

Family Medicine

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| <u>Author, year</u> | <u>Relevant Themes</u> | <u>Methodology</u> | <u>Data Sources</u> | <u>Outcome Variable Studied</u> | <u>Key Findings</u> | <u>Comments</u> |
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| Arnold, 1997 | Applicant Characteristics | Single institution observational study of 327 graduates of University of Missouri-Kansas City (UMKC) School of Medicine; 1983 to 1987 | Graduate survey, UMKC's longitudinal database (graduate characteristics on admission & performance during school), NBME scores | Factors prior to matriculation and during medical school affecting specialty choice in primary care | No demographic variables predicted choosing primary care | Pre-clinical medical school performance, but not clinical performance, was lower among those who entered primary care |
| Ballejos, 2019 | Pre-matriculation Program | Single institution observational study of participants in a combined BA/MD program and peers in MD program; 2009-2014 | Specialty interest survey at orientation, family medicine residency match results (NRMP data), demographic data | Influence of pre-matriculation program on choosing family medicine as specialty choice | Combined BA/MD students matched into family medicine at twice the rate of traditional medical degree students | Studied 172 BA/MD students at University of New Mexico School of Medicine and compared with 172 non-BA/MD similarly matched peers |
| Basco, 1998 | Targeted premedical recruitment | Multiple institution cross-sectional study of 120 medical schools; 1993-1994 | AAMC survey of Generalist Physician Initiatives in 1993 or 1994; AAMC's MSQ in 1994 | Medical school admissions practices and proportions of matriculants interested in primary care | 1/3 of schools report recruiting future generalists. Recruiting for primary care and public ownership were the only associated variables. | No description of the premedical recruiting processes was available |

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| Bowman, 1996 | Applicant Characteristics | Multiple institution cross-sectional survey of 30,780 students graduating from US medical schools; 1991 and 1992 | Medical student surveys including Premedical Questionnaire, MSQ, and Graduation Questionnaire, as well as information for residency directors about residents in the GME tracking census | Student characteristics associated with career choice in family medicine | Over 1/3 of medical students originally interested in family medicine entered family medicine residencies compared to less than 10% of those not originally interested | 6.4% of matriculants not originally interested in family medicine entered a family medicine residency |
| Blumenthal, 1997 | Applicant Characteristics | Single institution observational study of 261 students who graduated a new medical school between 1982 and 1989 whose mission was to graduate minority physicians for primary care careers in medically underserved communities | Survey to all first-year students regarding preferences on specialty and again at time of graduation (using AAMC Graduation Questionnaire) | Outcomes of a medical school program designed to produce physicians who practice primary care in underserved communities | 57% of the first 261 medical students entering Morehouse School of Medicine between 1978 and 1985 went into primary care; 45% of these students expressed an interest in practicing in an underserved community | 100% response rate due to dedicated time given to complete survey |
| Campos-Outcalt, 2004 | Applicant Characteristics | Multiple institution cross-sectional study of 1,428 family medicine residency graduates | Survey sent to all physician graduates of 24 medical schools in 1997-1999 who entered family medicine residency and an equal number to non-family | Factors related to declining interest in family medicine | Schools with increases in graduates entering family medicine enrolled a higher proportion of students with a | The surveys sent to participants were sent up to 7 years after medical school |

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| | | | medicine primary care specialists | | stated interest in family medicine | |
| Ferrier, 1987 | Applicant Characteristics | Single institution cross-sectional study of 408 McMaster University graduates compared with 1620 graduates of other Canadian schools | Canadian Medical Association's Physician Resource Data Bank (PRDB) sent to all physicians with a current Canadian medical license | Influence of admission selection policies on career choice | McMaster University graduates are no more likely to enter primary care but are more likely to be involved in academic pursuits | The authors propose that their students may have a higher interest in academic medicine; the students differ demographically from other Canadian medical schools |
| Hull, 1996 | Applicant Characteristics | Single institution observational study of 465 medical school graduates from 1983-1985 | AMCAS application for essay, survey of graduates in 1994 to determine specialty | Relationship between medical school applicants' essays and primary care career choice | Applicants' stated interest in basic science research or career interest in primary care is predictive of career choice | Study conducted by a subcommittee of the Medical School Admissions Committee at a research-oriented medical school |
| Kallail, 2010 | Pre-matriculation Program | Single institution observational study of 104 students enrolled in a pre-matriculation program at University of Kansas | Scholars in Primary Care/Rural Health program data (demographics, performance in medical school, residency match results, and post-residency practice) | Pre-matriculation program outcome on primary care specialty choice | 72% of the University of Kansas' Scholars in Rural Health program had entered primary care, 50% had entered family medicine | A 2-year premedical curriculum for Kansas students with a rural background |
| Keith, 1988 | Applicant Characteristics | Multiple institution cross-sectional study evaluating | AAMC databases to obtain demographic information of 12,065 | Specialty choices of Howard and Meharry graduates | Black graduates from the 1975 classes entered | The findings may be a type II error given the relatively low numbers of minority |

