Outcomes of Combined Internal Medicine–Pediatrics Residency Programs: A Review of the Literature

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ABSTRACT

Purpose. To evaluate the outcomes of combined internal medicine and pediatrics (IMP) residency programs using the published literature.

Method. A literature search was conducted using Medline. Published articles were categorized as research or non-research (commentary, program requirements, program descriptions). Research articles were summarized and the results grouped under ten outcome variables.

Results. Of the 32 articles located, 18 were research articles, of which only four had been published since 1993. All the research conducted was cross-sectional and most involved surveys of program directors (seven studies) or graduates (four studies). At the time the studies were conducted, 20–33% of IMP residents did not complete their combined training; attrition rates have not been documented recently. Approximately 80% of IMP graduates achieved certification in both specialties, one third subspecialized to some degree, and 80% provided care to both adults and children. One fourth of the graduates felt that more training was needed in ambulatory settings and less was needed in intensive care. Very few studies of the outcomes of IMP physicians were found.

Conclusion. The outcomes of IMP residency programs are important for health workforce policy, and this study documents a need for more extensive research on the outcomes of training programs for primary care physicians.

In the United States there remains no consensus on how best to train generalist physicians. For the past three decades, a family practice residency has been the predominant method of preparing physicians to care for all age groups. This model is now under an increasing challenge from two groups: nurse practitioners, who claim they can perform most functions of a family physician, and combined internal medicine–pediatrics (IMP) physicians, who claim that family practice (FP) physicians do not receive enough in-depth training in the care of adults and children.

Combined IMP residency programs were first started in the late 1960s as an alternative to FP, offering four years of training—two in internal medicine (IM) and two in pediatrics—for medical students interested in careers in primary care of all age groups. Some IMP faculty in the 1980s openly criticized FP, stating that applicants to their programs felt, “. . . disenchanted with family medicine training, which they consider too superficial and diffuse to be useful given the demands of medical practice.” A survey of IMP program directors in 1987 showed that many respondents were, “sharply critical of family medicine training.”

The tenor of the debate changed in the 1990s, with FP and IMP collaborating in national forums such as the Primary Care Organization Consortium, and both IMP and FP being advocated as different but equally viable methods of preparation for generalist practice. However, tension between the disciplines persisted. Coinciding with Balanced Budget Amendment caps on the numbers of funded residency positions at training institutions, IMP program directors were successful in convincing Congress to provide four years of graduate medical education (GME) funding from Medicare for IMP training. This initiative was not supported by FP organizations, which took the po-
position that GME funding should be available only for the amount of time needed to qualify for one specialty board. There is now potential that FP and IMP will have to compete for a limited number of generalist training positions. In addition, questions about the relative amount of Title VII federal funding for FP, versus other generalist options, are being raised by the Health Resources and Services Administration’s National Advisory Council of Primary Care and Dentistry.

During the 1970s, in contrast to the rapid expansion of FP programs, IMP grew slowly. Only four programs offered a total of nine positions in the National Resident Matching Program (NRMP) in 1980. Growth of IMP programs accelerated in the 1980s and 1990s, with 232 positions offered in 1988 and 446 in 2000. A comparison of IMP and FP statistics from the NRMP for 1990 to 2000 shows that the number of positions offered by IMP increased 63% (from 273 to 446), while those offered by FP increased 34% (from 2,393 to 3,206). Figures 1 and 2 show the NRMP’s trends for the last 11 years for IMP and FP in the numbers of positions offered, the percentages filled, and the percentages filled by seniors from U.S. medical schools. Starting in 1995, IMP exceeded FP in the percentage of first-year positions filled by U.S. medical school seniors and, while both programs have suffered declines in popularity among U.S. medical school seniors since 1997, in 2000 IMP filled 75.8% of positions with U.S. medical school seniors, compared with 57.2% for FP.

