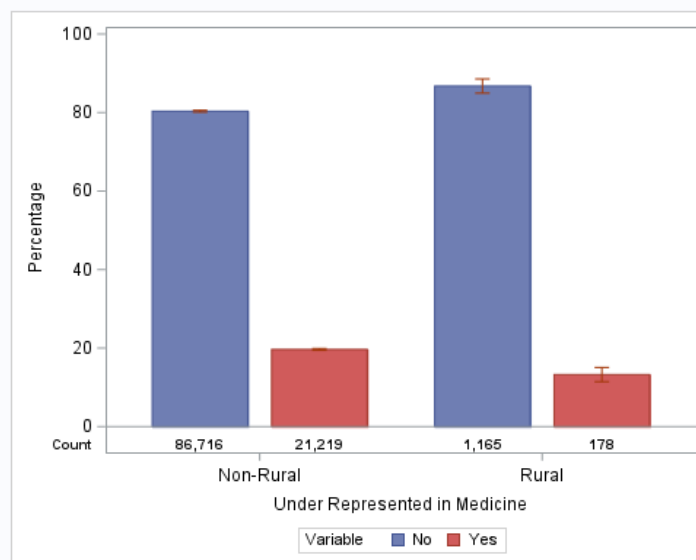
Rural Program on ROL by Sexual Orientation



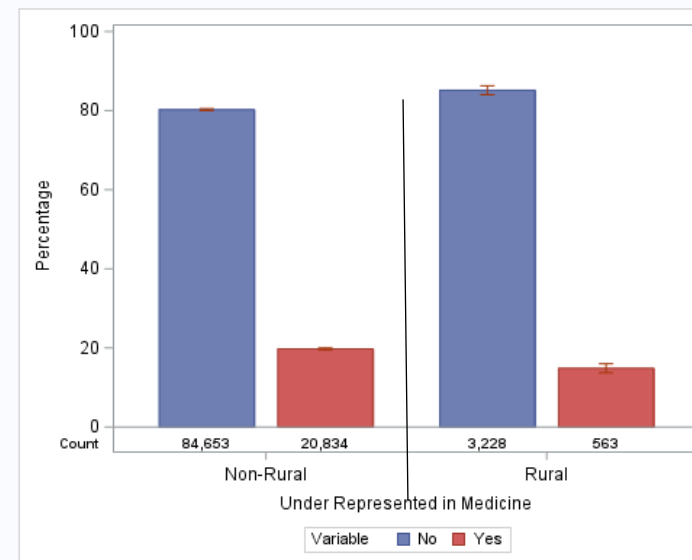
Matched to a Rural Program by Sexual Orientation



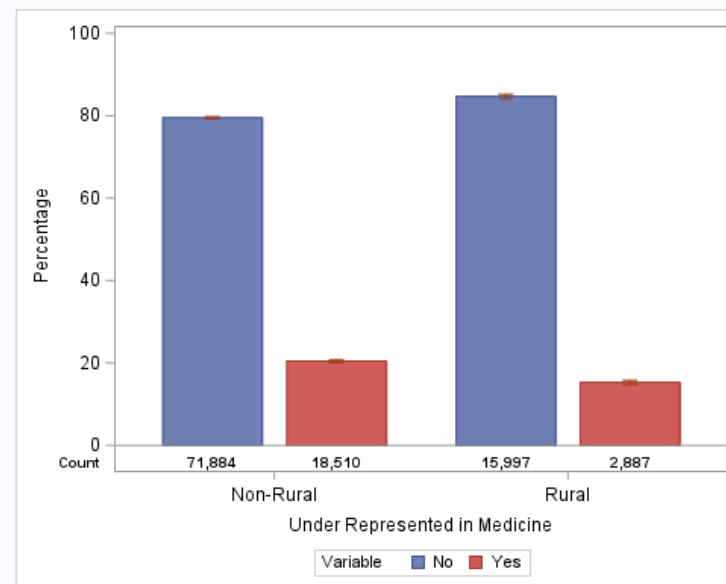
Rural Program Ranked First by Under Represented in Medicine



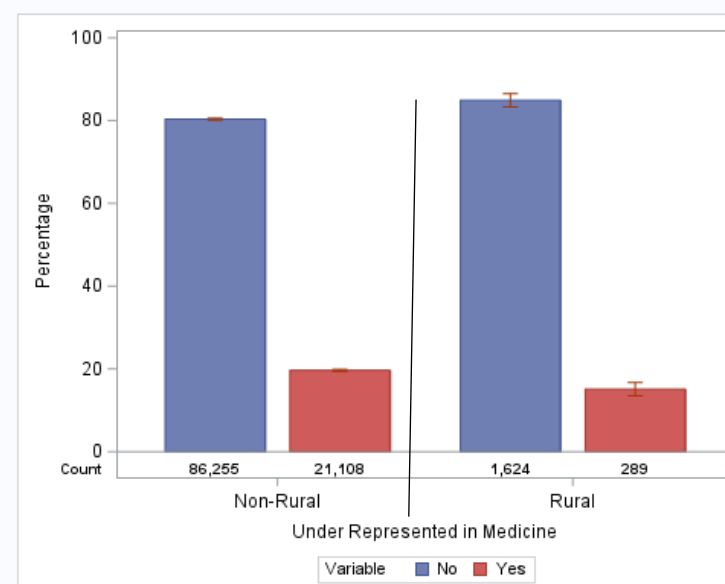
Rural Program Ranked in Top 3 by Under Represented in Medicine



