Rethinking the Value of Rural Residency Training: What Are Appropriate Indicators and How Do Rural Programs Perform?

RTT Collaborative Annual Meeting – April 8, 2021

Davis Patterson, PhD
University of Washington School of Medicine

Lars Peterson, MD, PhD
American Board of Family Medicine

David Schmitz, MD
University of North Dakota School of Medicine

Rural PREP
Preparing for rural practice

Funding acknowledgment and disclaimer

This research was supported by the Bureau of Health Workforce (BHW), Health Resources and Services Administration (HRSA), U.S. Department of Health and Human Services (HHS) under cooperative agreement #UH1HP29966. The information, conclusions and opinions expressed in this presentation are those of the authors and no endorsement by BHW, HRSA, or HHS is intended or should be inferred.

Rural PREP
Preparing for rural practice

Collaborative for **Rural** Primary care **R**esearch, **E**ducation, and **P**ractice

...to improve and sustain rural health through community engagement and research in rural primary care health professions education.

Study team

Davis Patterson*
Samantha Pollack*
Holly Andrilla*
Andrew Jopson*
David Evans*
Lars Peterson†
Zachary Morgan†
Randall Longenecker‡
David Schmitz§

*University of Washington School of Medicine
†American Board of Family Medicine
‡Ohio University Heritage College of Osteopathic Medicine
§University of North Dakota School of Medicine & Health Sciences

Rural PREP
Preparing for rural practice

Background

- Rural family medicine residencies have been more successful at producing rural physicians.
- Policy context:
  - The Federal Office of Rural Health Policy is investing in rural residencies (Rural Residency Planning and Development Program)
  - New legislation to create more rural training tracks
- Rural programs are often smaller (<4 residents/year), with fewer resources (vs. urban): questions about quality.
- Anecdotal evidence: rural training offers equal or better value (more individual attention, broader scope).

Rural PREP
Preparing for rural practice

“Rural residency” definition

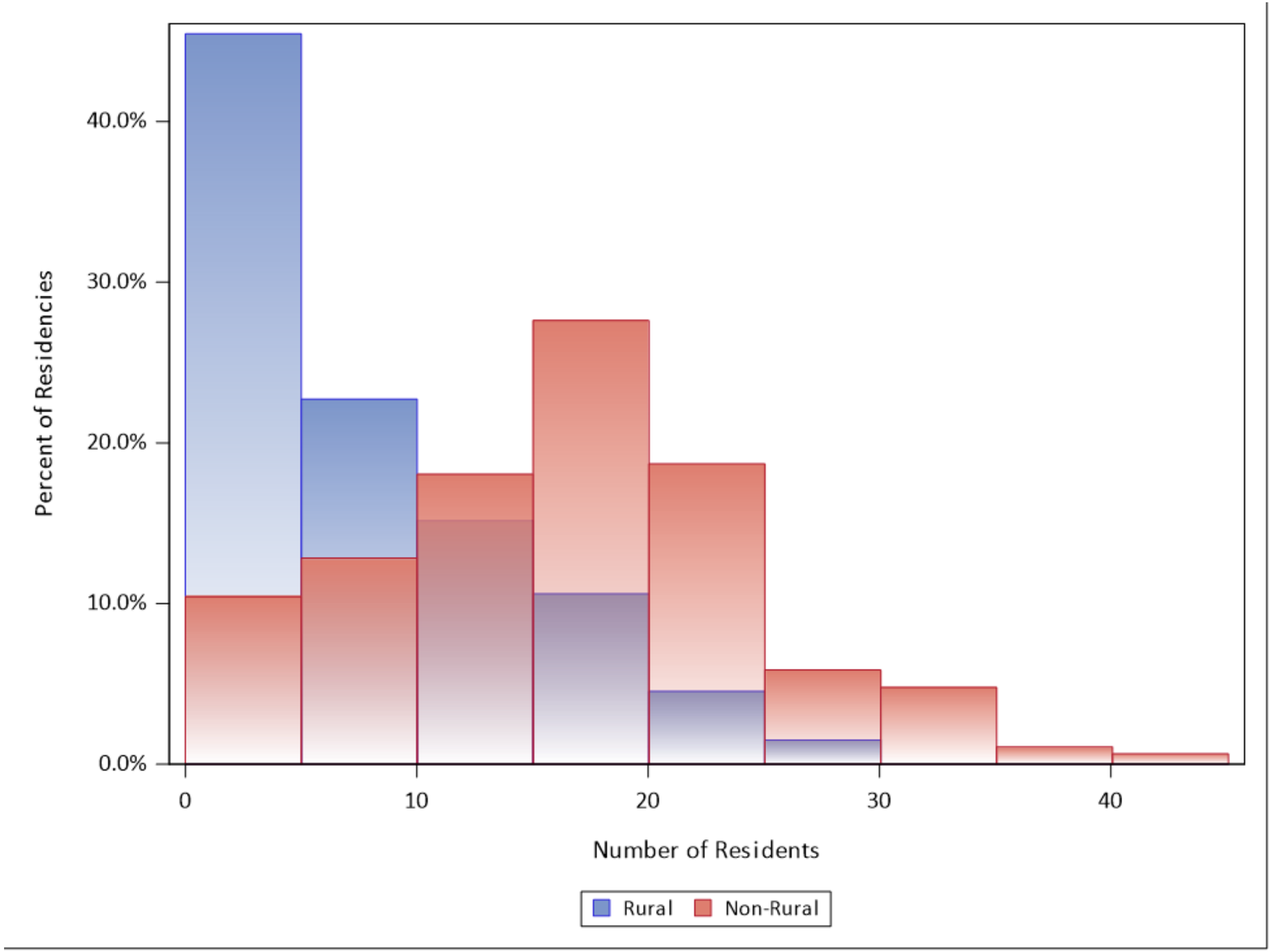
Residency programs where residents spend >50% of time training in a rural location:

