Contributions of US Medical Schools to Primary Care (2003-14):
Who REALLY Goes into Primary Care?

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Why is this Question Important?

- **Primary care is the backbone of high-quality, accessible, cost-effective healthcare.**

- U.S. is facing an accelerating shortage of primary care physicians.

- We know darn well that **U.S. medical schools exaggerate their primary care physician output** – a practice previously termed "*The Dean's Lie*"

- No useful data is available from AMA, AAMC or other sources on <u>actual</u> primary care output of US medical schools

- The only way to accurately determine the primary care output of recent medical school graduates is tracking them down upon completion of residency and entry into practice.

- Tracking down medical school graduates is difficult; **a less cumbersome method is needed to correct *The Dean's Lie* and to inform workforce planning.**

Research Objectives:

1. To determine the magnitude by which primary care output is overestimated by commonly used metrics.

2. Identify a more accurate method for predicting actual primary care output.

3. Determine the relative contribution of FM, IM and Peds graduates to the primary care physician workforce.

Methods: Participating Medical Schools

- Started as a mentored scholarly study at the University of Colorado School of Medicine in 2015.
  - Results were presented at the NRHA RME meeting in 2016. (Deutchman, Priester and Wills)
  - RME members from several other schools expressed an interest in replicating the study in the form of a multi-institutional collaboration.
  - The NRHA Rural Medical Educator's Group represents a significant number of geographically diverse schools of medicine.

- Faculty from 38 US medical schools were invited to participate.

- A champion co-investigator was needed at each school because names of graduates in specific residency match categories are needed to complete the study.

- 20 campuses from 14 universities participated; all are U.S., MD-granting

Methods: Study Category Definitions

Definitions used at entry into residency after medical school graduation		Definitions used at time of entry into practice after residency completion	
Residency Match Primary Care Method	*Intent to Practice Primary Care Method*	*Actual Primary Care*	*Not Primary Care*
Internal Medicine (Categorical)	Medicine-Primary	Family Medicine	Any Medical or Surgical Subspecialty
Medicine-Primary	Family Medicine	General Internal Medicine	Hospitalist
Family Medicine	Pediatrics-Primary	General Pediatrics	Emergency Medicine
Pediatrics (Categorical)	Medicine-Pediatrics	Medicine-Pediatrics	Urgent Care
Pediatrics-Primary		Geriatrics	Hospice/Palliative Care
Medicine-Pediatrics			

Methods: National Academy of Medicine Definition of Primary Care

- … the provision of integrated, accessible, health care services by clinicians who are accountable for addressing a large majority of personal health care needs, developing a sustained partnership with patients, and practicing in the context of family and community.

Methods: Schools and campuses

All U.S. regions; public and private, distributed across published primary care rankings

- U. Alabama
- Case Western
- Univ. Colorado
- Dartmouth
- East Carolina

- Univ. Illinois
- Anonymous
- Univ. Minnesota
- Univ. Missouri
- Univ. Nevada, Reno

- Univ. N. Carolina
- Oregon Health Sci. U.
- Univ. S. Florida
- Univ. Washington

Methods: Graduate Tracking

- Of 17,509 graduates from 14 medical schools across 20 campuses, 7206 (41%) were classified as "primary care" by the Match PC method
- Medical school graduation years 2003-2014; to allow for time to complete residency and enter practice
- Tracking methods:
  - Doximity
  - Google
    - Individuals
    - Practice descriptions
    - Hospital websites
  - NPI
  - LinkedIn
- Test sample of IM preliminary match graduates to see if any eventually entered primary care rather than subspecializing

Results

- Match PC Method : 41.2%
- Actual PC : 22.3%
- New method 17.1%
- FM is largest contributor to PC workforce