Rural Program on ROL by Under Represented in Medicine



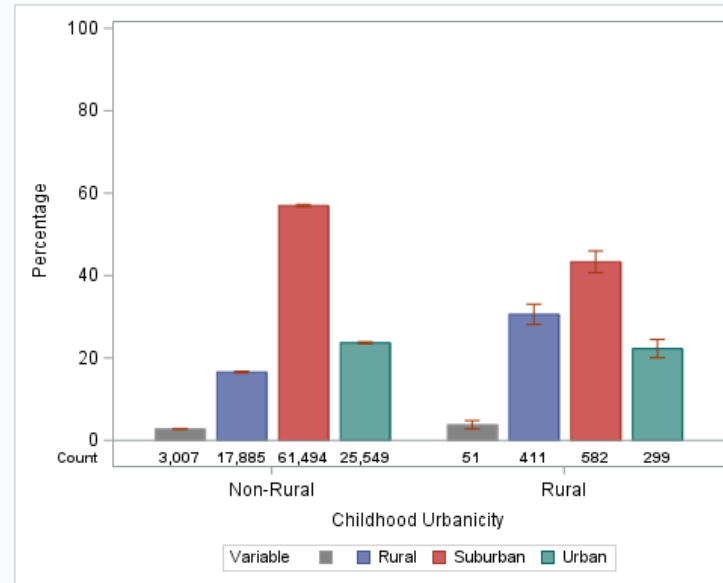
Matched to a Rural Program by Under Represented in Medicine



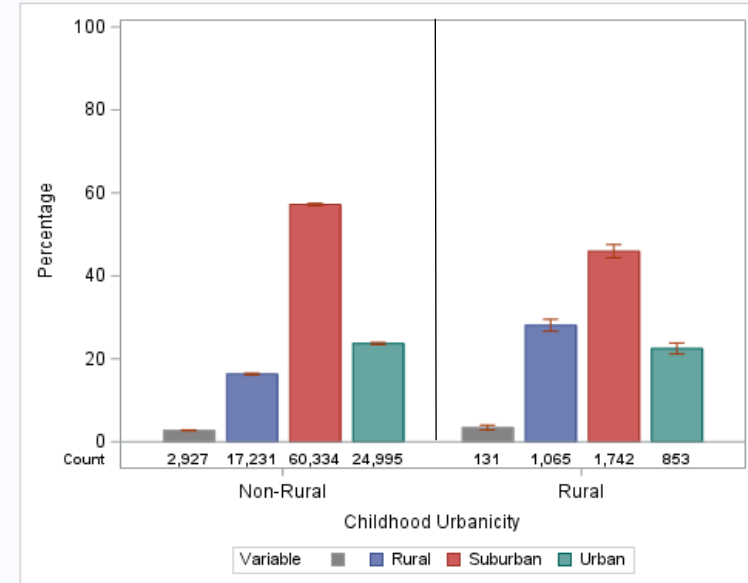
URiM

Childhood Urbanicity

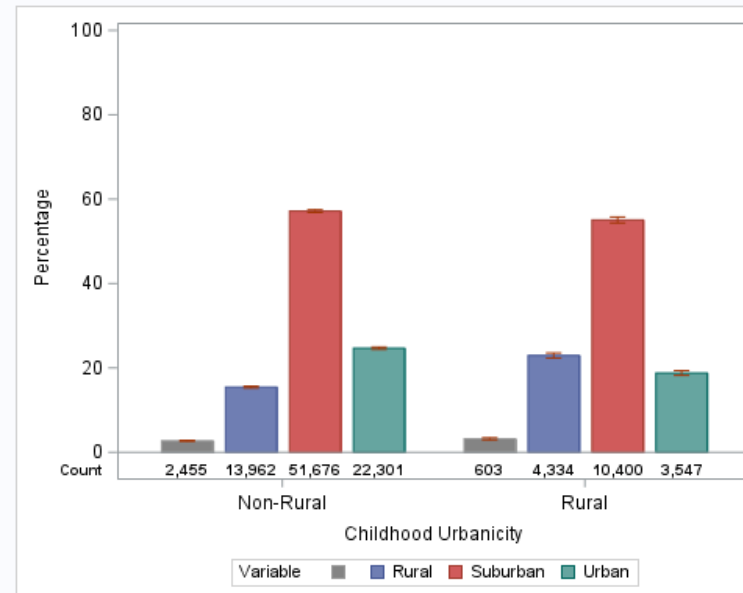
Rural Program Ranked First by Childhood Urbanicity



