

EDITORIAL

They really do go

RC Bowman

Co-North American Regional Editor, Rural and Remote Health

Submitted: 8 July 2008; Published: 24 July 2008

Bowman RC

They really do go

Rural and Remote Health 8: 1035. (Online), 2008

Available from: <http://www.rrh.org.au>

Do they go?

It is not uncommon to hear the words ‘They really don’t go’ from deans, medical association leaders, or workforce ‘experts’ as they share their observations of the most recent rural origin or underserved origin graduates who seem to have failed to fulfill their expectations of physician distribution.

While it is technically correct that 70-80% of rural or underserved origin candidates do not go ‘outside’ current concentrations of physicians and health resources, the appropriate statistical analysis reveals that *they really do go* at rates 2, 4, 6, or 10 times higher than the typical medical students. Others also go, such as the 75% of rural physicians who have urban origins or those with top income origins that serve the underserved. Family physicians also go to underserved or rural areas at 2-4 times greater levels. Older

graduates, those born outside of cities and counties with medical schools, and those of lower or middle income origins also go. The graduates of most medical schools exceed national averages in rural and in underserved distribution.

They really do go unless steps have been taken to prevent physician distribution. Only those with extremes of origins, those with extremes of training, and those influenced by extremes of health policy fail to go.

With efforts directed toward understanding and awareness as well as much hard work, these steps that concentrate physicians in a narrow range of locations can be reversed. As with any challenging yet necessary task, the will to make a change is the most important requirement of all.

Judgment is not being passed on such leaders. The changes that have resulted in poor physician distribution are



cumulative over a past century of decision-making. This has also been complicated by many of these steps having been made long before the current leadership assumed their roles. Massive deficiencies in workforce research investment and a lack of journal space for career and location studies are also difficult obstacles to overcome. It is even more difficult to recognize changes that impact physician distribution in the birth to admission components (nurturing, child development, education, and opportunity) that are long before admission, and far beyond the experiential framework of medical education leaders, deans, and editors who have spent their entire lives 'inside' the top concentrations of physicians, income, private schools, and health resources.

Physician distribution is a matter of what happens 'outside' while more pressing day-to-day matters dominate the attention of those 'inside'. Massive clinical, research, and information enterprises demand constant attention. What is seen and heard is a matter of those who immediately surround medical school deans and leaders. Close associates are not likely to understand outside unless special efforts are made. Few schools have 'outreach' deans, rural or underserved task force leaders, or representatives who translate the world outside to those inside. States also fund medical education at lower and lower levels. Even if a state threatened to remove medical education funding for failures to address state populations outside or those left behind, the remaining state support is often insufficient to constitute much of a threat. The ultimate outcomes are shaped by policies and market forces and the consequences in physician distribution, primary care, and healthcare access are multiple and related. The major consequence is less and less awareness of a number of populations who are outside for those who are inside who make the decisions that shape workforce. The experiential place framework of inside and outside of concentrations is the key to understanding the principles of physician distribution.

The principles of distribution have been established with over a century of evidence. The principles of distribution are not complex for those who have had the blessing of outside experiential place in origins, training, or practice. For those

outside, the principles are a matter of common sense. The principles of distribution are complex mainly for those who do not have a perception of inside versus outside.

Physician distribution is about physician origins outside, training outside, and policy supporting physician location outside of current concentrations of physicians. The primary functions of medical education are all impacted since medical schools select those who become physicians, shape medical training, and determine policy.

Physician origins outside

The easiest way to describe origins outside is to describe the current children of concentration who gain admission at the highest levels. It is not enough to have medical students admitted at 65% or more from the top 20% income levels in the nation¹. Medical students now most commonly have origins that represent combinations of concentration. They are highest income and most urban and children of professionals who are raised in the shadow of medical schools or medical center concentrations of physicians. Professional parents are built-in career advisors who can add the 'polish' highly desired by the professionals who make decisions on admission committees. Each of these factors also increase standardized test scores and also increase the probability of admission. The same factors all reduce the probability of distribution and reduce the probability of a final career choice involving basic access to health care.

Origins outside are basically those who have a more normal experiential place of origin, compared with those who have the most concentrated origins. More normal scores, barriers of income and education that shape older age at medical school admission, lack of 'polish', and lower probabilities of admission are also the norm for those from outside. It takes much interview training to properly assess applicants from the different cultures of those outside (eg rural, Muslim, First Nations [Native American], lower income origin). Applicants most uncomfortable with ultimate urban training locations may well have the best distribution potential. A good portion of difference in standardized test scores is also



about being different from children of concentration. Standardized tests can break down completely as evaluation tools for those most different who also have the highest levels of potential distribution. The lessons of the significant limitations of standardized testing known for the past 80 years appear to have been lost². The consequences involve further physician concentration. Retraining admissions committees not only increased the African American, Hispanic, and First Nations medical school admissions³. Retraining also managed to slow the rate of decline of rural origin admissions in the 1990s. As much as possible admission committees must prioritize a focus on the candidate being evaluated and not be distracted by parent influences such as top scores, top colleges, and 'polish'.

