

The Changing Paradigm of Contemporary
U.S. Allopathic Medical School
Graduates' Career Paths:
Analysis of the 1997-2004 National AAMC
Graduation Questionnaire Database

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Background

- Since 1990, changes in the fabric of medical education have been observed
 - Demographics of U.S. allopathic medical school graduates have changed
 - Medical-school programs have changed
 - Graduates' career paths have changed

Background

- The proportion of:
 - Women graduates has increased
 - White graduates has decreased
 - Non-white minority groups overall has increased, but has varied among different groups

Background

- Since 1990, there has been an increase in
 - the number and scope of dual-degree program offerings at U.S. allopathic medical schools and
 - the proportion of students graduating from combined-degree programs

(Richard & Lockwood, *JAMA* 2001; 285: 2249-2250)

Background

- Nearly all schools offer MD/PhD programs
 - 121 offer MD/PhD in Physiology
 - 120 offer MD/PhD in Biochemistry
- 71 schools offer MD/MPH programs
- 47 schools offer MD/MBA programs
- 20 schools offer MD/JD programs

(Available at <http://services.aamc.org/currdir/section3/degree2.cfm>.
Accessed 4/3/2006)

Background

- In 1990, 65% of U.S. allopathic medical graduates intended to enter full-time clinical practice (Richard & Lockwood, 2001)
- In more recent years, there has been an increase in the proportion of U.S. allopathic medical graduates intending **not** to enter full-time clinical practice

(Richard & Lockwood, *JAMA* 2001; 285: 2249-2250)

Purpose

- Identify factors associated with contemporary medical graduates' intentions to pursue alternative careers compared with full-time clinical practice

Methods

- Washington University School of Medicine IRB approval
- 1997-2004 American Association of Medical Colleges Graduation Questionnaire (AAMC GQ) data
- Anonymous, individualized records for 108,408 U.S. allopathic medical graduates

Study Design

- Associations between graduates' career intentions and various individual-level factors
- Independent (predictor) variables included responses to 13 GQ items
 - Demographic characteristics
 - Educational experiences
 - Career-related plans

Demographic Characteristics

- Gender
- Race/ethnicity
- Year of graduation
- School ownership (public vs. private)
- School region (NE, S, W, MW)
- Total debt at graduation
- Age at graduation
- Dual-degree program graduation
(MD/PhD; MD/other degree; MD only)

Educational Experience

- Satisfaction with quality of medical education
- Satisfaction with academic counseling
- Confidence in acquisition of clinical skills for residency training

- 5-point scales
- Reverse coded so that higher means indicated more satisfied or confident

Career-related Plans

- Plan to practice in underserved areas (Yes, Undecided, No)
- Plan to become board certified in a specialty (Yes, Undecided, No)

Dependent Variable

- Alternative-career intentions
 - Full-time University Faculty in clinical or basic science teaching/research
 - “Other” non-clinical-practice setting
 - state or federal agencies
 - medical or healthcare administration
 - non-university research scientists
 - Undecided
- Full-time Clinical Practice (reference)

Data Analysis

- Multiple logistic regression
- Odds ratios (OR) and 95% confidence intervals (95% CI)
- ORs indicate the odds (or likelihood) of observing the outcome per unit of change on the independent variable
 - OR $>$ 1.000 indicates greater odds
 - OR $<$ 1.000 indicates less odds

Data Analysis

- 95% CIs inform us not only about the likelihood that this condition will occur by chance (statistical significance) but also gives us a range of possible values for a true effect given the results of the sample of data
 - 95% CI that contains 1.000 (when reporting OR) is **not** statistically significant
 - It means equal odds that the outcome will be observed per unit of change on the IV
 - Larger samples, the CI will be narrower, more precise

(Young & Lewis, *Ann Emerg Med* 1997;30(3):307-310)