https://rttcollaborative.net/rural-programs/

Rural PREP
Preparing for rural practice

Rural Programs Have Fewer Residents than Urban

Total residents in rural vs, non-rural programs (2017-18)



Rural PREP
Preparing for rural practice

Research Goals

Assess measures of value of rural programs in terms of

- training quality
- future practice location (service in rural/under-resourced communities)
- preparedness for practice
- scope of practice

Rural PREP
Preparing for rural practice

Research Questions

1. How do **rural family medicine residents** compare with other residents on **performance** in residency? (controlling for performance at entry)
2. How do **practicing graduates from rural programs** compare with other physicians in practice **location** in rural and underserved settings?
3. How do **practicing graduates from rural programs** compare with other physicians in assessments of residency **preparation for practice** and **subsequent scope of practice**?

Rural PREP
Preparing for rural practice

Methods

Data source: American Board of Family Medicine (ABFM)

- **Family medicine resident** performance:
  - "Milestone" ratings of residents on competency and medical knowledge: 22 competencies in 6 domains, available from 2014-15
  - In-training examination (ITE) scores on medical knowledge
  - Family Medicine Certification Exam

Methods: ABFM survey data

	Certification Examination Registration Questionnaire	National Graduate Survey	Continuing Certification Examination Registration Questionnaire
Shorthand during presentation	Resident	Early-Career	Mid-/Late-Career
Timing	3-4 months prior to examination	Calendar year	3-4 months prior to examination
Cohorts	Residency graduates from that year	3 years after residency graduation (2016 graduates in 2019)	7+ years after residency; regularly returning cohorts
Study variables (all include background/demographics)	• Intended scope of practice • Perceived residency preparation	• Location • Practice characteristics (e.g., scope, type of site) • Preparation for practice	• Location • Practice characteristics (e.g., scope, type of site)

Methods

Analysis: Compare graduates of rural residencies with all others (non-rural), controlling for

- Physician age
- Sex
- MD / DO degree type
- U.S. / international medical graduate (IMG)
- Race/ethnicity: underrepresented in medicine (URM) / non-URM

Rural PREP
Preparing for rural practice

Resident demographics, 2012-19

	Rural	Non-rural
% male*	57%	49%
% <30 years old (n.s.)	46%	48%
% MD* (vs. DO)	63%	72%
% Int'l medical grads*	55%	43%

*p<0.001

Rural PREP
Preparing for rural practice

PART 1

How do **rural family medicine residents** compare with other residents on **performance** in residency?

Rural PREP
Preparing for rural practice

Rural Training and Academic Achievement in Family Medicine

Lars Peterson, MD, PhD
ABFM VP of Research

April 2021

Resident Performance

- Examination
  - In-training Examination (ITE) given in fall of each year
  - Family Medicine Certification Examination (FMCE) taken before graduation
  - Examinations on same scale
  - Reported score is 200 to 800
  - 380 passing score on FMCE
  - No passing score on ITE
- Milestones
  - 22 ratings grouped in 6 core competencies
    - Patient Care
    - Medical Knowledge
    - Systems-Based Practice
    - Practice-Based Learning and Improvement
    - Professionalism
    - Communication
  - 1-5 scale, goal to be Level 4 at graduation
  - Assigned at middle and end of year to each resident

ABFM Certification Examination Content

Cardiovascular	**12%**
Endocrine	**8%**
Gastrointestinal	**7%**
Hematologic/Immune	**3%**
Integumentary	**6%**
Musculoskeletal	**12%**
Nephrologic	**3%**
Neurologic	**3%**
Nonspecific	**9%**
Psychogenic	**7%**
Reproductive—Female	**4%**
Reproductive—Male	**1%**
Respiratory	**13%**
Special Sensory	**2%**
Population-based Care This includes topics such as biostatistics and epidemiology, evidence-based medicine, prevention, health policy and legal issues, bioterror, quality improvement, and geographic/urban/rural issues.	**5%**
Patient-based Systems This includes topics such as clinical decision-making, communication and doctor-patient interaction, family and cultural issues, ethics, palliative care, and end-of-life care.	**5%**