These figures must be viewed cautiously, because the NRMP does not reflect all residency positions available or filled. For instance, a count of IMP programs listed in the American Medical Association’s Graduate Medical Education Directory shows 477 IMP positions available in 2000 and 459 in 1999, approximately 6% more than are listed in the NRMP data. However, even if we assume that U.S. medical school seniors filled none of these NRMP-unlisted positions, the proportion of IMP positions filled by U.S. medical school seniors would still exceed that of FP by over 10%. Furthermore, the number of U.S. medical school seniors choosing IMP increased by 165% between 1990 and 1997 (versus 65% for FP) and declined by only 9.5% between 1997 and 2000 (versus 21.6% for FP). Among U.S. medical school seniors, the IMP to FP ratio (the
number choosing IMP divided by the number choosing FP) increased from .10 in 1990 to .18 in 2000; 15.5% of U.S. medical school seniors choosing either type of program in 2000 chose IMP, compared with 9.5% in 1990.

It is clear from NRMP’s data that interest in primary care among U.S. graduates has recently declined, and the majority of U.S. medical school seniors who desire a generalist career that allows them to care for all age groups still choose FP. It is also clear that increasing proportions of these graduates are opting for IMP training. The reason for this trend is not evident. As the number of IMP faculty at medical schools increases, it is possible they become more visible as role models to medical students, making the IMP career option more attractive. Prior research has demonstrated that one of the most important variables for predicting the proportion of students at a medical school who will choose FP is the proportion of faculty who are family physicians, and it is likely that faculty influence will affect medical students’ choices of IMP as well. Whether the relative success of IMP programs comes at the expense of FP programs is unknown.

Advocates of IMP programs present them to students as a primary care option that offers more in-depth training in outpatient and inpatient care of adults and children than does FP. Some literature claims that most IMP graduates practice primary care, obtain board certification in both specialties, provide care for all age groups in practice, are highly sought after, and fit well into managed care health systems. The validity of these claims has important implications for federal physician workforce policy. This review evaluated the outcomes of IMP programs using the available literature.

**METHOD**

We conducted a Medline search using the terms IMP, IMP residency, and combined IMP, and searched the references listed in each article for any publications not discovered in Medline. We read and classified each article as either a commentary or research. An article was considered research if it contained any data that were collected and analyzed. Research was classified as cross-sectional if data were collected at one point in time and longitudinal if data were collected at more than one time point to reflect time trends.

**RESULTS**

We found 32 articles: 18 were research articles, and 14 were commentaries, program descriptions, or program guidelines. Table 1 indicates their years of publication. Nine research studies were published in the 1980s, nine were published in the 1990s, but only four have been published since 1993.

Of the 18 research publications, three were abstracts or brief reports, and one was a letter to the editor. There were 16 cross-sectional surveys; seven of residency directors, one of IMP residents, four of IMP graduates, one of medical students at two medical schools, one of applicants to one program, one of faculty at one school, and one of patients at one practice. One study was a case report of two IMP programs that included data on graduates, another was a cross-sectional analysis of two group practices with a total of four IMP physicians, six family physicians, and one internist. Two articles and one abstract appear to have used data from the same survey of graduates. Table 2 summarizes the research publications.

**Differences between IMP and FP Training Requirements**

Table 3 lists the requirements for IMP and FP training programs. Combined IMP programs are required to provide more structured time in inpatient and intensive care experiences than are FP programs. FP programs are required to provide more extensive ambulatory care experiences, which are both structured and content-specific. FP requires rotations in maternity care, gynecology, surgical care, and orthopedics. In addition, time is required in sports medicine, otorhinolaryngology, urology, radiology, mental health, dermatology, and practice management. IMP residents alternate continuous assignments of three to six months at one of the two specialties. They usually do not have combined IM and pediatrics continuity clinics, but instead usually have an IM clinic one week and a pediatrics clinic the next, or one of each weekly.