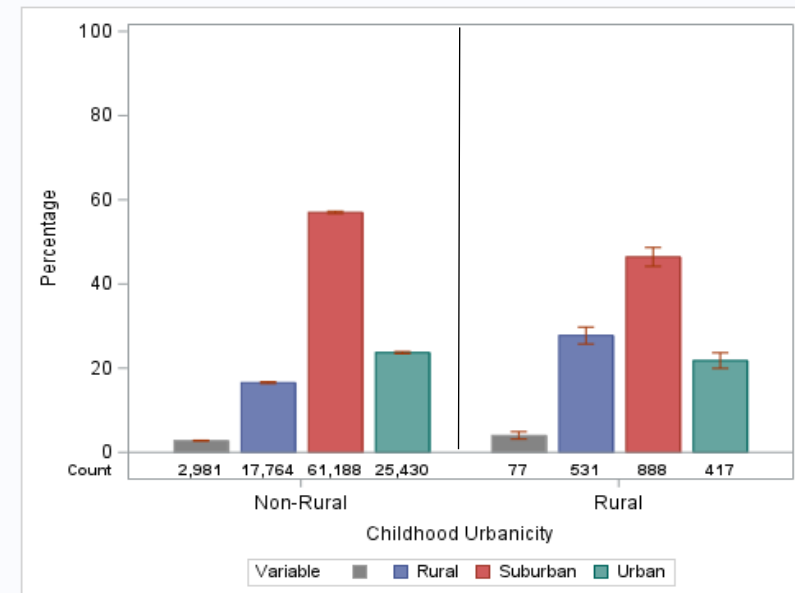
Rural Program Ranked in Top 3 by Childhood Urbanicity



Rural Program on ROL by Childhood Urbanicity

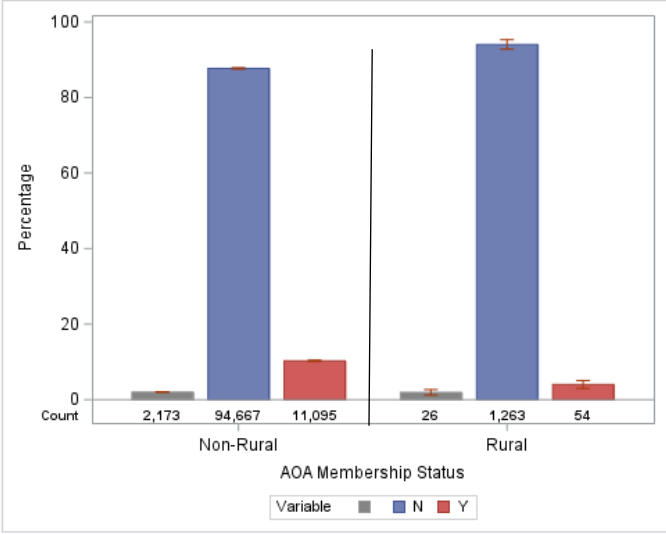


Matched to a Rural Program by Childhood Urbanicity

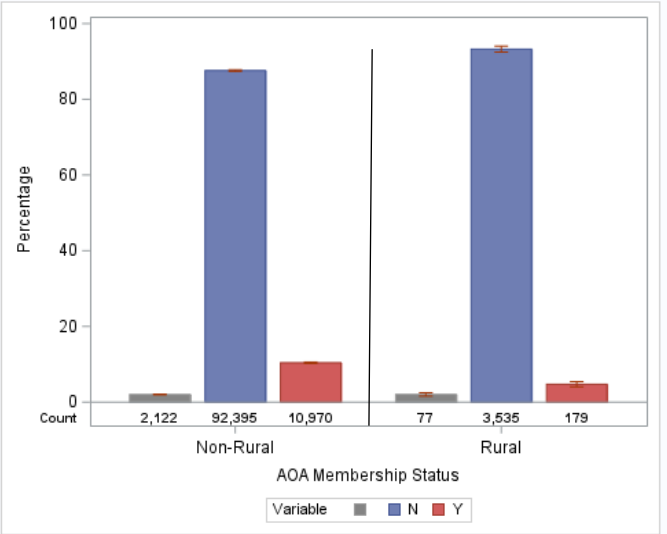


AOA

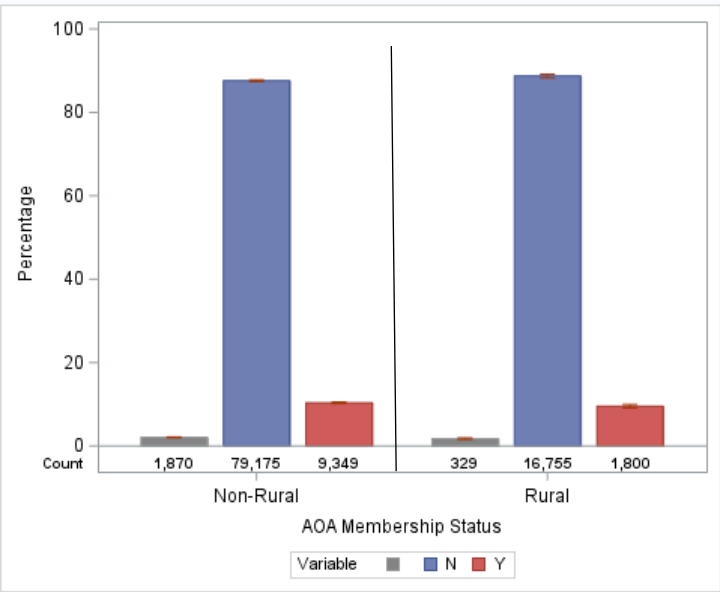
Rural Program Ranked First by AOA Membership Status