Example Milestone

PROF-2 Demonstrates professional conduct and accountability					
Has not achieved Level 1	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	Presents him or herself in a respectful and professional manner Attends to responsibilities and completes duties as required Maintains patient confidentiality Documents and reports clinical and administrative information truthfully	Consistently recognizes limits of knowledge and asks for assistance Has insight into his or her own behavior and likely triggers for professionalism lapses, and is able to use this information to be professional Completes all clinical and administrative tasks promptly Identifies appropriate channels to report unprofessional behavior	Recognizes professionalism lapses in self and others Reports professionalism lapses using appropriate reporting procedures	Maintains appropriate professional behavior without external guidance Exhibits self-awareness, self-management, social awareness, and relationship management Negotiates professional lapses of the medical team	Models professional conduct placing the needs of each patient above self-interest Helps implement organizational policies to sustain medicine as a profession
☐	☐	☐	☐	☐	☐

Comments:

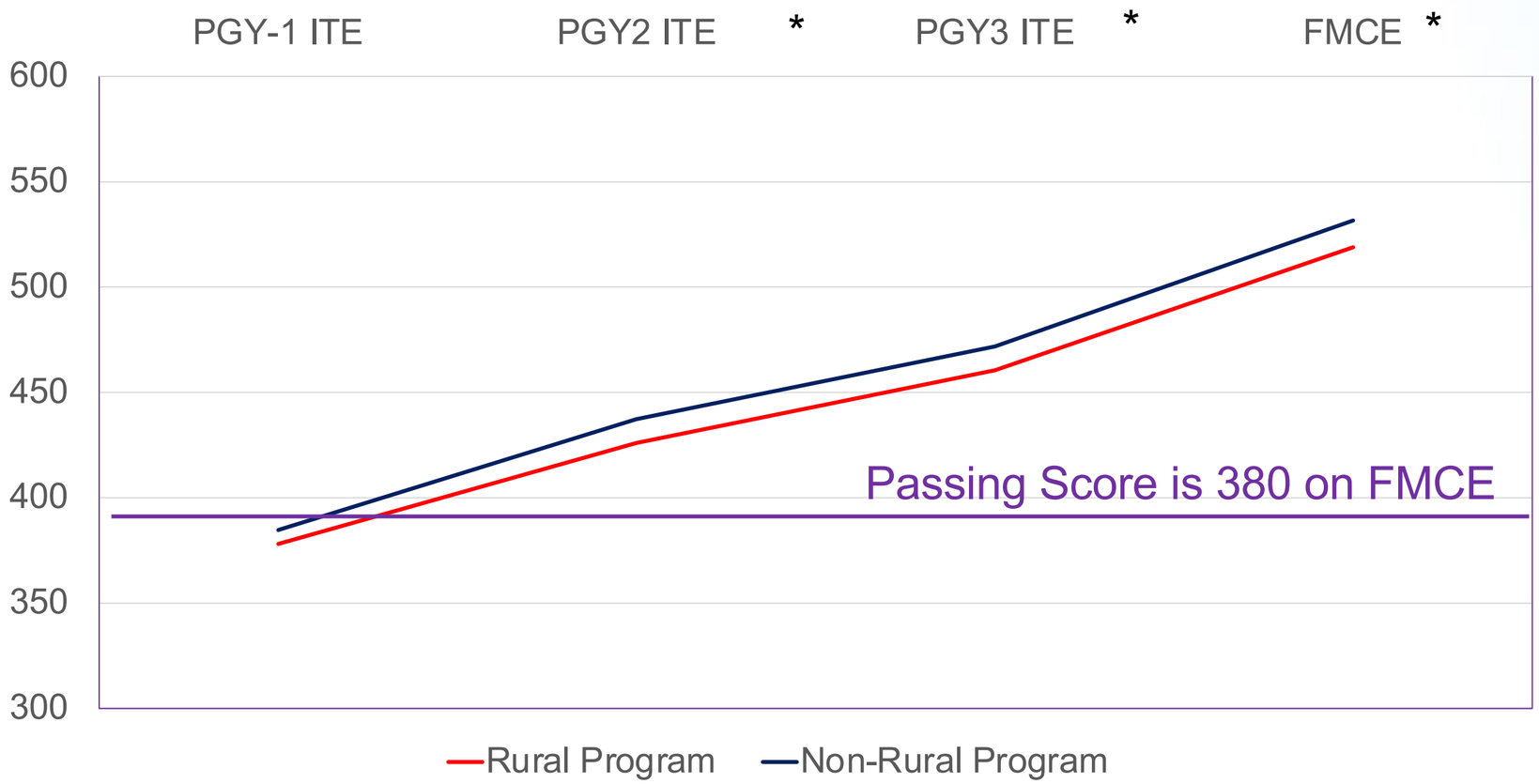
Analytic Plan - Examination

- Plotted scores rural vs. non-rural
- Bivariate comparisons
- 2 Multilevel regressions
  - –FMCE score + FMCE result (failure as outcome)
  - –Control for resident and residency characteristics
  - –Main exposure is rural program

