

Medical Students' Knowledge of the U.S. Health Care System and Their Preferences for Curricular Change: A National Survey

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Abstract

Purpose

To measure medical students' knowledge of central issues in the U.S. health care system and to understand their perception of the importance and quality of health policy curricula at their medical schools.

Method

A questionnaire was developed using facts from recent national and international health reports to test students' knowledge of health policy. The instrument, containing 14 questions about health policy and four questions about school curriculum on health policy, was mailed to a national probability sample of 516 first-year and 847 fourth-

year students in the United States. Chi-square and *t* tests were used to compare the responses of first- and fourth-year students.

Results

A total of 295 first-year (57%) and 475 fourth-year students (56%) responded. Nearly all respondents were aware of the adverse health consequences for the uninsured, but 40% of first- and fourth-year students underestimated the numbers of uninsured in the United States. Thirty-two percent of respondents incorrectly answered that the United States had the highest life expectancy of any nation, and 27% were not aware that the United States has the highest

health cost per-person of any nation. First- and fourth-year students performed similarly on knowledge questions. Ninety-six percent of respondents felt that knowledge of health policy is important to their career, and 54% expressed dissatisfaction with the health policy curriculum in medical school.

Conclusion

Medical students have significant gaps in knowledge concerning the U.S. health care system. Most students perceive that these deficiencies are not adequately addressed in the medical school curriculum.

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Recent years have brought new challenges to the practice of medicine, as a recent report from the Institute of Medicine states:

The American health care system is confronting a crisis. The cost of private health insurance is now increasing at an

annual rate in excess of twelve percent, while at the same time individuals are paying more out of pocket and receiving fewer benefits. One in seven Americans is uninsured and the numbers of uninsured are on the rise. . . . And disturbing racial and ethnic disparities in access to and use of services call into question our fundamental values of equality and justice for all. . . . The health care delivery system is incapable of meeting the present, let alone the future needs of the American public.^{1, p. 1–2}

If it is true that today's medical students are inheriting a health care system in crisis, how prepared are they for this challenge? Although national medical^{2,3} and governmental bodies^{3,4} have called for the training of physicians in health policy, health systems, and systems-based practice, it is unclear how well physicians-in-training are learning these subjects.

Previous studies examined the opinions of medical students and physicians on health policy issues,^{5–15} but only a few geographically limited studies have assessed medical students' knowledge of these topics.^{6,16} We, therefore, surveyed a national probability sample of first- and fourth-year students to measure their

knowledge of central issues in the U.S. health care system and to examine their impressions of their education about health policy and health care delivery.

Method

Study sample

We selected a random sample of first-year (*n* = 640) and fourth-year (*n* = 960) medical students from the master file of the American Medical Association. We over sampled fourth-year students because we anticipated a lower response rate from them. After eliminating undeliverable addresses, the sample size was 516 first-year and 847 fourth-year students. In Spring 2002, we mailed the questionnaire to the students with an enclosed \$2-dollar incentive. After four-weeks, we mailed a second copy of the questionnaire to nonrespondents. We closed data collection at eight weeks.

Questionnaire development and content

We derived all knowledge questions from recent national and international reports published in medical journals and the popular press.^{1,17–22} We obtained IRB approval through the University of

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Table 1

Age and Anticipated Debt on Graduation among Respondents and All U.S. Medical Students, from a Survey of Students' Knowledge of the U.S. Health Care System, 2002

Characteristic	First-year students		Fourth-year students	
	All U.S. medical students*	Respondents	All U.S. medical students*	Respondents
Mean age, years	24	25	28	28
Anticipated debt on graduation				
< \$50,000	NA	26%	30%	27%
\$50,000–\$100,000	NA	25%	25%	27%
\$100,000–\$150,000	NA	27%	27%	27%
> \$150,000	NA	23%	18%	19%

* Data are from Association of American Medical Colleges. 2002 Medical School Graduation Questionnaire All Schools Report, Washington DC, 2002 (<http://www.aamc.org/data/gq/allschoolsreports/start.htm>), accessed 28 January 2005), and Association of American Medical Colleges. Matriculant Age at Anticipated Matriculation, 1992–2001 (<http://www.aamc.org/data/facts/archive/famg122001a.htm>), accessed 28 January 2005). NA, not available.

Virginia Survey Research Center. We pretested the questionnaire among a convenience sample of 20 students at an allopathic medical school in Virginia. The final questionnaire (available from the authors) included 12 true/false and two multiple-choice questions assessing knowledge of health care financing, health systems performance, and health care access. Another section of the questionnaire contained a series of questions asking students to rate the

importance and quality of learning experiences in health policy, using four- or five-point Likert-type scales, and to indicate additional types of learning experiences they would find useful.

Statistical analysis

We used the inverse probability weights to correct for disproportionate response rates among gender and racial/ethnic groups. The reported frequencies therefore represent frequency estimates

among the national population of third- and fourth-year medical students. We used *t* tests to compare mean values of continuous variables and chi-square tests to compare proportions among categorical variables between first- and fourth-year respondents.