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| | | specialty choices of Black graduates from 2 schools which used affirmative action | physicians who graduated medical school in 1975 and the AMA Physician Masterfile to obtain specialty choice and location | were compared with graduates from other US medical schools | primary care at rates similar to Black students from other schools. | graduates (144) from these two schools in the timeframe studied |
| Kost, 2015 | Applicant Characteristics | Single institution observational study of 2,047 graduates between 2000-2011 | Career preference inventory administered to 1st year students, residency match lists (NRMP) indicating residency specialty of graduates | Sustained contact with family medicine and family physicians through extracurricular programs during medical school and career choice in family medicine | Older age, female gender, rural upbringing, high level of initial interest in family medicine, and participation in family medicine extracurricular programs were significantly associated with choosing family medicine | Study involved all University of Washington School of Medicine graduates from 2000-2011 |
| Kost, 2018 | Applicant Characteristics | Multiple institution observational study of 601 graduates of one school and 744 graduates in another allopathic medical school | Medical school survey (Biographical and Career Preferences Inventory) upon matriculation; 2015 AMA Masterfile to identify eventual practice specialty | Variables related to student characteristics that predict eventual practice in family medicine | Preferring family medicine as specialty choice at matriculation increased the likelihood of match to family medicine residency programs | This study validated a previous study at University of Washington School of Medicine's use of the Family Medicine Interest Survey (FMIS), which predicts eventual practice in family medicine |
| Lawson, 2004 | Applicant Characteristics | Single institution observational study of 832 graduates from Virginia | Medical school database, AAMC GQ | Variables related to student characteristics and career choice | 51% of respondents chose primary care residencies; | 67% response rate (555) |

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| | | Commonwealth University School of Medicine; 1998-2002 | | | female gender was predictive of primary care residency choice | |
| Litzelman, 1996 | Applicant Characteristics | Single institution observational study of 1,255 Indiana University graduates from 1991-1995 | Match results from NRMP database and demographic information from school database | Student characteristics (sex/gender) affecting primary care specialty choice | The main driver of a trend towards matching into primary care was the percentage of male students matching into primary care | The rate of women matching into primary care increased in a non-statistically significant way over the same time period |
| Lupton, 2012 | Pre-matriculation Program | Single institutional observational study of 303 alumni from University of California Postbaccalaureate (UCPB) Program cohorts from 1986-1987 and 2001-2002 who matriculated into medical school compared with 586 randomly selected control physicians | 2008 AMA Physician Masterfile for control group data and UCPB graduate specialty data; UCPB program files | Long-term career outcome (specialty choice) of underrepresented minority and disadvantaged students who completed a UCPB premedical post-baccalaureate program | Greater percentage of UCPB Program graduates entered primary care (53%) than control alumni from the same school during the same timeframe (40%) | UCPB graduates also had higher percentage of working in high-poverty communities (16% vs 8% in control group) |
| Martini, 1994 | Applicant Characteristics | Multiple institution cross-sectional study of 121 four-year allopathic medical school and 15 osteopathic | Mailed survey to medical schools and graduates; AMA data, AOA data; AMA Annual Survey of Graduate Medical Education Programs | Medical school predictors that can be manipulated to affect the proportion of graduates entering primary care | "Personal social values" was the characteristic that most strongly influenced primary care career choice | Criteria used for admitting students (i.e., preferencing applicants with interest in primary care) influences primary care choice |