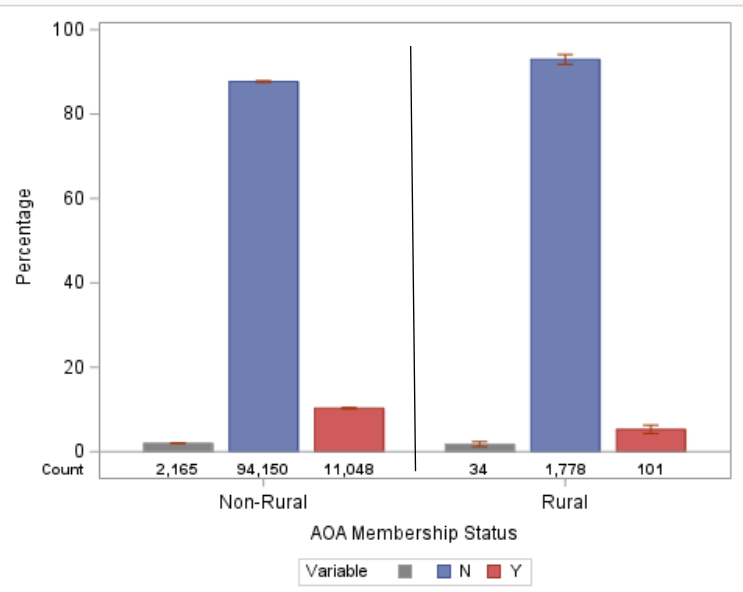
Rural Program Ranked in Top 3 by AOA Membership Status