Results

Respondents' demographics

A total of 295 first-year students (57%) and 475 fourth-year students (56%) responded, for a total of 770 respondents (57%).

Respondents were similar to the U.S. medical student population with respect to age and anticipated debt on graduation (see Table 1), according to statistics from the Association of American Medical Colleges.^{23,24} Female students were more likely than male students to respond to the questionnaire (63% vs. 55%, *p* < .01). Sixty percent of nonrespondents were men; we did not obtain data on the race and ethnicity of nonrespondents. Due to the disproportionately high response rate among white women, we derived race and ethnicity and gender weights based on the proportion of each gender and racial or ethnic group in the U.S. medical student population, with a maximum weight of 2.00 assigned to any group (see Table 2).²⁵

Table 2

Gender and Racial/Ethnic Distribution of Respondents (with and without Weighting) and of All U.S. Medical Students, from a Survey of Students' Knowledge of the U.S. Health Care System, 2002

Group	First-year students				Fourth-year students			
	% of U.S. medical students*	Unweighted % of respondents (no. = 295)	Weight	Weighted % of respondents	% of U.S. medical students*	Unweighted % of respondents (no. = 475)	Weight	Weighted % of respondents
White/other male	37.07	32.41	1.144	37.08	38.17	43.25	.883	38.60
White/other female	29.05	36.55	0.795	29.05	28.04	33.12	.847	28.35
Black male	2.71	1.38	1.962	2.71	2.79	0.84	2.000 [†]	1.71
Black female	4.72	4.83	.978	4.72	4.56	3.80	1.201	4.61
American Indian/Hispanic male	3.78	2.41	1.566	3.78	3.89	2.32	1.677	3.93
American Indian/Hispanic female	3.39	2.76	1.228	3.39	3.27	2.53	1.291	3.31
Asian/Pacific Islander male	10.44	11.03	.946	10.44	10.75	7.17	1.499	10.87
Asian/Pacific Islander female	8.84	8.62	1.025	8.84	8.53	6.96	1.225	8.63

* Population figures were estimated using data from Educational Programs in U.S. Medical Schools, 2000–2001,²⁵ which provided the percentage of women entering U.S. medical schools yearly from 1980–1981 to 2000–2001 and the racial/ethnic breakdown for all medical students in 1999–2000 by gender. Gender counts for the 2001–2002 class were not available at the time of the survey, so data for the 2000–2001 class were substituted.

† The calculated weight of 3.21 was limited to 2.00 to minimize the potential for this small number of respondents (no. = 4) to exert excessive influence on the overall sample.

Table 3

Responses of First- and Fourth-Year Medical Students to Questions Assessing Their Knowledge of the U.S. Health Care System and Health Policy, 2002

Question	Correct answer	% who chose correct answer		
		First-year students (no. = 295)	Fourth-year students (no. = 475)	p Value
The United States has a higher life expectancy than any other nation in the world.	False	71.7	65.6	.08
The United States has a lower infant mortality rate than any other nation in the world.	False	59.4	69.8	.003
Government-administered health insurance (e.g., Medicare) requires more money per person for administrative costs than private health insurance.	False	47.0	34.2	.001
The United States is the only industrialized nation in the world not to guarantee access to health care for all of its citizens.	True	39.5	41.1	.65
The United States spends more per person on health care annually than any other nation in the world.	True	68.5	76.2	.02
People without health insurance are less likely to have a regular source of medical care.	True	97.2	95.4	.10
People without health insurance are more likely to suffer from avoidable hospitalizations for diseases such as asthma and diabetes mellitus.	True	96.0	95.3	.62
People without health insurance are more likely to suffer from delayed diagnoses for diseases like cancer.	True	98.3	96.6	.13
Most individuals without health insurance are in families where no one works.	False	86.7	87.6	.72
Raising the cost of co-payments or deductibles does not affect whether patients will go see their doctor.	False	90.4	89.9	.79
The number of uninsured individuals in the United States increased over the last decade.	True	89.4	90.4	.65
The number of uninsured individuals in the United States increased over the last six months.	True	84.6	82.1	.36
How do you think African Americans compare to whites in terms of having health insurance? (Choices: Better off, Just as well off, Worse off)	Worse Off	92.4	92.1	.80
How do you think Latinos compare to whites in terms of having health insurance? (Choices: Better off, Just as well off, Worse off)	Worse Off	96.3	94.6	.63
How do you think Asian Americans compare to whites in terms of having health insurance? (Choices: Better off, Just as well off, Worse off)	Worse Off	25.2	25.9	.49
Where, approximately, did the United States rank, out of 191 countries, in a 2000 World Health Organization report on "health systems performance?" (Choices: Near first place, Near 10th place, Near 20th place, Near 30th place, Near 40th place)	Near 40 th place	13.3	10.3	.73
How many uninsured people are there in the United States today? (Choices: Fewer than 15 million, 15 to 25 million, 25 to 35 million, 35 to 45 million, 45 to 55 million, Over 55 million).	35 to 45 million	31.0	26.2	.80