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| | | medical schools from 1992-1993 | | | | |
| Metz, 2017 | Pre-matriculation Program | Single institution observational Study of 525 socioeconomically disadvantaged students who entered a 2 year pre-matriculation program between 1995 and 2009 (approximately 30-35 per year) | Pre-matriculation program records (included medical school entry and completion, residency specialty choice and location, and post-residency specialty and location), medical school databases, internet searches, and personal communications with program graduates | Effect on increasing US physician diversity and primary care specialty choice in the setting of a 2 year pre-matriculation program for disadvantaged students | During the first 15 years of MEDPREP, 53% of students who completed the program entered primary care, compared to 34% of students nationally during that timeframe | The University of Southern Illinois School of Medicine hosts MEDPREP, a 2-year post-baccalaureate program designed to prepare socioeconomically disadvantaged students for medical school |
| Mitra, 2018 | Applicant Characteristics | Multiple institution prospective cohort of 1,542 first-year Canadian medical students in 15 classes between 2002 and 2004 | Student surveys distributed in the first 2 weeks of classes, Scott's Medical Database (information on Canadian physicians' area of practice and demographic distribution) | Attributes of medical students at matriculation who later practice rural family medicine | Interest in rural family medicine and older age at matriculation were associated with eventual rural family medicine practice | Students at 8 Canadian medical schools were included (n = 1542) |

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| Nayyar, 2018 | Applicant Characteristics | Single institution prospective cohort of 208 preclinical students from one osteopathic medical school | 39-question survey tool (Five Facet Mindfulness Questionnaire) and a demographic question | The association of mindfulness during preclinical years in medical school and preference for primary care residency | Being female and beginning medical school immediately after undergraduate education were both associated with preference for primary care residency | A mindfulness score is not a predictor of interest in primary care |
| Owen, 2002 | Admission subcommittee, Applicant Characteristics | Single institution cross-sectional study of 509 graduates from University of Virginia School of Medicine from 1990-1993 | Medical school applications, AMCAS data (MCAT scores, demographic data), graduate survey, AAMC's MSQ (for stated career preference) | Ability of admission committee members to accurately predict medical student applicants' specialty choice | Admissions committee members inaccurately predicted medical student generalist career choice | Study looked at 13 characteristics from University of Virginia School of Medicine applicants from 1990-1993 |
| Pearson, 2002 | Admissions Process | Multiple institution observational study of all 3747 graduates from 2 Australian medical schools between 1983 and 1998 | Mailed survey to graduates of Newcastle and Sydney University medical schools | Practice outcomes of physicians graduating from University of Newcastle and Sydney University medical schools | More graduates from the University of Newcastle practice family medicine or psychiatry than graduates from the University of Sydney (58.2% versus 43.5%) | 2469 (66%) respondents; the authors conclude admission criteria may account for the differences without specifying the admission criteria for each school |
| Penn, 1986 | Admission subcommittee | Single institution observational study of graduates from program between 1973 and 1981 | Mailed survey of 113 graduates of the University of California, San Diego admitted through the | Specialty choice and location of graduates | Graduates admitted through the SAS were more likely to be practicing primary | The SAS was specifically charged with admitting 30 percent of entering classes consisting of socioeconomically disadvantaged applicants |

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| | | | Special Admissions Subcommittee (SAS) | | care (81% versus 64%) | |
| Roman, 1994 | Applicant Characteristics | Single institution observational Study of 1,402 students from Sophie Davis School of Biomedical Education (SDSBE) from 1973 through 1988 | Medical school records, AMA Masterfile | Effectiveness of increasing medical careers and primary care specialty choices for inner-city youth | SDSBE had an explicit mission to encourage graduates to enter primary care | SDSBE graduates who were women or under-represented minorities were more likely to enter primary care |
| Rosner, 1983 | Applicant Characteristics | Single institution observational study of 258 American graduates of primarily Mexican medical schools who participated in a 10-month fifth pathway program prior to residency | Graduate survey, Medical school databases, NRMP databases | Specialty choice of graduates from primarily Mexican medical schools who participate in a 10-month fifth pathway program | 54% of "Fifth Pathway" graduates from the State University of New York School of Medicine entered primary care | The "Fifth Pathway" allows supervised clinical clerkship training for students who were educated outside the US |
| Schieberl, 1996 | Applicant Characteristics | Single institution observational study of 474 University of California, San Diego (UCSD) School of Medicine alumni from the classes of 1974, 1978, 1982, 1986, and 1990 | Survey of school alumni on demographics, school and personal factors, and specialty choice | Characteristics of medical school applicants more likely to enter primary care | Rural background, older age, and being part of an under-represented minority group, and personal social values were all associated with choosing primary care | 351 graduates of the UCSD responded (74%) |