Rural Program on ROL by AOA Membership Status

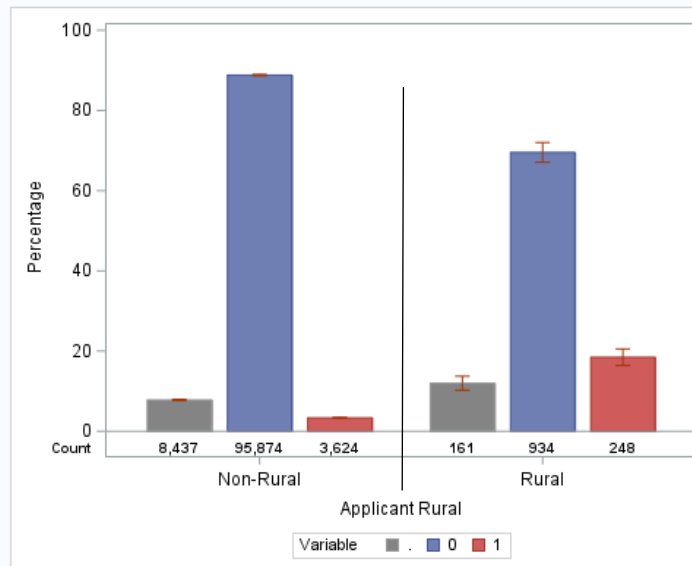


Matched to a Rural Program by AOA Membership Status

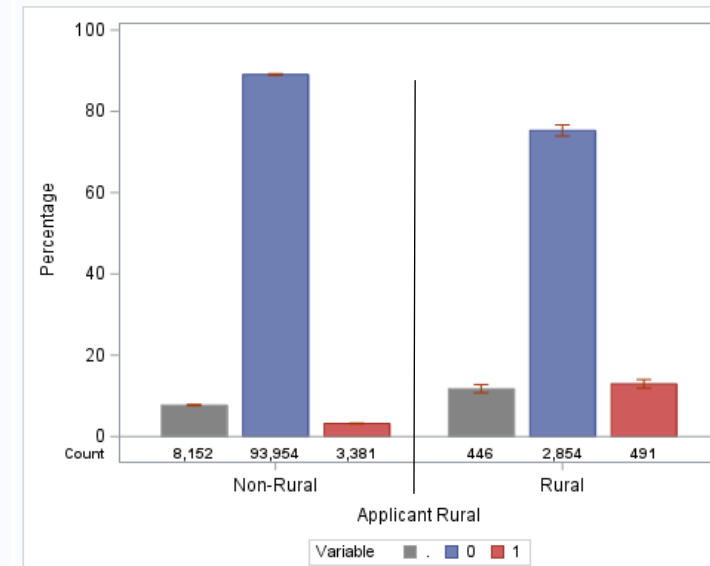


Applicant Rurality

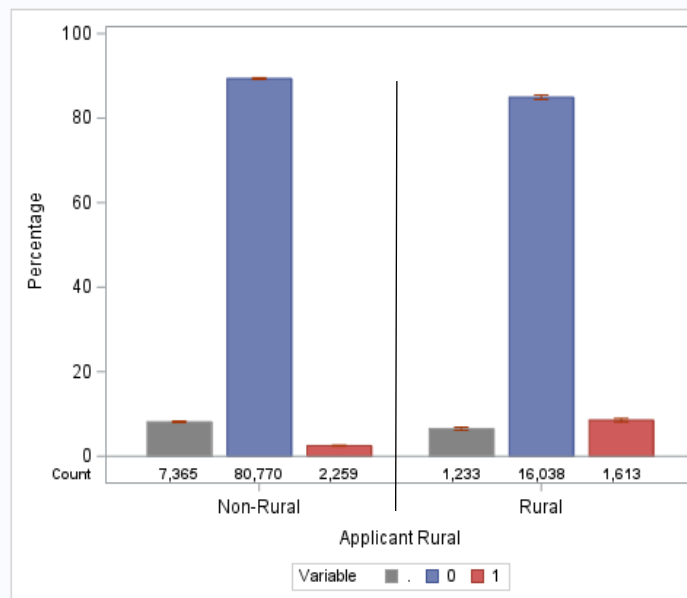
Rural Program Ranked First by Applicant Rural



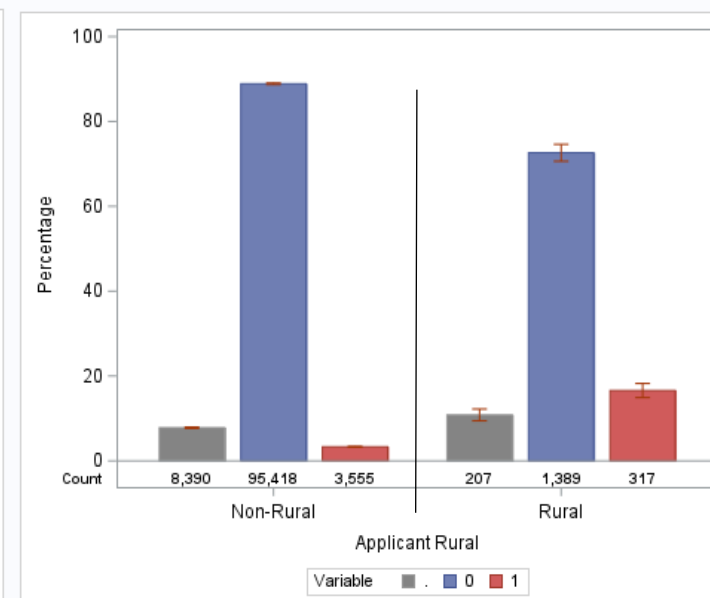
Rural Program Ranked in Top 3 by Applicant Rural



Rural Program on ROL by Applicant Rural



Matched to a Rural Program by Applicant Rural



Continuous Variables

Rural First

Top 3 on ROL

Non-Rural

Rural

Non-Rural

Rural

Variable	Mean	Median	Missing	Mean	Median	Missing	Mean	Median	Missing	Mean	Median	Missing
Volunteer Experiences	5.7	5	13,278	5.2	4	172	5.7	5	12,967	5.3	4	483
Research Experiences	3.2	3	13,944	2.5	2	189	3.2	3	13,589	2.7	2	544
Abstracts / Presentations/ Publications	6.9	4	14,568	5.2	3	191	6.9	4	14,209	5.4	3	550
Work Experiences	3.3	3	13,244	3.9	3	173	3.3	3	12,938	3.7	3	479
Step 2 CK	247	248	15,049	239	240	360	247	248	14,468	241	241	941
Level 2	557	550	87,058	529	519	969	558	551	85,236	530	519	2,769

Continuous Variables – Anywhere on ROL

Rural Ranked on ROL	Non-Rural (N=90,394)			Rural (N=18,884)		
Variable	Mean	Median	N Missing	Mean	Median	N Missing
Volunteer Experiences	5.7	5	11,240	5.8	5	2,210
Research Experiences	3.2	3	11,716	3.0	2	2,417
Abstracts	7.0	4	12,271	6.2	4	2,488
Work Experiences	3.3	3	11,204	3.3	3	2,213
Step 2 CK	247	248	11,197	245	246	4,212
Level 2	563	557	74,384	537	526	13,643

Continuous Variables – Matched Rural

Matched Rural	Non-Rural (N=107,363)			Rural (N=1,913)		
Variable	Mean	Median	N Missing	Mean	Median	N Missing
Volunteer Experiences	5.7	5	13,200	5.3	4	250
Research Experiences	3.2	3	13,854	2.7	2	279
Abstracts	6.9	4	14,463	5.6	3	296
Work Experiences	3.3	3	13,172	3.8	3	245
Step 2 CK	247	248	14,913	240	241	496
Level 2	558	550	86,627	522	508	1,398

Key Takeaways – Bivariate Analyses

1

Relatively similar results across the four outcomes.

