RESEARCH LETTERS

Does Graduate Medical Education Also Follow Green?

In his 2008 research letter, Ebell[1] highlights the relationship between residency fill rates and physician specialty salary ($r=0.82$). Mullan[2] referred to this as the "white-follows-green law." In the same issue, Salsberg et al[3] reported that graduate medical education (GME) expansion since funding caps were put in place favored nonprimary care specialties and was associated with a reduction in primary care production. Hospital supply of residency positions is known to play a role in determining the composition of the physician workforce. As noted in the May letter from the Council on Graduate Medical Education (COGME) to Congress,[4] "financial concerns have affected the majority of teaching hospitals' decisions about selection of training positions." In the hope of informing these concerns that hospitals may be responding to financial incentives over workforce needs in their allocation of GME positions, we explored the relationship between physician income and 10-year growth in primary care residency positions vs those in a group traditionally noted for their "lifestyle" appeal and higher likelihood of driving hospital revenues.

Methods. Median salary for physicians in 4 specialties frequently cited for their high income and "lifestyle" appeal and 3 primary care specialties was obtained from the 1999 and 2008 American Medical Group Management Association surveys. Change in median salary was adjusted for inflation using the US Bureau of Labor Statistics inflation calculator (http://www.bls.gov/data/inflationcalculator.htm). Growth in Accreditation Council for Graduate Medical Education (ACGME)-accredited year 1 positions (PY-1) was calculated using program director projections reported in the 1998 and 2008 *JAMA* medical education issues.[5,6] General internal medicine PY-1 was modified to account for direct loss to preliminary year graduates and indirect loss to first-year subspecialty positions (**Table**).

Results. A strong relationship exists between median specialty income and PY-1 growth for primary care and lifestyle specialties ($r=0.87$) (**Figure**). Growth in PY-1 also correlated with the change in median specialty income between 1998 and 2008 ($r=0.84$). The relationship between 2007 median specialty income and residency position growth held when considering internal medicine subspecialty positions and emergency medicine positions ($r=0.62$) and remained when adding all specialties that Ebell[1] considered in his 2008 study ($r=0.41$). While family medicine residency programs lost positions over the past decade (–390 PY-1), emergency medicine residencies added positions (+394 PY-1). Growth in internal medicine subspecialty programs (+1150 PY-1) and internal medicine preliminary positions (+290 PY-1) account for decreased general internal medicine PY-1 targeted toward primary care (–865 PY-1). With low starting salaries and declining median compensation, primary care specialties lost residency positions, while hospitals offered more residency positions to "lifestyle specialties" with high and growing median salaries.

Comment. Just as Ebell[1] demonstrated decreased student interest in low-compensation primary care specialties, teaching hospitals have also favored higher revenue-generating specialty training over primary care positions.

Table. Year 1 Residency Positions (PY-1) and Median Specialty Salary Data

Specialty	1998 PY-1, No.	2008 PY-1, No.	1998 Adjusted Median Salary, $	2007 Income, $
Anesthesiology	1025	1114	330 483	398 925
Dermatology	291	353	255 213	357 945
Emergency medicine	1120	1514	232 761	256 800
Family medicine	3682	3292	182 646	173 812
General internal medicine (adjusted)	3297	2432	186 437	190 547
Internal medicine subspecialties	3349	4499		
Internal medicine preliminary year	1733	2095		
Ophthalmology	467	463	281 904	315 982
Orthopedic surgery	601	657	412 583	446 303
Radiology	896	1114	359 051	450 658
Pediatrics	1738	1600	178 318	164 000
Pediatric subspecialties	780	1106		

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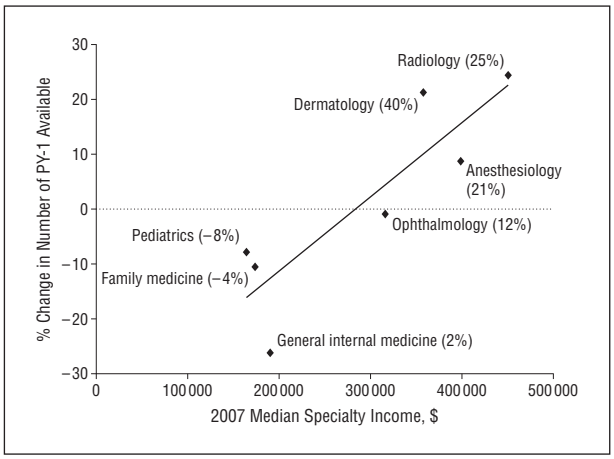