Analytic Plan Milestones

- Calculated **percent of graduates** meeting milestones at each rating and **percent of milestones** met or exceeded at each level overall and by core competency
  - All milestones
  - 6 core competencies
    - Patient Care
    - Medical Knowledge
    - Systems-Based Practice
    - Practice-Based Learning and Improvement
    - Professionalism
    - Communication
- Additionally, 7 milestones were identified by rural educators as likely that rural residents will do better

ITE to FMCE Performance



* P value <0.05

Adjusted Associations with FMCE Score

Resident Characteristics			Residency Characteristics	
Age 35 or Older	-12.9*		Rural Program	-2.1
Female	-3.7*		Small Program (<4 per year)	-13.3*
DO	-27.7*		Medium Program (4-10 per year)	-3.1*
IMG	-41.7*			
Under-represented race/ethnicity	-28.8*			

Interaction terms between rural program and examination instance were non-significant
*P value <0.05

FMCE (Initial Certification) Pass Rate

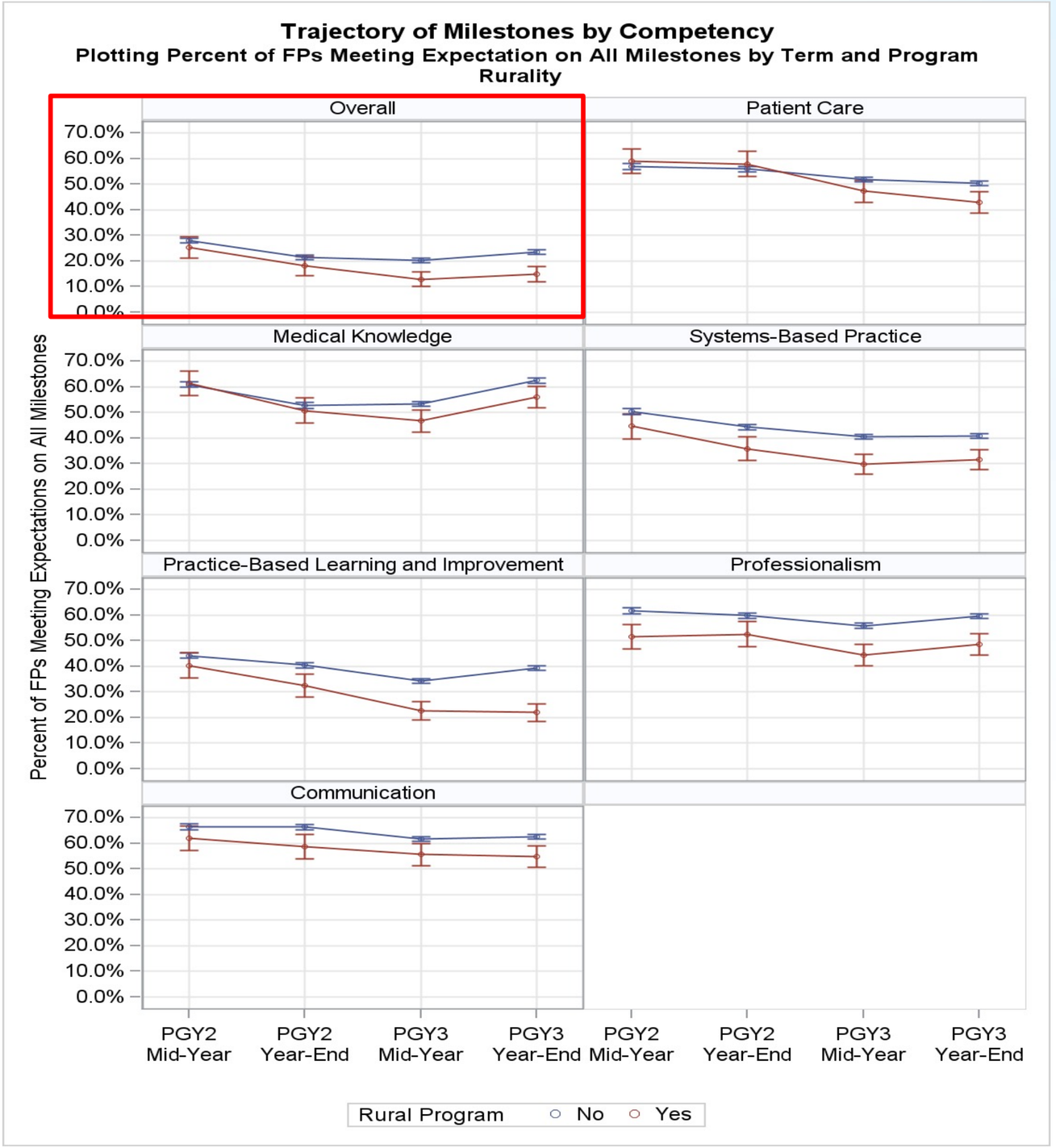
	Rural Program		**Non-Rural** Program		Total	
	N	Percent	N	Percent	N	Percent
Passed	529	96.2%	11,121	98.9%	11,650	98.8%
Did Not Pass	21	**3.8%**	119	**1.1%**	140	1.2%