2

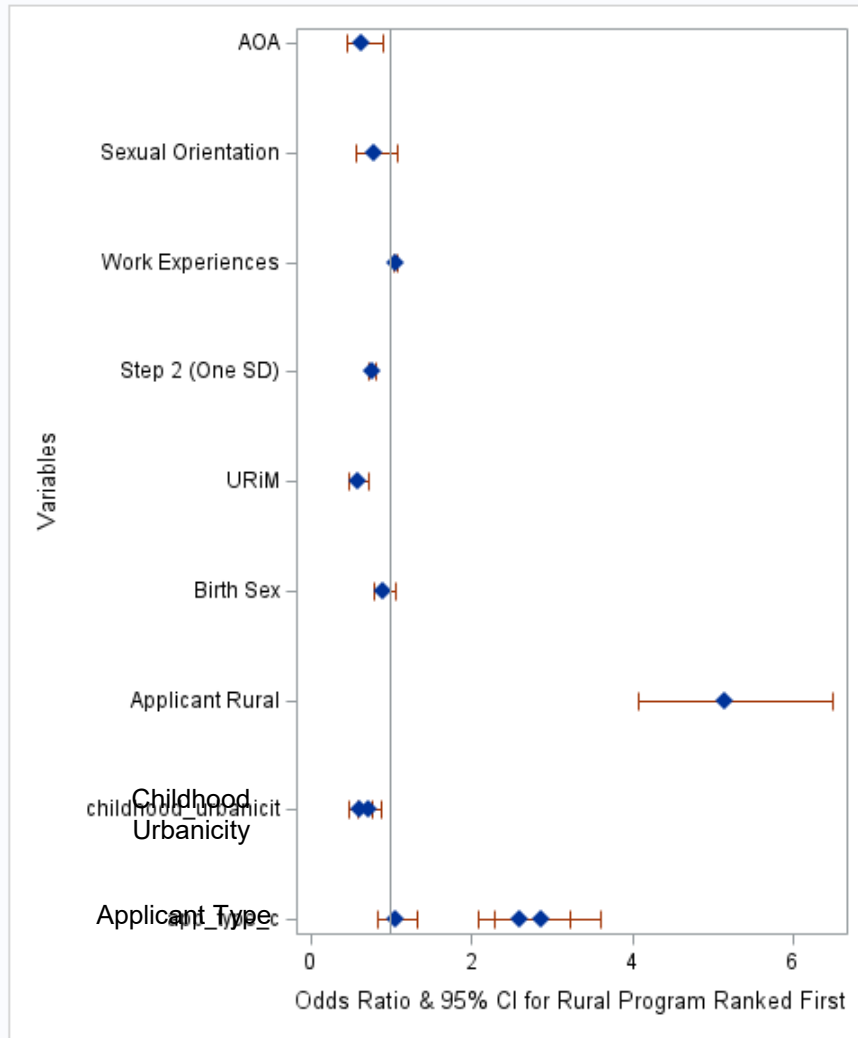
With a few exceptions (e.g., applicant type, childhood urbanicity, applicant rurality) most of the differences between the non-rural and rural graphs are relatively *small*.

3

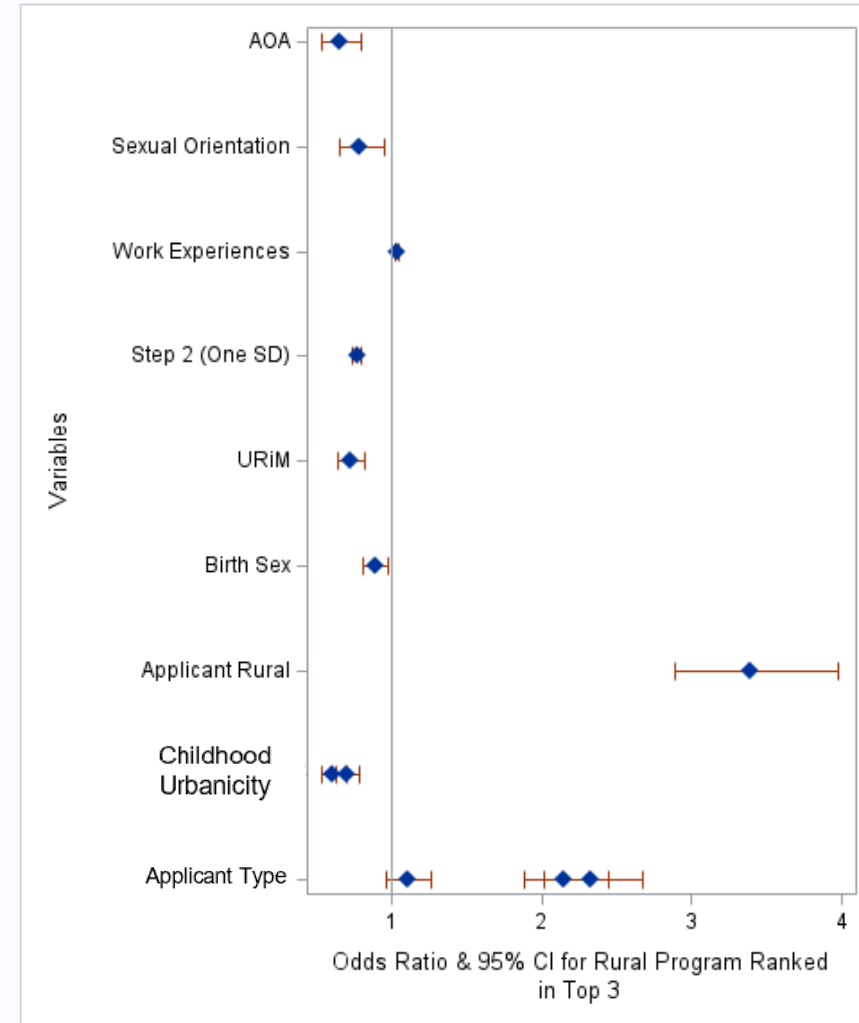
For the continuous variables, overall lower mean values for applicants ranking or matching to rural programs for all variables (e.g., research, abstract, volunteer, step 2, level 2) **except** work experiences.