**Adequacy of Ambulatory Training in IMP Programs**

The adequacy of IMP ambulatory training was last studied in 1987. IMP graduates were asked to rank recommended changes in their training programs. The three most commonly recommended changes were to increase the time in...
### Table 2

**Research Articles on Combined Internal Medicine–Pediatrics (IMP) Residency Programs by Year of Publication**

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Date Published</th>
<th>Study Type</th>
<th>Response Rate (%)</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shumway et al. (abstract)</td>
<td>1986</td>
<td>Cross-sectional (CS) questionnaire to 59 faculty at one school</td>
<td>90</td>
<td>Year of study not described</td>
</tr>
<tr>
<td>Greganti, Schuster</td>
<td>1986</td>
<td>Historical data from two programs with 36 graduates</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Peterson, Goldenberg</td>
<td>1987</td>
<td>CS residency director (RD) questionnaire in 1986 to 81 programs</td>
<td>83</td>
<td>Inactive programs not included</td>
</tr>
<tr>
<td>Friedman, Rolfe (letter)</td>
<td>1987</td>
<td>CS RD questionnaire in 1986 to 78 programs</td>
<td>72</td>
<td>Not clear whether inactive programs included</td>
</tr>
<tr>
<td>Shumway, Ferrari</td>
<td>1987</td>
<td>CS RD questionnaire in 1986 to 65 programs</td>
<td>88</td>
<td>Inactive programs not included</td>
</tr>
<tr>
<td>Martin (abstract)</td>
<td>1988</td>
<td>CS RD questionnaire in 1988 to 75 programs</td>
<td>73</td>
<td></td>
</tr>
<tr>
<td>Biro et al. (abstract)</td>
<td>1988</td>
<td>CS questionnaire to 88 IMP graduates and 41 pediatrics graduates</td>
<td>64 IMP</td>
<td>IMP grads from national sample, pediatrics sample not described, year of study not clear</td>
</tr>
<tr>
<td>Siegel et al.</td>
<td>1988</td>
<td>CS RD questionnaire in 1987 to 70 programs</td>
<td>79</td>
<td>Inactive programs not included</td>
</tr>
<tr>
<td>Ferrari, Shumway</td>
<td>1989</td>
<td>CS RD questionnaire in 1987 to 80 programs</td>
<td>84</td>
<td>Inactive programs not included</td>
</tr>
<tr>
<td>Biro et al.</td>
<td>1990</td>
<td>CS questionnaire to 112 IMP graduates in 1987</td>
<td>63</td>
<td></td>
</tr>
<tr>
<td>Schubiner, Mullan</td>
<td>1990</td>
<td>CS medical student questionnaire end of year three at two schools</td>
<td>70</td>
<td>Year of study not described</td>
</tr>
<tr>
<td>Sorum</td>
<td>1991</td>
<td>CS description of patients at one practice using billing system, and 1,001 patient questionnaires in 1988</td>
<td>40 (patient questionnaires)</td>
<td>Patients who had left the practice or who were inactive not surveyed; only one survey per household and staff decided who in the house to mail to</td>
</tr>
<tr>
<td>Schubiner et al.</td>
<td>1993</td>
<td>CS questionnaire to 593 IMP residents in 1989</td>
<td>54</td>
<td></td>
</tr>
<tr>
<td>Biro et al.</td>
<td>1993</td>
<td>CS questionnaire to 112 IMP grads of all programs and 41 pediatrics, 51 IM, and 41 FP grads from one program</td>
<td>64 IMP</td>
<td>National sample of IMP grads while FP, IM, pediatrics grads were from a single program, year of study not clear</td>
</tr>
<tr>
<td>Schubiner, Lannon, Manfred</td>
<td>1997</td>
<td>CS RD questionnaire to 85 programs in 1994</td>
<td>87</td>
<td></td>
</tr>
<tr>
<td>Onandy</td>
<td>1997</td>
<td>CS description of two practice settings using CPT coding and utilization data in 1994</td>
<td>NA</td>
<td>Utilization data included only patients in a major health plan (15% of the practice), FPs did not provide pediatrics inpatient care</td>
</tr>
<tr>
<td>Doucet et al.</td>
<td>1999</td>
<td>CS questionnaire to 56 IMP, 91 pediatrics, and 82 IM residency applicants at one school in 1996</td>
<td>67.7</td>
<td></td>
</tr>
<tr>
<td>Lannon et al.</td>
<td>1999</td>
<td>CS questionnaire in 1995 to 1,482 IMP grads who finished 1986–1995 and applied to and had credentials approved by either board</td>
<td>68</td>
<td>IMP grads who never applied to either board or whose credentials were not approved were not included</td>
</tr>
</tbody>
</table>
outpatient subspecialty rotations (32%), decrease the time in intensive care (25%), and increase the time allotted for ambulatory care experiences (24%). Thirty-one percent of those with separate internal medicine and pediatrics continuity clinics recommended combining them.

