A Report on the Research and Teaching Productivity of Pharmacy Faculty: Changes Over Time and Comparisons to Faculty of Other Health Professions

The 1980 Argus Commission Report, “Faculty Scholarship and Research: Their Importance to the Future of Pharmacy Education,” illuminated a great disparity of research productivity amongst the then existing 72 accredited pharmacy colleges/schools. A survey conducted by the 1980 Argus Commission found that only a small number of pharmacy colleges/schools had any significant faculty research as measured by external funding or reviewed publications. The report provided the first real benchmark for pharmacy research and scholarship and in retrospect can be credited for placing a new emphasis on the importance of faculty scholarship in academic pharmacy.

The 1980 Argus Commission used the amount of NIH funding awarded to institutions as one measure of faculty scholarship both within and among disciplines. Table V of the Argus Commission report included a comparison of FY 1978 NIH funding among components of higher education, including the health professions of medicine, dentistry, public health, veterinary medicine, and pharmacy. In that comparison of 1978 NIH funding, pharmacy had less than half the funding amount of dentistry, about 80 percent of veterinary medicine, and slightly more than one percent of medicine. Based on its examination of faculty scholarship and research both within pharmacy colleges/schools and comparison with other health professions schools, the 1980 Argus Commission stated that “Perhaps as many as three-fourths of all U.S. pharmacy colleges are not engaged in sufficient research activity to be considered successful.”

This Institutional Research Brief (IRB) examines if and how the scholarship and research performance of colleges/schools of pharmacy have changed since the 1980 Argus Commission report by examining NIH research funding of disciplines within pharmacy over the past eight years and by comparing NIH research funding in pharmacy to other health professions over the past 30 plus years. Additionally, the relative research and teaching productivity of pharmacy faculty to faculty colleagues in several other health professions is examined.

**METHODS**

Comparison of NIH funding among pharmacy disciplines: AACP has obtained and verified individual faculty NIH funding data since FY 1996 (October 1, 1995-September 30, 1996). Funding by discipline was obtained by assigning a pharmacy discipline to each individual funded faculty member using the AACP Faculty Roster and totaling up the research and training grant dollars awarded by discipline. NIH awards
given to deans for special programs (e.g., building grants, special programs) were not included in the disciplinary totals.

Comparison of NIH funding among selected health professions: Historical NIH funding data (FY1970-2003) was obtained from the NIH Office of Extramural Grants Awards website for dentistry, medicine, nursing, pharmacy, public health, and veterinary medicine. The NIH reports both the number and total amount awarded, and separates the number and total amount data into the following components: research grants, training grants, fellowships, contracts, and other. Only the number and amount of research grants awarded were used for comparing faculty scholarship and research among the professions.

It is important to note that the number and amount of pharmacy faculty grants reported by the NIH are not accurate. AACP staff follow up of published NIH reported funding data has revealed that pharmacy faculty awards are occasionally credited to other higher health profession disciplines, resulting in approximately a five percent underreporting of pharmacy faculty grants. This amounts to $5-10 million annually being credited to other academic units, primarily medical schools. Despite the known errors in NIH reported data for pharmacy, no adjustments were made in any of the NIH data presented in this research brief.

The number of full time pharmacy, medicine, dentistry, and veterinary faculty were obtained from public and internal association sources.

RESULTS

NIH funding of pharmacy disciplines, FY1996-2003: NIH funding of Pharmacy faculty increased 123 percent over the eight years that AACP obtained NIH funding for colleges/schools and individual pharmacy faculty. The funding of all the pharmacy disciplines increased over that time period (Figure 1). The largest amount of funding continues to be awarded to medicinal chemistry (MCHM), but the percent increases in funding over this time period have been greatest for social and administrative pharmacy (SADS) and pharmacy practice (PP).

The percent of full-time faculty who receive NIH funding each fiscal year varies significantly among disciplines. The percent of full-time pharmacy faculty holding an NIH grant has increased across all disciplines the past eight years, with approximately 30 percent of MCHM faculty and approximately 1.15 percent of PP faculty holding an NIH grant in FY 2003 (Figure 2). Full-time faculty positions in MCHM, biological sciences (BS), pharmacology (PCOL), and pharmaceutics (PCEU) have been relatively constant over the past eight years, while the number of SADS and PP faculty have significantly increased (Figure 3). Therefore, even though the absolute and relative numbers SADS and PP faculty holding NIH grants has increased over the past eight years, the percent of faculty funded in these disciplines has remained quite low.

Dentistry, nursing, pharmacy and veterinary medicine grant awards: In FY 1970, the amount NIH funding of pharmacy faculty grants was lower than dentistry and veterinary medicine faculty (Figure 4). Pharmacy NIH grants exceeded veterinary medicine from FY 1980-2000, then fell behind in FY 2001, but again exceeded veterinary medicine in FY 2002 and 2003. Dentistry faculty were awarded more NIH grant award dollars than pharmacy faculty
from FY 1970-2000, but for FY 2001-2003, pharmacy faculty funding exceeded NIH funding of dentistry faculty. Nursing faculty obtained insignificant amounts of NIH grant support until FY 1986, when the National Center for Nursing Research (NCNR) was established. The NCNR was elevated to the National Institute for Nursing Research (NINR) in 1993. NIH support for nursing research has increased greatly since 1986, but still lags behind dentistry, pharmacy, and veterinary medicine.