Adjusted Odds of Failing Exam

Resident Characteristics			Residency Characteristics	
Age 35 or Older	2.09*		Rural Program	3.32*
Female	0.65*		Small Program (<4 per year)	1.66
DO	2.39*		Medium Program (4-10 per year)	0.70
IMG	2.78*			
Under-represented race/ethnicity	1.94*			

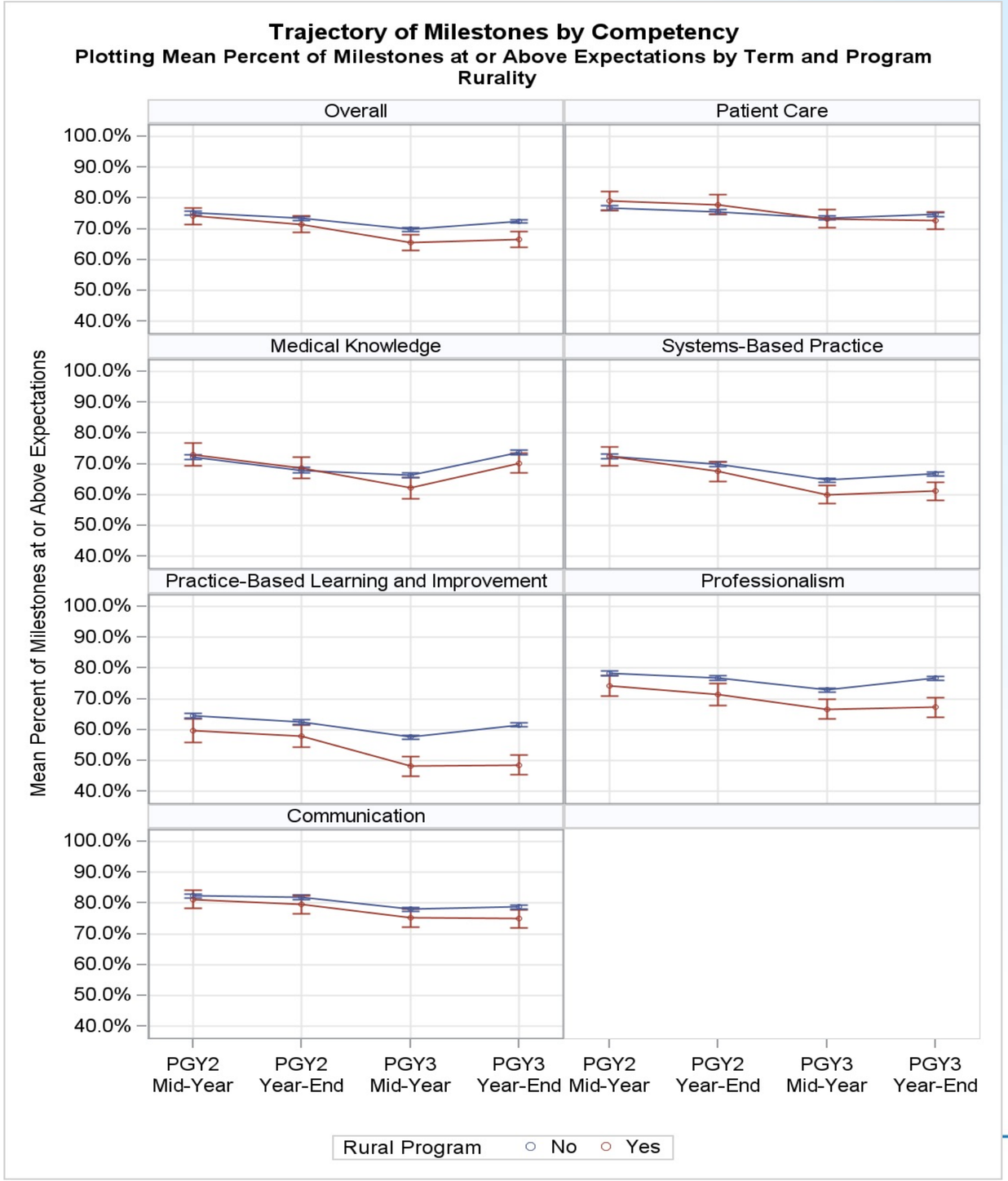
*P value <0.05

Percent of residents meeting expectations **on all milestones** is low, less than 30% at each rating