Regression – Rural First & Top 3 ROL

Forest Plot of Odds Ratios for Rural Program Ranked First

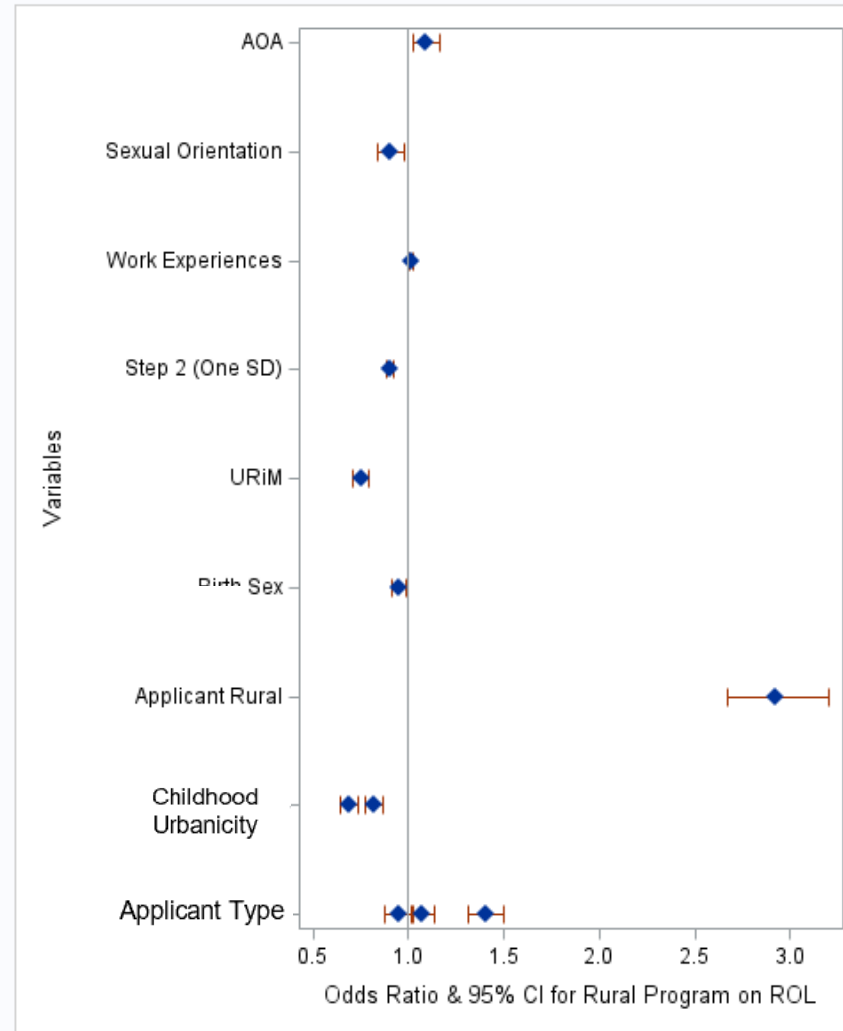


Forest Plot of Odds Ratios for Rural Program Ranked in Top 3



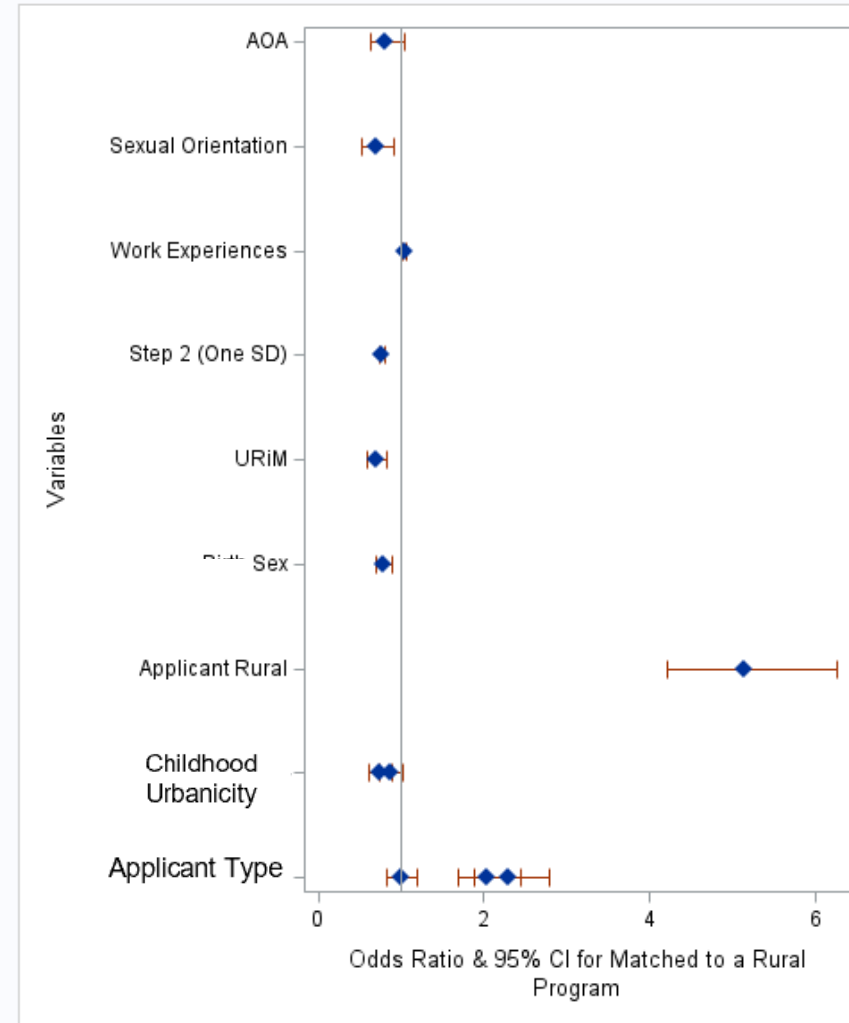
Regression – Anywhere on ROL

Forest Plot of Odds Ratios for Rural Program on ROL



Regression – Matched Rural

Forest Plot of Odds Ratios for Matched to a Rural Program



Key Takeaways – Regressions



Negative predictors (i.e., applicants with these characteristics have lower odds of matching to and/or ranking rural programs):

URiM applicants, sexual orientation (minority applicants), childhood urbanicity (suburban and urban childhoods), sex (female), AOA membership, higher Step 2 CK performance



Positive predictors (i.e., applicants with these characteristics have higher odds of matching to and/or ranking rural programs):

Applicant rurality (rural applicants), applicant type (non-US and US IMGs except for “anywhere on ROL”), more work experiences, & AOA membership (“anywhere on ROL”)



Discussion

- **Consistent Findings Across Outcomes:** Results were largely similar across all four outcomes (ranked #1, ranked top 3, anywhere on ROL, matched). Differences were most notable for “ranked a rural program anywhere on the ROL.”
- **Key Predictors:**
 - Positive: Rural background, IMG status, and more work experiences increased odds of ranking/matching to rural programs, AOA membership
 - Negative: Female sex, URiM status, sexual minority status, urban/suburban childhood, AOA membership, and higher Step 2 CK scores were associated with lower odds.
- **Continuous Variables:** Applicants ranking/matching to rural programs had lower means in research, abstracts/presentation/publications, volunteer, Step 2, except for work experiences.

Limitations & Conclusions

- **Limitations**

- Self-reported data
- RUCA codes – applicant zip code from what they put in R3
- Low number of applicants applying to rural programs
 - Small number of rural programs/tracks
- Sample restrictions
- Small cell sizes for Applicant Rurality
- Cross-sectional design

- **Overall Interpretation:** Rurality of background and professional experiences are stronger predictors of rural residency ranking & matching behaviors than traditional academic metrics.

Small Group Discussion

Facilitating small group activities where participants brainstorm interventions to address rural physician workforce shortages and share their ideas with the larger group for discussion (for 6 groups):

1. Would loan forgiveness and financial incentives be enough to sustain the rural physician pipeline? Why or why not?

2. How might new models of care like telehealth, mobile clinics, or AI-driven decision support shift the balance in rural physician workforce needs?

3. Are their facilitating factors or barriers to medical schools and/or residency programs to create more dedicated “rural medical tracks” that guarantee training and practice opportunities in underserved areas?

4. How do we balance physician well-being and autonomy with the urgent health needs of rural populations?

5. What role can urban physicians and academic centers play in supporting their rural counterparts?

6. What can the GME community research next in relation to rural residency?



Questions?

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Appendix – References

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