People orientation, service orientation, empathy, and awareness of those in most need of care are also associated with graduates who are older, who have outside origins, and who choose health access careers⁴⁻⁸. Medical students with a narrow range of origins and top science focus may have slightly lower levels of some of the most important qualities for physicians. They may also have more difficulty relating to those most different who represent 65% of the lower and middle income population, and a similar proportion of the healthcare team members other than physicians. In many ways what is required from physicians is the ability to overcome their own unique experiential place to be best able to serve those who are different. This is a difficult requirement for any individual of any origin - but it may be most difficult for those from a narrow range of origins.

As Madison noted, medical education has moved steadily in the direction of the narrow over the past century. He also noted, 'If an admission committee informs itself of "what finally happens" to those it admits, its decisions can contribute to achieving whatever policy its medical school adopts with respect to the mix of physicians it wishes to produce'⁴. Until medical schools elevate their graduate outcome studies to top priority areas that can be used to shape admission, solutions for cost, quality, and access problems are not likely to be found.

Physician training outside

Physician distribution is further complicated by training in locations with top concentrations of physicians, health resources, and specialists. This even includes training of the family practice physicians who maintain a balance of 50% inside and 50% outside of concentrations. Training outside rarely involves specialists, and physician location outside is also rare.

Health policy outside

Current health policy awards the most lines of revenues and the highest reimbursement in each line to locations and careers with concentrations. Policy also shapes market forces, and both together shape career and location choices away from distribution outside. Only the most dedicated admission and training efforts can overcome policy effects that shape concentration.

The challenge of physician distribution

Physician distribution involves a common-sense approach to reverse concentrations in origins, in training, and in policy. This is a challenge because it is those inside concentrations who lead medical education who determine the origins of the students admitted to medical school, the training locations and curricula, and the policy influences. Physician distribution is complex because those inside must make the apparent sacrifices to achieve needed change, but they fail to realize that it is the populations outside who have been making sacrifices for generations. Medicine is a challenging profession, and learning to defer self-interest in favor of patients or populations in need of care remains the ultimate top priority area.

Testing distributional principles

A logistic regression using 294 256 medical school graduates of the classes of 1987-1999 as found in the



American Medical Association Masterfile⁹ can illustrate origins, admission, training, career choice, and distribution. This cohort of graduates is approximately 40% of the active workforce. These are the most recent classes to complete training and to distribute in a representative fashion. The principles of physician distribution can be tested using secondary data.

A place of origin factor, a medical school training factor, a physician characteristic such as an age factor, and a career choice factor can be loaded into a logistic regression equation to study physician distribution to locations outside concentrations. Types of training can be defined by 'distributional' medical education or a type of medical school with admission and training focused on family practice and distribution. Distributional medical schools focus more (or totally) on the individual students as related to their distribution potential. Distributional schools are very different from the medical schools that are designated by top rankings and have the highest Medical College Admission Test (MCAT) scores that best illustrate combinations of concentration in admission and training.

Rural locations outside concentrations with less than 75 physicians at a zip code have 30-120 physicians per 100 000 population, or 10% to 40% of the national average concentration of 300 physicians per 100 000. Rural locations outside concentrations are approximately 8% of the total workforce and represent some of the most difficult recruitment and retention challenges. It is important to understand that these studies illustrate a cross section, not the first time practice location choices or the early effects of obligations that overemphasize recruitment and minimize retention. With 40% of the workforce captured over multiple class years, recruitment and retention are captured in a proper balance.

- ◆ rural birth origins multiply distribution by 2 to 3 times (more for isolated or lower income origin)
- ◆ family practice multiplies rural distribution by 2.5 to 4 times (increasing in locations with fewer physicians)

- ◆ physicians over age 29 years at medical school graduation (approximately 24% of physicians) had 1.3 times odds ratios greater rural distribution
- ◆ distributional schools, such as osteopathic or distributional allopathic public schools, had 1.3 to 1.5 times odds ratios tacked on influencing distribution¹⁰.