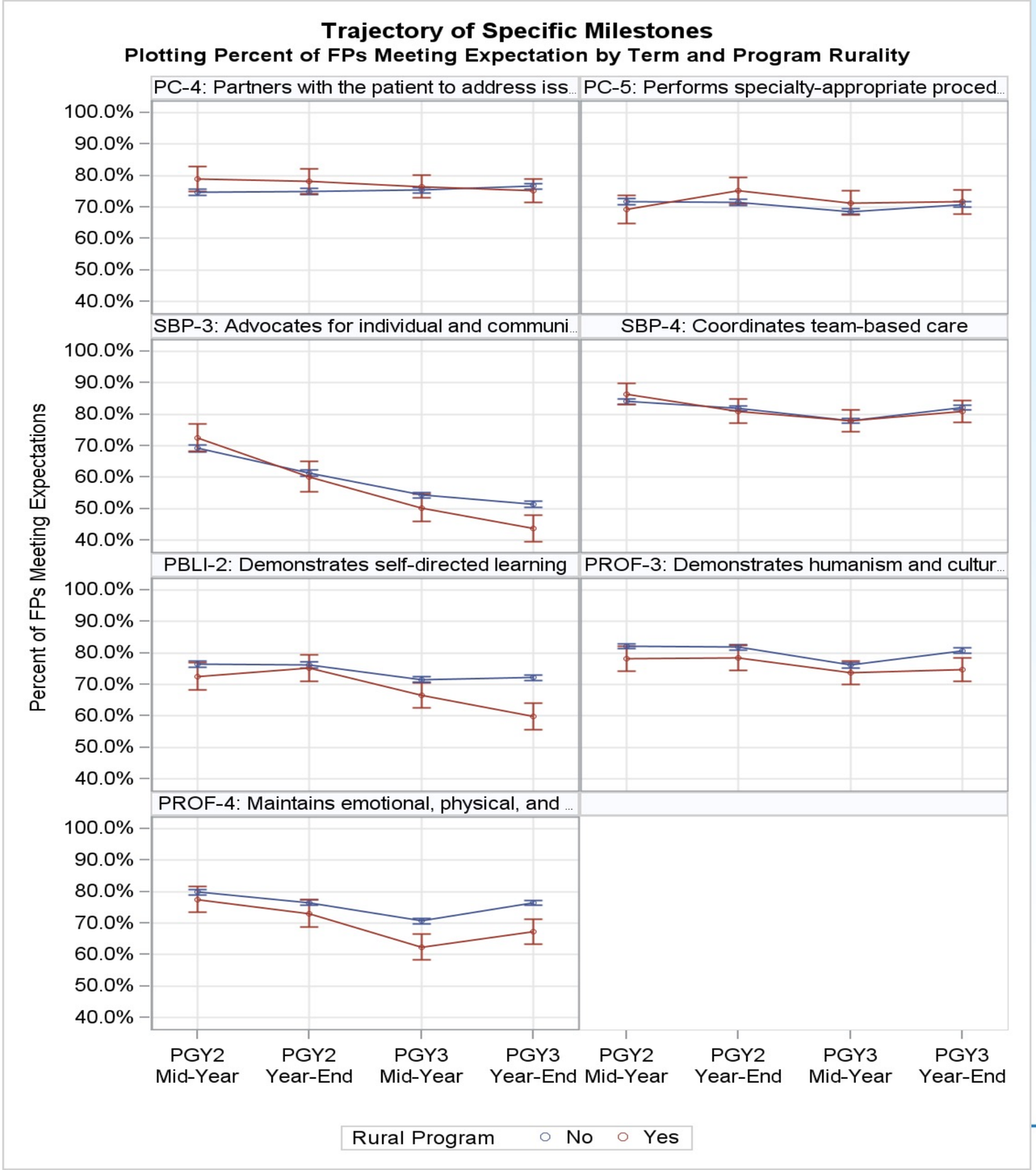


Percent of **milestones at expected level** has small differences between rural and urban programs

- 2 to 13% difference, which at the large end represents a resident not meeting 1 of 2-5 milestones in a core competency



Rural Graduates less likely to meet expectations on 4 of 7 specific milestones



Discussion

- Graduates of rural FM programs have slightly lower passing rates on the ABFM initial certification exam (3%)
- Growth in scores from first year to certification exam is equal in rural and urban programs
- DOs and IMGs (both more common in rural programs) have lower scores and higher odds of failing the exam
- Small differences seen on milestones rates but, clinical significance of differences are unclear

PART 2

How do **graduates from rural residencies** compare with other physicians in practice **location** in rural and under-resourced settings?