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| Senf, 1997 | Applicant Characteristics | Multiple institution cross-sectional study of 121 US medical schools to estimate percentages of 1994 graduates in primary care practice | Survey, AAMC databases, NIH databases, AAFP databases, AMA Masterfile, and a questionnaire mailed to each medical school | Medical school characteristics that influence graduates' choice of primary care specialties | The best predictor of eventual practice of family medicine was interest in the specialty at matriculation; rural background, female sex, and attending a public medical school were all associated with entering primary care | The authors conclude that selecting applicants interested in family medicine is the most effective way to increase primary care physicians |
| Senf, 2005 | Applicant Characteristics | Multiple institution cross-sectional study of each allopathic medical school graduating class entering family medicine residency in 1997, 1998, & 1999 (118 schools) | AAFP databases (to determine proportion of class entering FM residency), survey of family medicine department heads, survey of faculty, and survey of a sample of graduates, AAMC data (MSQ and GQ) | Relationship between interest in research and interest in family medicine by US medical school graduates | Family medicine graduates were more likely to have an elective serving the underserved, nursing home experience, teaching experience, or community health experience | The authors found a negative relationship between medical students' interest in research and interest in family medicine |
| Talamantes, 2017 | Applicant Characteristics | Multiple institution cross-sectional study of 19,517 allopathic medical school matriculants in 2012 | AAMC's MSQ in 2012 | Association between community college participation and initial specialty interest among US allopathic medical students | Medical students who attended a community college were more likely to report intentions to specialize in family medicine | 9,885 students responded to the 2012 AAMC MSQ |

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| Ward, 2004 | Applicant Characteristics | Single institution longitudinal cohort of 229 first year students between 1984 and 1989 | Surveys and personality questionnaire during first year of medical school and interview four years after graduation | Factors that best predict medical career choice | Students who chose primary care were more likely to be female, while students who were more "creative and abstract in their thinking" or "conscientious and rule-bound" were less likely to choose primary care | Study in Western Australia |
| Wimsatt, 2016 | Targeted premedical recruitment | Multiple institution cross-sectional study of 123 departments of family medicine and family medicine match rates in 2011 and 2012 | Surveys of departments of family medicine, AAFP databases for family medicine match rates | Factors associated with family medicine match rates and how they differ at various medical schools | 8% of private US medical schools and 32% of public medical schools indicated that their admissions practices explicitly favored students with an interest in primary care ($p = 0.03$); this was not predictive of matching in family medicine | No details of admissions processes were described |
| Xu, 1996 | Applicant Characteristics | Multiple institution observational study of 2,955 primary care physician graduates from 1983 and 1984 of 126 US allopathic | AMA and AOA Physician Masterfile (for demographic and practice location), survey to graduates sent in 1993 | Relationship between race or ethnicity of primary care physicians and career choice | Students from under-represented minority groups were more likely than white students to report personal social | 2,199 respondents (75%) of a nationally representative sample |

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| | | and 14 osteopathic medical schools | | | values and financial factors (among others) influenced their choice of specialty | |
| Xu, 1997-1 | Applicant Characteristics | Multiple institution observational study of 2,600 primary care physicians who graduated from US allopathic schools in 1983 and 1984 | Survey sent to primary care physicians in 1993, AMA Masterfile (for specialty information) | Age as a factor influencing decision to enter primary care | Older students (30+) were more likely to have decided to enter primary care before entering medical school | 1596 respondents of a nationally representative sample |
| Xu, 1997-2 | Applicant Characteristics | Multiple institution observational study of 1,831 allopathic and osteopathic primary care physicians | Survey sent to primary care allopathic and osteopathic physicians in 1993 | Timing of specialty choice (before medical school, during the basic science years, or after clerkship years) | 41% of primary care providers reported having made their specialty choice before entering medical school | Nationally representative sample |
| Yutzenka, 2004 | Pre-matriculation Program | Single institution observational study of 28 Alumni Student Scholars Program (ASSP) graduates | Medical school databases | Pre-matriculation program outcome of primary care specialty choice | 25 of 28 alumni entered USDSM. Five of 11 (45%) ASSP alumni who had completed medical school entered family medicine residencies | University of South Dakota School of Medicine (USDSM) hosts a pipeline project called the Alumni Student Scholars Program (ASSP) that identifies high quality high school graduates interested in medical careers, especially family medicine |

Appendix 1.

Abbreviations:

AAFP: American Academy of Family Physicians
AAMC: American Association of Medical Colleges

MCAT: Medical College Admissions Test
MSQ: Matriculating Student Questionnaire

AMA: American Medical Association
AMCAS: American Medical College Application Service
AOA: American Osteopathic Association
GQ: Graduate Questionnaire

NBME: National Board of Medical Examiners
NIH: National Institute of Health
NRMP: National Resident Matching Program