Figure. Percentage change in number of year 1 residency positions (PY-1) offered from 1998 to 2008 vs 2007 income by specialty. Percentages in parentheses are percentage growth in specialty income adjusted for inflation between 1998 and 2007.

Expansion of positions in the "R.O.A.D." disciplines (radiology, ophthalmology, anesthesia, and dermatology) and emergency medicine over the last 10 years parallels losses in family medicine, general pediatrics, and general internal medicine. General internal medicine positions increasingly serve as channels for revenue-generating subspecialty programs, leaving fewer internal medicine positions dedicated to primary care. Policy makers hoping to realize the superior health outcomes and decreased costs associated with greater access to primary care may find this trend alarming.[7] Our findings support the concern expressed by the COGME that instead of responding to policy aims to correct shortage in the primary care pipeline, hospitals are instead training to meet hospital goals.

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1. Ebell MH. Future salary and us residency fill rate revisited. *JAMA*. 2008;300(10):1131-1132.
2. Mullan F. Some thoughts on white-follows-green law. *Health Aff (Millwood)*. 2002;21(1):158-159.
3. Salsberg E, Rockey PH, Rivers KL, Brotherton SE, Jackson GR. US residency training before and after the 1997 Balanced Budget Act. *JAMA*. 2008;300(10):1174-1180.
4. Robertson RG; Council on Graduate Medical Education. Letter to: Kathleen Sebelius (Secretary of Health and Human Services). May 5, 2009. http://www.cogme.gov/cogmeletter.htm. Accessed July 1, 2009.
5. Brotherton SE, Etzel SI. Graduate medical education, 2007-2008 [Tables 9 and 10]. *JAMA*. 2008;300(10):1228-1243.
6. Graduate Medical Education [Appendix II, Table 1A.—Resident physicians in ACGME-accredited and in combined specialty graduate medical education (GME) programs on August 1, 1997]. *JAMA*. 1998;280(9):836-841.
7. Macinko J, Starfield B, Shi L. The contribution of primary care systems to health outcomes within Organization for Economic Cooperation and Development (OECD) countries, 1970-1998. *Health Serv Res*. 2003;38(3):831-865.

The Scope and Targeting of Influenza Vaccination Reminders Among US Adults: Evidence From a Nationally Representative Survey

Despite broad recommendations and substantial evidence regarding effectiveness and safety, influenza vaccine uptake among US adults falls short of targeted rates.[1,2] Rigorously designed studies have shown that patient reminders are highly effective in improving influenza immunization rates.[3,4] Yet, there are no nationally representative data concerning the share of adults who currently receive influenza vaccination reminders, and there is no evidence regarding the targeting of these reminders toward patients recommended for vaccination.[1] We present herein nationally representative estimates of self-reported receipt of a reminder to be vaccinated against influenza among US adults and show how reminder receipt varies by recommendation status.

Methods. We analyzed data from a nationally representative survey of US adults 18 years and older (N=5105) fielded by Knowledge Networks (Menlo Park, California) between March 4 and April 7, 2009. Knowledge Networks operates an online panel of households that covers both the online and offline population.[5] Sixty-nine percent of sampled panelists responded to the survey.

The survey asked respondents about receipt of a postcard, letter, e-mail, or telephone call reminder concerning influenza vaccination from (1) a physician, (2) a nurse, physician's assistant, or other health care provider, (3) a health insurance or health plan, (4) a health department, or (5) an employer during the last fall season, allowing for multiple responses. We merged categories (1) and (2) into a combined category "health care provider."

We assessed membership in a subgroup for whom vaccination against seasonal influenza is specifically recommended using measures of self-reported age (50 years and older), health conditions (diabetes, heart disease, chronic

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