One of the advantages of coding by physician concentrations is that outside is not limited to geographic origins. The urban dimension of distribution outside concentration can be illustrated. For urban locations with less than 75 physicians:

- ◆ physician origins known to be more likely lower and middle income such as African American, Hispanic, and lower income urban county birth multiply distribution to urban areas outside concentrations by 2 to 3 times
- ◆ family practice multiplies urban distribution outside by 1.6 to 2.2 times
- ◆ older graduates again had 1.3 times odds ratios greater distribution
- ◆ distributional types of medical schools had 1.3 to 1.6 times odds ratios of greater distribution, including historically Black medical schools, osteopathic schools, and distributional allopathic public schools.

Because several different logistic regression equations are required to demonstrate the various outside and inside factors for origin, training, age, and career choice, the ranges across different equations are shown. The inside and outside principles of concentration and distribution are upheld consistently. The odds ratios for underserved origin, training, and underserved practice location have also been confirmed in other studies¹¹.

Distribution levels are lower (0.5 to 0.8 odds ratios) for physicians with the most urban and highest income birth origins, those born in a city or county with a medical school, younger graduates, and graduates of top ranking medical schools by MCAT scores. Physicians not choosing family



Robert C Bowman
Co-North American Regional Editor
Rural and Remote Health

practice have three times odds ratios of inside location or location in a zip code with 75 or more physicians.

Logistic regression helps to separate interactions between variables. For example, osteopathic physicians are generally older graduates, are also the most likely to choose family practice, and also have birth origins outside at higher levels. With all of these factors loaded, the additional 1.3 multiplier is attributable to osteopathic training effect. When only one or two variables are loaded, the interpretations can be distorted. When loading only the osteopathic variable, the odd ratios attributable to osteopathic are inflated to 2 times, rather than the 1.3 odds ratios.

A very common error in career and location research is the failure to include important variables and controls. Studies that fail to include origin factors, training influences, and changes in career and location choice due to policy differences represent problem areas for workforce understanding.

To understand research involving physician distribution, the major factors must be understood as well as their relationships to one another and across dimensions of time and space and experience. There are also common variations that must be understood. As with most research the pursuit of 'outliers' leads to some of the most important findings and much improved awareness. Without support it is difficult to pursue basic concepts, much less outliers and understanding.

The next time you hear that physician distribution is not possible, you can counter with over a century of evidence. Then you can move on to the more important question of how physician distribution and health access can best be accomplished. Replicating programs is less important than replicating the principles of distribution. And by the way, when it becomes difficult to determine whether a practice location or a medical student is 'outside', then physician distribution has been achieved.

References

1. Association of American Medical Colleges. *Medical student education costs and student debt*. (Online) 2005. Available: https://services.aamc.org/Publications/showfile.cfm?file=version35.pdf&prd_id=121&prv_id=137&pdf_id=35 (Accessed July 2006).
2. McGaghie WC. Assessing readiness for medical education: evolution of the medical college admission test. *JAMA* 2002; **288(9)**: 1085-1090.
3. Nickens HW, Ready TP, Petersdorf RG. Project 3000 by 2000. Racial and ethnic diversity in U.S. medical schools. *New England Journal of Medicine* 1994; **331(7)**: 472-476.
4. Madison DL. Medical school admission and generalist physicians: a study of the class of 1985. *Academic Medicine* 1994; **69(10)**: 825-831.
5. O'Connor SJ, Trinh HQ, Shewchuk RM. *Determinants of service orientation among medical students*. Oxford, OH: Miami University Farmer School of Business; 2000. Available: www.sba.muohio.edu/management/mwAcademy/2000/38c.pdf (Accessed 1 August 2008).
6. Newton BW, Barber L, Clardy J, Cleveland E, O'Sullivan P. Is there hardening of the heart during medical school? *Academic Medicine* 2008; **83(3)**: 244-249.
7. Association of American Medical Colleges. *Minority Students in Medical Education: Facts and Figures XI*. Available: https://services.aamc.org/Publications/showfile.cfm?file=version12.pdf&prd_id=89&prvid=8 (Accessed 1 April 2003).



8. Harth SC, Biggs JS, Thong YH. Mature-age entrants to medical school: a controlled study of sociodemographic characteristics, career choice and job satisfaction. *Medical Education* 1990; **24(6)**: 488-498.

9. Medical Marketing Service I. *AMA Physician Masterfile*. (Online) 2005. Available: www.mmslists.com (Accessed 1 July 2005).

10. Bowman RC. Logistic regression and rural practice location. In: *Proceedings, Association of American Medical Colleges 2007 Workforce Conference*; 2 May; Washington DC; 2007.

11. Rabinowitz HK, Diamond JJ, Veloski JJ, Gayle JA. The impact of multiple predictors on generalist physicians' care of underserved populations. *American Journal of Public Health* 2000; **90(8)**: 1225-1228.