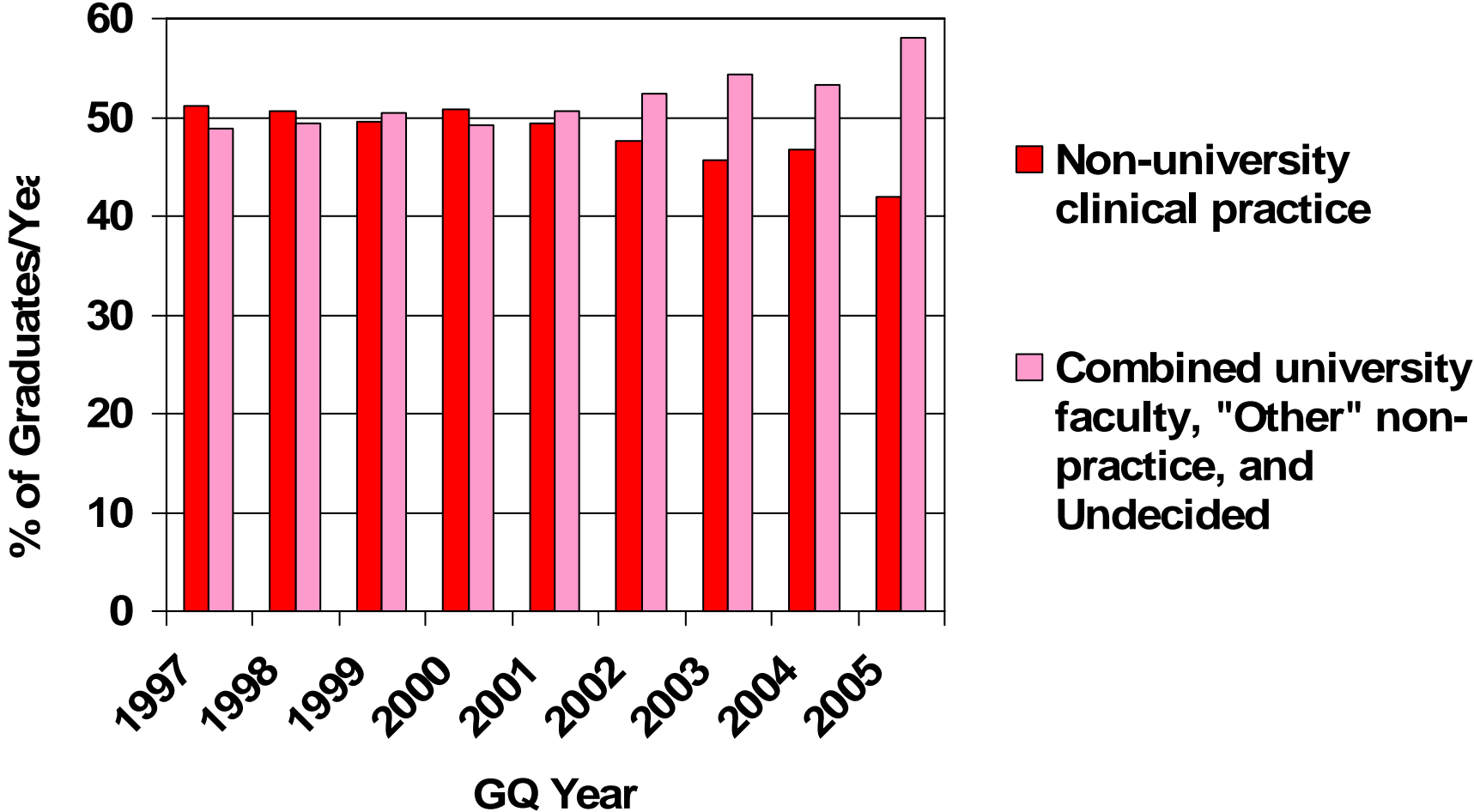
Results

- 102,915 graduates with complete data (94.5% of 108,408 completing 1997-2004 AAMC GQ)
- 81.5% of all 126,325 U.S. allopathic medical school graduates in 1997-2004
- All 13 variables independently associated with alternative-career intentions in the multiple logistic regression model