The number of grant awards to dentistry, nursing, pharmacy, and veterinary faculty does not parallel the amount of funding (Figure 5), as the amount is the product of both the number of grants and the amount awarded per grant. Dentistry received the most awards for FY 1970-1999, but since FY 2000, the numbers of awards to dentistry, pharmacy, and veterinary medicine faculty have been very similar, with pharmacy faculty receiving the most awards in FY 2003. Nursing faculty did not receive substantial numbers of NIH awards until FY 1986, but since that time, the number of awards has approximately quadrupled.

**Medicine and public health grant awards:** The addition of medicine and public health NIH funding to that of dentistry, nursing, pharmacy, and veterinary medicine requires a shift from a Cartesian-coordinate to a logarithmic-linear axis plot (Figure 6). Academic medicine receives in excess of 50 percent of the NIH’s extramural research budget, which translates to billions of dollars of support, rather than millions of dollars of support for the other health professions. Public health schools, though few in number, receive about 2.5 times as much support as pharmacy, and the average public health grant award is the highest of all the health professions (Figure 7).

**Faculty productivity:** It is not uncommon for academics to refer to research “opportunities” and teaching “loads,” even though faculty research opportunities would not exist without some instructional responsibilities. Excellent and productive teaching and research require time and effort from a faculty member, and have important outcomes: the education of productive and contributing members of society and the discovery of new knowledge or new applications of knowledge that benefits society. These outcomes are not directly measured, but instead faculty/student ratios, numbers of graduates, research dollars awarded, or numbers of publications are used as surrogate measures of faculty teaching and research productivity, because they are more easily measured, understandable, and provide information on academic unit productivity.

Comparative data were available for dentistry, medicine, pharmacy, and veterinary medicine. When measures of research and teaching productivity are normalized for the number of full-time faculty (FTF), the large research productivity disparity among the health professions become much smaller, while the measure of teaching productivity, student/FTF, demonstrates much greater differences between pharmacy and the other health professions (Table 1).

**DISCUSSION**

The 1980 Argus Commission recognized “…that the current status of scholarship and research activity in our colleges is considerably less than ideal.” The Argus Commission members based their conclusion on measures of NIH funding, both within pharmacy colleges and among other health professions.
Recent AACP staff analyses of member colleges/schools of pharmacy NIH funding has revealed that although a significant percentage of the total amount of NIH funding continues to be awarded to faculty at the top ten funded institutions (i.e., top 12 percent), the percentage of total NIH funding awarded to non-top ten colleges/schools has increased.\textsuperscript{8,9} Approximately 75 percent of the 83 fully accredited colleges/schools of pharmacy had at least faculty member receiving NIH funding in FY 2003, although the top 12 percent of those institutions receiving funding is higher for pharmacy than the other health professions, demonstrating that a relatively small number of institutions still conducts the majority of peer-reviewed, funded research (Table 1).

In summary, although significant disparity of research productivity among pharmacy faculty continues both at the discipline and institution level, pharmacy faculty research and scholarship appears to be more widespread today than 25 years ago, at the time of the 1980 Argus Commission report. Of the 64 pharmacy colleges/schools that received NIH funding in FY 2003, only two were not in existence in FY 1978, the most recent data analyzed by the 1980 Argus Commission. Thus 86 percent of the institutions in existence in FY 1978 had at least one faculty member with NIH funding in FY 2003.

If pharmacy faculty research productivity, and specifically pharmacy NIH funding, is going to continue to significantly increase in the future, it can only come from two sources, disciplines and programs. Pharmaceutical sciences (BS, MCHM, PCEU, and PCOL) NIH funding has more than doubled over the past eight years, but most of that growth has come from increased grant awards, not the number of grant awards. There is still room for growth, but it must come from mature and newly emerging programs which traditionally have not have a significant research focus, because at those institutions with significant a research focus, a majority of pharmaceutical sciences faculty already have one or more NIH grants. Given the difficulty in obtaining external federal funding, particularly if there is not a history or culture of scholarship in an institution, and given the lack of growth in the number of faculty in these pharmaceutical science disciplines for the past eight years, increases in disciplinary research productivity will probably occur only with changes in institutional culture and concomitant faculty turnover, not new faculty additions.

The percent of SADS and PP faculty receiving NIH funding has increased over the past eight years, but the absolute number of faculty in these disciplines with funding remains very low. Significant increases in pharmacy NIH funding will occur only if SADS and PP faculty, who together constitute over 60 percent of all full-time pharmacy faculty, are urged to apply for and become successful in obtaining NIH funding.
REFERENCES


Author: Kenneth W. Miller, Ph.D.

kmiller@aacp.org