- **National Graduate Survey, 2016-2018:** Early-career board-certified physicians, 3 years after residency graduation
- **Continuing Certification Examination Registration Questionnaire, 2014-2018:** Mid-/late-career, 7+ years after initial certification

Rural PREP
Preparing for rural practice

Key Findings:
Rural and Underserved Practice Location

EARLY-CAREER N=6,483	Rural Program Graduates	Urban Program Graduates
n	272 (4.2%)	6,211
Underserved Practice Site*	**23%**	**17%**
FQHC	38%	71%
RHC	57%	24%
IHS	4%	6%
Rural Location (RUCA≥4)***	**51%**	**17%**

*p<0.05
***p<0.001

Rural PREP
Preparing for rural practice

Key Findings:
Rural and Underserved Practice Location

MID-/LATE-CAREER N=44,325	Rural Program Graduates	Urban Program Graduates
n	1,274 (2.8%)	43,051
Underserved Practice Site***	**14%**	**9%**
FQHC	38%	66%
RHC	56%	27%
IHS	6%	7%
Rural Location (RUCA≥4)***	**53%**	**18%**

***p<0.001

Rural PREP
Preparing for rural practice

Key Findings: Multivariate Analyses

Rural vs. Urban Program Graduates	Early-Career	Mid-/Late-Career
Adjusted Odds Ratio of Choosing Rural Practice	**5.5*** **	**5.3*** **
AOR of Choosing Underserved Practice Site	**1.6** **	**1.8*** **

**p<0.01
***p<0.001

Rural PREP
Preparing for rural practice

PART 3

How do **practicing graduates from rural residencies** compare with others in self-reported assessments of residency **preparation for practice** and **scope of practice**?

- **National Graduate Survey, 2016-2018:** Early-career board-certified physicians, 3 years after residency graduation

Rural PREP
Preparing for rural practice

Early-Career Physicians, 2016-2018 (N=6,483)

	Rural Program Graduates	Urban Program Graduates
n	272	6,211
Mean age (years)	36.1	35.9
% female*	**50%**	**57%**
% MD (vs. DO)	85%	83%
% IMGs***	**44%**	**34%**

*p<0.05 ***p<0.001

Rural PREP
Preparing for rural practice

Outcome: “Whether or not your residency training adequately prepared you for your practice” (yes/no)

30 Subject Areas/Procedures:

Care of Children
- Pediatric outpatient care
- Newborn hospital care
- Pediatric hospital care
- Neonatal circumcision

Hospital Based Care*
- Intensive care
- Lumbar puncture
- Intubation
- Ventilator management
- Central line placement
- Thoracentesis

Women’s Health
- Maternity care
- Endometrial biopsy
- IUD insertion and removal
- Implantable LARC
- Colposcopy
- Uterine aspiration/D&C
- Pregnancy termination
- Basic OB ultrasound

Musculoskeletal Services
- Casting
- Joint aspiration and injection
- Musculoskeletal ultrasound

Miscellaneous Services/Procedures
- Vasectomy
- Cardiac stress test
- Osteopathic manipulative treatment
- Buprenorphine treatment
- (pharmacologic) HIV/AIDS management
- (pharmacologic) Hepatitis C management
- End of life care
- Behavioral health care
- Integrative health care/CAM

*Only asked of physicians providing inpatient care.

Rural PREP
Preparing for rural practice

Bivariate Analyses:
Perceived Residency Preparedness

Care of Children

- Pediatric outpatient care
- Newborn hospital care
- Pediatric hospital care**
- Neonatal circumcision**

Hospital Based Care

- Intensive care***
- Lumbar puncture*
- Intubation***
- Ventilator management*
- Central line placement**
- Thoracentesis***

Women's Health

- Maternity care
- Endometrial biopsy*
- IUD insertion and removal
- Implantable LARC
- Colposcopy*
- Uterine aspiration/D&C
- Pregnancy termination
- Basic OB ultrasound

Musculoskeletal Services

- Casting***
- Joint aspiration and injection
- Musculoskeletal ultrasound

Miscellaneous Services/Procedures

- Vasectomy
- Cardiac stress test**
- Osteopathic manipulative treatment**
- Buprenorphine treatment
- (pharmacologic) HIV/AIDS management**
- (pharmacologic) Hepatitis C management
- End of life care*
- Behavioral health care
- Integrative health care/CAM

*p<0.05
**p<0.01
***p<0.001

Rural PREP
Preparing for rural practice

Multivariate Analyses:
Perceived Residency Preparedness

Care of Children

- Pediatric outpatient care
- Newborn hospital care
- Pediatric hospital care
- Neonatal circumcision

Hospital Based Care

- Intensive care**
- Lumbar puncture*
- Intubation**
- Ventilator management*
- Central line placement**
- Thoracentesis**

Women's Health

- Maternity care
- Endometrial biopsy*
- IUD insertion and removal
- Implantable LARC
- Colposcopy*
- Uterine aspiration/D&C
- Pregnancy termination
- Basic OB ultrasound

Musculoskeletal Services

- Casting***
- Joint aspiration and injection
- Musculoskeletal ultrasound

Miscellaneous Services/Procedures

- Vasectomy
- Cardiac stress test
- Osteopathic manipulative treatment*
- Buprenorphine treatment
- (pharmacologic) HIV/AIDS management***
- (pharmacologic) Hepatitis C management*
- End of life care*
- Behavioral health care
- Integrative health care/CAM