Knowledge of the health care system delivery and financing

We asked students where the United States ranked in the well-publicized 2000 World Health Organization's (WHO) ranking of 191 nations based on "overall health systems performance," defined as health-achievement (measured in population disability-adjusted life expectancy) related to health system expenditure.²² Eleven percent of respondents correctly identified the answer (37th or "near 40th place"), while 89% overestimated U.S. performance. Regarding U.S. performance on key health indexes in comparison to other nations, 32% incorrectly answered that

the United States had the highest life expectancy of any nation, and 34% answered that the United States had the lowest infant mortality rate. When asked about health care costs, 27% were not aware that the United States spends more per person on health care than any other nation. With regard to health care financing, 61% were not aware that the administrative costs of private health insurance exceed those of Medicare.

Knowledge of health care access

Overall, 90% of respondents correctly answered that the numbers of the uninsured have grown over the past decade, and 83% recognized that the

proportion of uninsured Americans increased during and immediately prior to the study period. In contrast, 28% were able to quantify accurately the number of uninsured in the United States, with 40% of both first- and fourth-year students underestimating the numbers of uninsured.¹⁷ Most respondents (87%) knew that working people and their families are the majority of uninsured individuals in the United States. Most respondents also knew that African Americans (92%) and Latinos (96%) are at greater risk of not having health insurance, but only 25% were aware that a high number of Asian Americans are uninsured. Nearly all

students (96%) recognized that being uninsured may lead to adverse health consequences, including unnecessary hospitalizations, delayed diagnoses, and lack of a regular source of care. A total of 90% were aware that out-of-pocket costs could be a barrier to health care access, even for those with insurance. Most students (60%), however, did not know that the United States is the only industrialized nation without some form of universal coverage system (see Table 3).

Differences in knowledge by year in medical school

Overall, 90% of students correctly answered more than half of the true/false questions; however, less than half of the respondents in each class correctly answered eight or more of the 12 questions. Performance varied significantly by year of medical school on three of the 12 questions (see Table 3); however, the average number of correct true/false responses was similar among first-year and fourth-year students (7.17 vs. 7.29; $p = .23$). Furthermore, similar proportions of first- and fourth-year students correctly located the United States in the WHO's ranking of health care systems (13% vs. 10%; $p = .73$). We found no statistical difference in the proportion of first-year and fourth-year students who correctly estimated the number of uninsured in the United States (31% vs. 26%; $p = .80$).

Medical student satisfaction with teaching in health policy

Nearly all respondents (96%) felt that understanding health policy was important to practicing medicine. Roughly half of all respondents expressed dissatisfaction with both premedical (48%) and medical school coursework (54%) related to health policy, health care delivery, and health care reform issues, with no statistically significant differences between first- and fourth-year students.

Suggestions for curricular reform on health policy

Overall, 89% of all respondents wanted increased exposure to health policy, health care delivery, and options for health care reform. When students who expressed this view were asked in what format(s) they wanted to have this exposure, fourth-year students were more likely than first-year students to indicate a desire for required medical

school coursework (67% vs. 48%, $p < .01$), whereas first-year students were more likely than fourth-year students to want additional premedical coursework (27% vs. 17%, $p < .01$), elective medical school coursework (60% vs. 54%, $p = .01$), and extracurricular experiences (63% vs. 54%, $p < .01$).

Discussion

In this nationally representative survey of first- and fourth-year medical students, we identified important gaps in their knowledge about the U.S. health care system. While the vast majority of students recognized that access to health care for the uninsured was a major problem, most students demonstrated incomplete knowledge of the magnitude and demographics of that problem, the performance of the U.S. health care system in comparison with other countries, and the financing of health care in the United States. In this cross-sectional study, we observed no appreciable difference in performance between first- and fourth-year students, raising concerns about the content and effectiveness of existing curricula in health policy and health care financing.

Our study's principal strengths are its national scope and the sampling method, which allowed generalizability to the population of first- and fourth-year medical students in the United States. In addition, we assessed students' knowledge directly by asking them to answer a series of questions about core health policy issues. This approach to knowledge assessment may be more valid than questionnaires asking students to rate their own level of knowledge, a method that may be subject to social desirability bias.

As with many surveys of physicians and medical students, our study's main limitation is the potential for response bias. In this case, the high number of respondents reporting an interest in learning about health policy may be the result of students with greater general interest in health policy completing the questionnaire. If this response bias did occur, then the knowledge deficiencies observed among these motivated students are even more striking.

Consistent with a prior survey,²³ medical students in our survey acknowledged

their inadequate training in health care policy issues during medical school. Our respondents widely agreed that knowledge of health policy is important to their future careers, and they advocated for additional exposure. Medical educators should consider expanding and enhancing health policy curricula to improve students' satisfaction with their education and to produce a physician work force prepared to function and improve the system in which they work.

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