A survey of program directors in 1988\textsuperscript{25} found that between 1986 and 1988 the median number of months spent in ambulatory medicine rotations and in ambulatory pediatrics rotations decreased from three to two and from six to four, respectively. The number of programs requiring two half-day clinics per week (one each in internal medicine and pediatrics) decreased from 36% to 22%. Thus, while IMP graduates were recommending increased time in ambulatory training, programs were moving in the opposite direction. This issue has not been studied during the past decade. Current program requirements state that 33% of the two years of IM and 50% of the two years of pediatrics must involve ambulatory experiences, and one half day per week is required in continuity clinic throughout the four years.\textsuperscript{37}

### Table 3

<table>
<thead>
<tr>
<th>Combined Internal Medicine–Pediatrics Residency Program and Family Practice Residency Program Training Requirements</th>
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<tbody>
<tr>
<td><strong>Combined Internal Medicine–Pediatrics</strong></td>
</tr>
<tr>
<td><strong>Length</strong></td>
</tr>
<tr>
<td><strong>Internal medicine</strong></td>
</tr>
<tr>
<td>Institute</td>
</tr>
<tr>
<td>Subspecialties</td>
</tr>
<tr>
<td>Requirements, time unspecified</td>
</tr>
<tr>
<td>Emergency medicine</td>
</tr>
<tr>
<td>Intensive care unit/critical care unit</td>
</tr>
<tr>
<td>Ambulatory care</td>
</tr>
<tr>
<td><strong>Pediatrics</strong></td>
</tr>
<tr>
<td>Institute</td>
</tr>
<tr>
<td>Emergency medicine and acute care</td>
</tr>
<tr>
<td>Neonatal intensive care unit</td>
</tr>
<tr>
<td>Pediatrics intensive care unit</td>
</tr>
<tr>
<td>Newborn nursery</td>
</tr>
<tr>
<td>Subspecialties</td>
</tr>
<tr>
<td>Adolescents</td>
</tr>
<tr>
<td>Behavioral/developmental</td>
</tr>
<tr>
<td>Ambulatory</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Other requirements</strong></td>
</tr>
<tr>
<td>Orthopedics</td>
</tr>
<tr>
<td>Maternity care</td>
</tr>
<tr>
<td>Gynecology</td>
</tr>
<tr>
<td>Surgery</td>
</tr>
<tr>
<td>Dermatology</td>
</tr>
</tbody>
</table>
Selecting IMP Programs over FP Programs

A 1998 survey of fourth-year medical students at two Midwestern schools looked at specialty preference. Of 425 responding students, 71 listed IMP as one of their top three choices, 106 listed FP, and 51 listed interest in both. It is not possible to draw any conclusions from these data about whether IMP programs attract students who would otherwise select FP programs, because no follow-up was conducted to document the students’ final specialty selections.

IMP residents in training in 1989–90 were asked what other training programs they had considered. Of 318 residents responding, 34% had inquired about training in FP, 21% had applied to FP programs, and 14% had ranked FP programs. A similar number had been interested in pediatrics programs (36% inquired about, 22% applied to, and 18% ranked), but more had shown interest in IM programs (46% inquired about, 35% applied to, and 28% ranked). Six percent of applicants to one program in 1995–96 stated they had applied to FP programs. Few IMP residents who leave their programs opt for FP; most enter IM or pediatrics programs. This could be a matter of convenience, however, because it is easier to remain in an institution’s IM or pediatrics program than it is to switch to FP, even at the same institution.