GQ Year

GQ Year	OR	CI
1997	1.000	
1998	1.033	0.982 – 1.087
1999	1.101	1.046 – 1.159
2000	1.064	1.012 – 1.119
2001	1.119	1.065 – 1.177
2002	1.229	1.169 – 1.293
2003	1.318	1.252 – 1.387
2004	1.320	1.250 – 1.395

Intended Career Paths of 1997-2005 U.S. Medical Graduates



Gender

Gender	OR	95% CI
Male	1.000	
Female	1.112	1.084 – 1.141

Race/Ethnicity

Race/ethnicity	OR	95% CI
White	1.000	
African American	1.127	1.070-1.188
Hispanic	1.177	1.116-1.242
Asian/Pacific Islander	1.300	1.256-1.345
Native American	1.246	1.065-1.459
No response	1.375	1.206-1.567

School Ownership

	OR	95% CI
Public	1.000	
Private	1.395	1.354 – 1.436

School Region

	OR	95% CI
Midwest	1.000	
Northeast	1.559	1.506 – 1.613
West	1.211	1.157 – 1.268
South	0.870	0.841 – 0.900

Age at Graduation

Age Category	OR	95% CI
26 and younger	1.000	
27-29 years	1.080	1.049 – 1.111
30-32 years	1.173	1.122 – 1.227
33 or older	1.075	1.024 – 1.128

Level of Debt

Level of debt	OR	95% CI
No debt	1.000	
\$1 - \$49,999	1.605	1.531 – 1.683
\$50,000 – \$99,9999	1.607	1.531 – 1.688
\$100,000 - \$149,999	1.324	1.267 – 1.383
\$150,000 or more	1.160	1.111 – 1.211

Dual-degree Graduation

Degree Program	OR	95% CI
MD (incl. BA/MD)	1.000	
MD/PhD	13.351	11.203 – 15.911
MD/Other degree	1.949	1.700 – 2.234