Primary Care by "Match PC" Method ("Dean's Lie") v. Actual
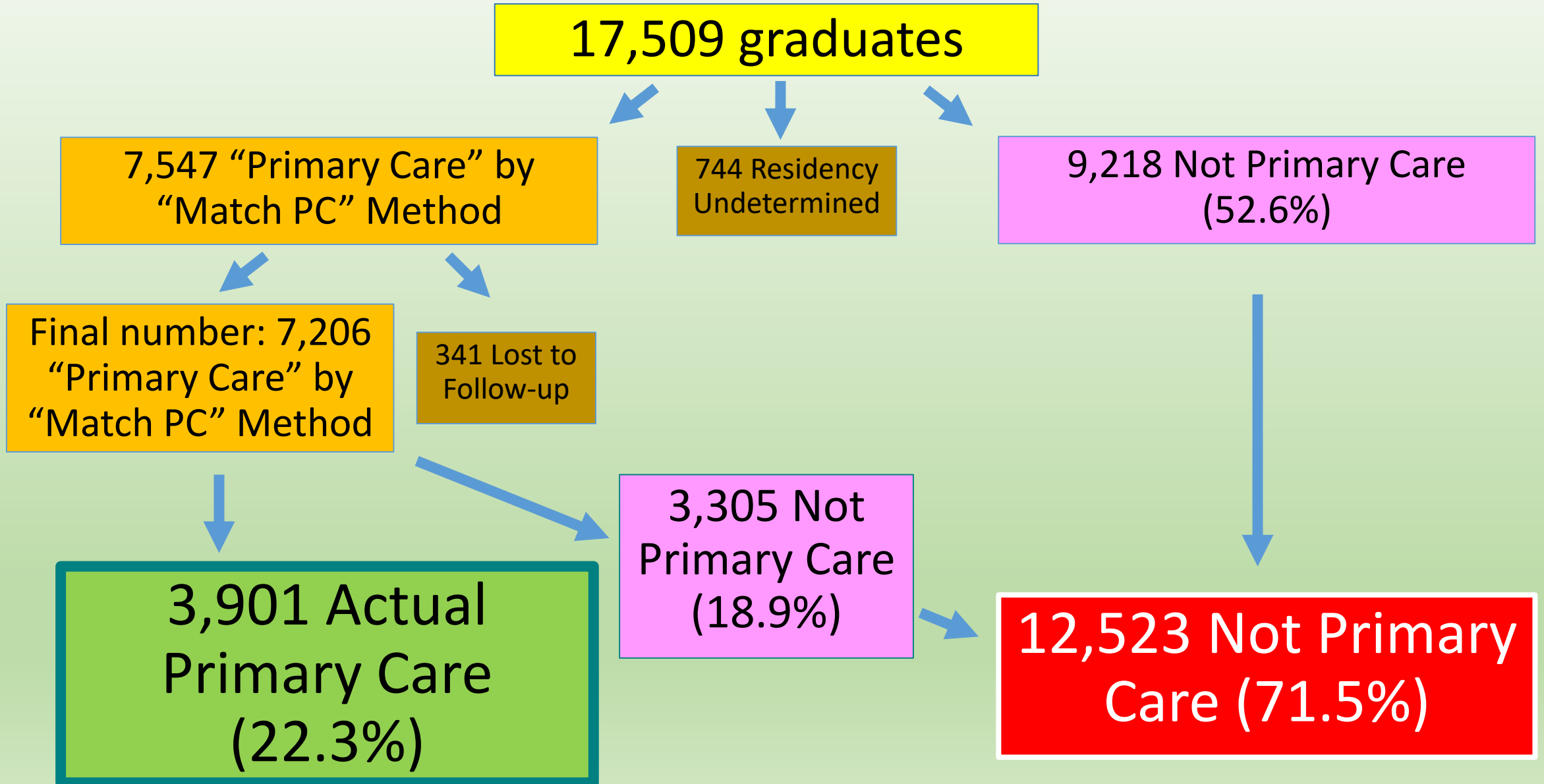
Take-home Message #1

The Match PC method (Dean's Lie) falsely claims primary care by almost double

Detail: Primary Care by Specialty

Match Specialty	Actual Primary Care (7206)	Contribution to Actual Primary Care Workforce (3901)
Family Medicine	**92.8%**	**47.8%** (1866)
Pediatrics Categorical	44.6% to 51.6%	18.4% to 21.3% (718-830)
Internal Medicine Categorical	20.6% to 30%	13.6% to 19.9% (532-775)
Medicine-Pediatrics	61.6%	5.4% (209)
Medicine Primary Care	29.5%	4.5% (176
Pediatrics primary Care	93.5%	1.1% (43)
Medicine – Family Medicine	50%	0.0003% (1)

Take-Home Message #2

Family Medicine is the largest contributor to the M.D. primary care workforce based on the number and percentage of graduates who actually practice primary care after residency completion.