*p<0.05
**p<0.01
***p<0.001

Rural PREP
Preparing for rural practice

Bivariate Analyses :
Currently Practicing

Care of Children

- Pediatric outpatient care
- Newborn hospital care
- Pediatric hospital care**
- Neonatal circumcision

Hospital Based Care

- Intensive care***
- Lumbar puncture
- Intubation***
- Ventilator management**
- Central line placement
- Thoracentesis

Women's Health

- Maternity care
- Endometrial biopsy
- IUD insertion and removal**
- Implantable LARC**
- Colposcopy
- Uterine aspiration/D&C
- Pregnancy termination
- Basic OB ultrasound

Musculoskeletal Services

- Casting*
- Joint aspiration and injection
- Musculoskeletal ultrasound

Miscellaneous Services/Procedures

- Vasectomy
- Cardiac stress test
- Osteopathic manipulative treatment
- Buprenorphine treatment
- (pharmacologic) HIV/AIDS management
- (pharmacologic) Hepatitis C management
- End of life care***
- Behavioral health care
- Integrative health care/CAM

*p<0.05
**p<0.01
***p<0.001

Rural PREP
Preparing for rural practice

Multivariate Analyses :
Currently Practicing

Care of Children

- Pediatric outpatient care
- Newborn hospital care
- Pediatric hospital care
- Neonatal circumcision

Hospital Based Care

- Intensive care**
- Lumbar puncture*
- Intubation
- Ventilator management
- Central line placement
- Thoracentesis*

Women's Health

- Maternity care*
- Endometrial biopsy
- IUD insertion and removal*
- Implantable LARC*
- Colposcopy
- Uterine aspiration/D&C
- Pregnancy termination
- Basic OB ultrasound

Musculoskeletal Services

- Casting
- Joint aspiration and injection*
- Musculoskeletal ultrasound*

Miscellaneous Services/Procedures

- Vasectomy
- Cardiac stress test
- Osteopathic manipulative treatment
- Buprenorphine treatment
- (pharmacologic) HIV/AIDS management
- (pharmacologic) Hepatitis C management
- End of life care*
- Behavioral health care
- Integrative health care/CAM

*p<0.05
**p<0.01
***p<0.001

Rural PREP
Preparing for rural practice

Overall Scope of Practice Scores

- Validated scale of scope items, 0-30
- 0 = not currently practicing, higher score = broader scope

	n	Rural	Urban
Early-career*	5,334	16.5	16.1
Mid-/Late-career***	37,233	15.7	14.7

*p<0.05

***p<0.001

Rural PREP
Preparing for rural practice

Conclusions

1. **Resident Performance**
   - Graduates of rural FM programs have slightly lower passing rates on the ABFM initial certification exam (3%).
   - Growth in scores from first year to certification exam is equal in rural and urban programs.
   - DOs and IMGs (both more common in rural programs) have lower scores and higher odds of failing the exam.
   - Small differences seen on milestones rates, but clinical significance of differences is unclear.

Rural PREP
Preparing for rural practice

Conclusions

2. Location in Rural and Under-resourced Sites

- Over half of rural program graduates chose rural practice, roughly three times the yield from urban programs.
- Rural programs produced higher proportions of physicians serving under-resourced patients.
- These patterns were remarkably stable at different career stages.

Rural PREP
Preparing for rural practice

Conclusions

3. Residency Preparation and Scope of Practice

- Rural program graduates more often rated themselves prepared by their programs in several hospital care measures but less prepared in some women's health measures.
- Rurally trained mid-/late-career physicians, but not early-career physicians, reported a broader scope of practice than their urban program counterparts.

Rural PREP
Preparing for rural practice

Discussion and Implications

Based on these findings, what value do rural vs. urban family medicine residency programs provide?

- What is the clinical significance of differences in Milestone ratings?
- How important is the difference in board exam pass rates?
- How do we assess the differences between rural and urban programs in practice location outcomes (rural, under-resourced communities)?

What are physician workforce policy implications?

- Do these results provide support for current efforts to establish more rural programs?
- What more needs to be done to support rural training?

Rural PREP
Preparing for rural practice

Discussion and Implications

- Are these suitable measures of success, and if not, what are appropriate indicators?
- What more do we need to know?

Rural PREP
Preparing for rural practice

Contacts

Rural PREP

Davis Patterson, Project Director
davisp@uw.edu

Randall Longenecker, Associate Project Director/Community of Practice Lead
longenec@ohio.edu

David Schmitz, Dissemination Lead
david.f.schmitz@und.edu

American Board of Family Medicine

Lars Peterson, Vice President of Research
lpeterson@theabfm.org

Follow us on social media: @ruralprep
Website: https://ruralprep.org/

Rural PREP
Preparing for rural practice

Thank you for your insights!

Session feedback:

http://bit.ly/RethinkingRuralResidency

Rural PREP

Preparing for rural practice