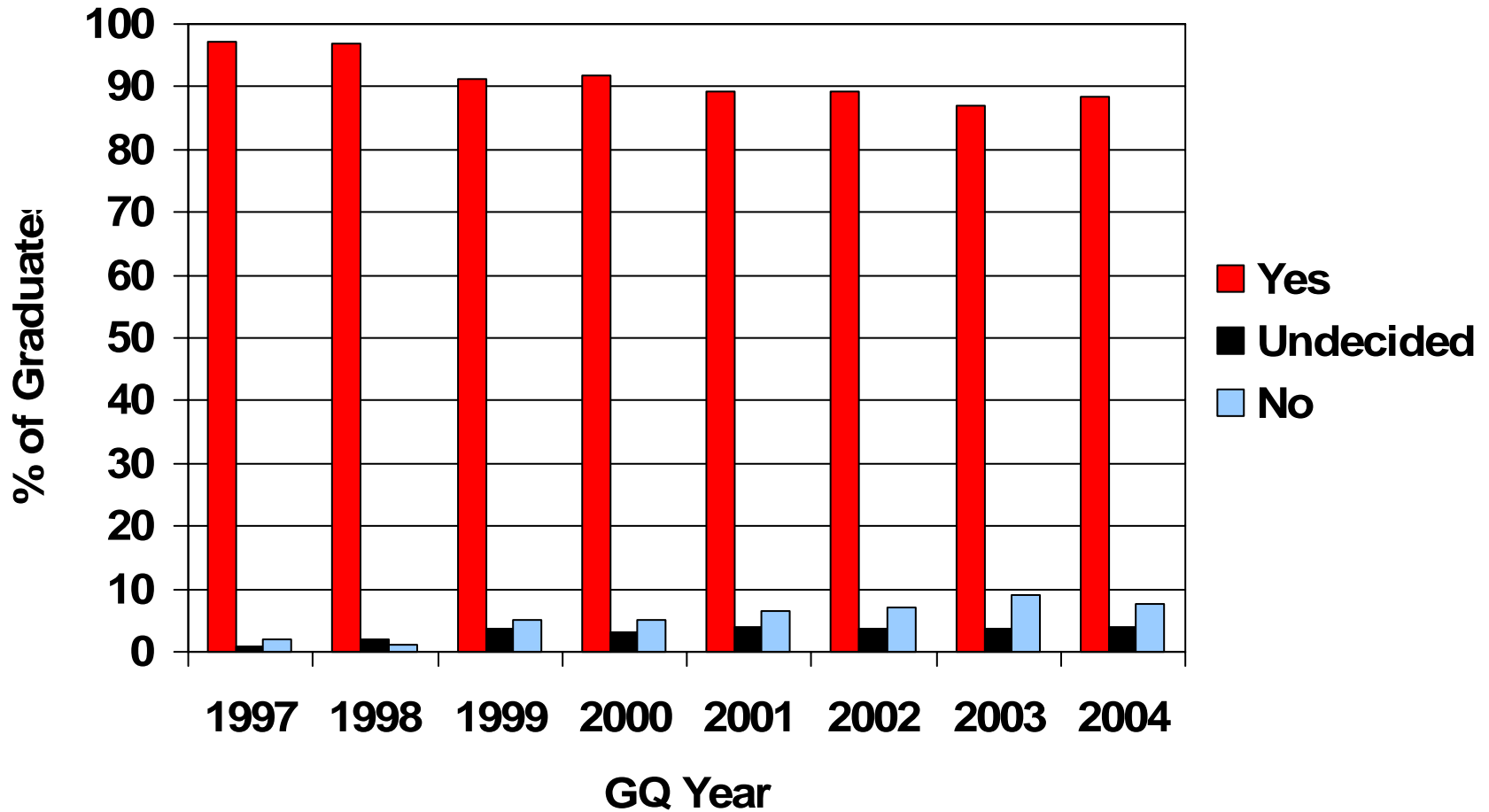
Medical School Experiences

	OR	95% CI
Quality of medical education	1.065	1.045 – 1.085
Academic counseling	0.962	0.950 – 0.975
Acquisition of clinical skills	1.108	1.086 – 1.130

Plan to Practice in Underserved Area?

	OR	95% CI
No	1.000	
Yes	0.935	0.902 – 0.968
Undecided	1.337	1.299 – 1.376

Board-certification Plans of 1997-2004 U.S. Medical Graduates



Board-certification Plans

Plan to become board certified?	OR	95% CI
Yes	1.000	
No	1.234	1.166 – 1.306
Undecided	0.639	0.593 – 0.688

Conclusions

- The proportion of U.S. graduates committed to full-time clinical practice likely will continue to decrease
 - As numbers of demographically diverse and dual-degree graduates continue to increase
 - As alternative-career opportunities for physicians expand

Alternative Career Opportunities for Physicians

- In addition to academic-faculty positions, physicians pursue careers in a wide range of settings completely outside patient-care
 - biotechnology
 - pharmaceutical
 - healthcare-consulting industries
- And they might very well make important contributions to the field of medicine

Implications for Our Physician Workforce

- **But** the growing proportions of U.S. medical graduates pursuing alternative careers, ***particularly*** those pursuing careers that involve no direct patient care, will functionally exacerbate the projected shortage of practicing physicians in the U.S.

(Cooper et al., *Health Affairs* 2002;21(1):140-154)
(AAMC. The physician workforce: position statement.
<http://www.aamc.org/workforce/12704workforce.pdf>)

Strengths/Limitations

- Strengths
 - Population-based sample
 - Collected over several years
- Limitations
 - Data are cross-sectional
 - Representing U.S. medical graduates' perspectives at the time of their graduation
 - Unable to determine the extent to which graduates' career intentions predicted their actual career paths.

Areas for Further Investigation

- Career paths/professional endeavors of graduates who do not enter GME
- Systematic follow-up of dual-degree program graduates to characterize their career paths
- Long-term follow-up of recent U.S. graduates to assess stability of career intentions at graduation