What's a more accurate method of determining primary care output at medical school graduation?

- Intent to practice primary care method ("Intent PC") counts all graduates who match in:
  - Family Medicine residencies
  - Primary Care Internal Medicine residencies
  - Primary Care Pediatrics residencies
  - Med-Peds residencies
- Predicts 17.1% primary care in this sample
  - MUCH closer to the actual primary care rate of 22.3%
  - Can be readily adjusted based on a small sample of any given medical school.

Intent PC Method Advantages

- Rapidly calculated based on basic match data

- Does not require waiting 3 to 4 years and tracking down graduates after they finish residency

- **Intent PC is within 5.2 percentage points of actual (under-count) vs 19 percentage points (over-count) of Match PC method**

- Over-counts for FM, IM Primary and Peds Primary graduates are partly balanced by under-counts of categorical IM and categorical Peds

- Can be adjusted for any specific school with a limited search of IM graduates

How Well Does the Overall Number Yielded by the Intent PC Method Identify ALL of Those Who Actually Practice Primary Care?

- Overall, Intent PC Method predicted that 3001 graduates would practice primary care.

- The Actual PC number was 3901.   3001/3901 = 77% accuracy

- The Intent PC Method missed about 900 graduates who eventually practiced primary care out of the total 17,509 graduates in the study. (5 percentage points)

When the Intent PC Method Indicates That Graduates Will Go Into Primary Care, How Accurate is that Prediction for a Specific School?

- 3 schools: >90% of Intent PC grads actually practiced primary care
- 9 schools: >75% and <90% of Intent PC grads actually practiced primary care
- 2 schools: Intent PC identified only 36.5% and 50% respectively of the grads who actually practiced primary care

Did We Miss Preliminary Year Graduates Who Practice Primary Care or Career Changers?

- A pilot study of University of Colorado preliminary residents found that only 1.4% practiced primary care

- A 10-year analysis at Case Western found that only 1.5% of preliminary residency graduates switched to a primary care residency and eventually practiced primary care.

Intent PC adjustment example: U. Colorado

- 1648 "Match PC" graduates

- Intent PC method predicted 11.4% (188) primary care but Actual rate was **18.6%** (306)

- Study a sample of Categorical IM and Peds residency graduates:
  - Add back 72 (19%) of Categorical IM residency grads in Primary Care
  - Add back the 68 (47%)Categorical Pediatrics residency grads in Primary Care

- 188+72+68/1648 = **20%** which is within 1.4 percentage points of actual

- Further local refinements possible, for example sampling FM grads to determine what % enter urgent care or become hospitalists

Take-home Message #3

The Intent PC Method predicts the primary care output of U.S. MD medical schools much more accurately than the Match PC method and can be readily adjusted for specific schools.

- Intent PC Method: 5.2 percentage points under-estimate
- Match PC Method: 19 percentage points over-estimate

Study Limitations

- We studied only U.S. MD granting schools
- Most schools are public
- Mid-Atlantic/New England schools were under-represented
- Graduate data was obtained from public sources not by personal survey
- Data is a "snapshot in time" that does not account for physicians who enter or leave primary care during the course of their careers
- We had some missing data but imputing missing values to primary care or not primary care changed the proportions by only 2.3%

Future Opportunities

- Use this data to change medical school reporting of their primary care output

- Use this data to impact workforce planning

- Further refinement of the Intent PC Method

- Additional studies based on direct survey of graduates about their scope of care

- Additional studies of a broader geographic sample of schools and schools granting the D.O. degree