It appears from the data available that IMP programs have attracted some students who otherwise would have chosen FP, but many students choosing IMP would be more inclined to enter IM or pediatrics if IMP were not available. This issue, however, has not been studied thoroughly or recently.

Characteristics of IMP Graduates

The most recent and comprehensive survey of IMP graduates found that 34% of IMP graduates were women and 12% were international medical graduates.

Attrition from IMP Programs

The problem of residents’ attrition from IMP residencies was recognized and reported in the 1980s but has not been studied since. Three surveys of residency directors found attrition rates of 36% of residents matriculating before 1983, 20.7% matriculating between 1980 and 1986, and 33% matriculating before 1986. A case report of two programs reported attrition rates of 27% from one (1977–1986) and 13% from the other (1982–1986). A fourth study of residency directors asked about matriculates prior to 1986 and estimated an attrition rate of 31%.

The majority (60–84%) of residents leaving IMP programs transferred to categorical IM or pediatrics programs. Several authors have commented on the different cultures of IM and pediatrics and the stress residents report when they change from one specialty block of training to the other, but the cause of the 20–36% attrition rate is unknown. It is also unknown whether this rate of attrition continued into and through the 1990s. Reynolds and colleagues claimed in 1994 that the IMP attrition rate had declined to 12%, but the data source cited would not permit such a calculation because it involved data on residents’ leaving residency during only one year.

Dual Board Certification

The proportion of IMP graduates who achieve board certification in both IM and pediatrics could not be determined with certainty. Several difficulties are apparent when attempting to study it. First, there is no specialty board or other agency that tracks combined IMP graduates. Graduates must apply to two separate and freestanding specialty boards. In addition, IMP graduates may put off attempting to pass one or both board examinations, leading to delays that can add up to years after their residencies before both board certifications are achieved. Studies that involve recent graduates may, therefore, underestimate the eventual dual board certification rate.

Studies that have looked at this question have included surveys of residency directors, surveys of residency graduates, and case reports of individual programs. Two surveys of residency directors conducted in the 1980s indicated that IMP graduates who took either the IM certifying examination or the pediatrics examination achieved pass rates equal to or higher than those of graduates of IM and pediatrics categorical programs. It is unclear from these studies, however, how many attempted and passed both exams.

In a case report of two programs, again published in the 1980s, 44% of the graduates had achieved certification in both specialties, and the author estimated that this figure would eventually reach 75% for this cohort, although no specific formula was provided to justify this estimate. A survey of IMP graduates completing training before 1986 showed that 77% had become board certified in IM and 48% in pediatrics. Another 37% had passed the pediatrics written examination and were waiting to take the oral examination.

The only study of this issue in the 1990s looked at 1,482 graduates who completed training between 1986 and 1995. The authors found that 81.6% reported certification by both boards. However, the sample contained only those who had applied for certification to either board; graduates who had applied to neither board were excluded. No data were available on the numbers of graduates during the years included in the study.

Recertification is an issue that has not been studied. It is therefore not known what proportion of IMP physicians who obtain certification in both IM and pediatrics will maintain their diplomate status with both boards.
Subspecialization

One of the advantages of IMP training is the graduates' ability to continue training in a subspecialty, in either IM or pediatrics. While this is an advantage to the graduates, it is not necessarily an advantage for the health care workforce, in that it reduces the pool of primary care physicians. The degree of subspecialization of IMP graduates thus becomes an important question when evaluating the outcomes of IMP training.

A survey of IMP graduates finishing training before 1986 indicated that 16% practiced a subspecialty and 20% combined a subspecialty with primary care practice.2,26 Thirty-two percent had pursued fellowship training. The most recent survey of graduates found 33% reporting clinical activity or formal training in a subspecialty and 31% reporting 20% or more of their time in a subspecialty.28

Residency directors in 1987 stated that 32% of their graduates had entered fellowships.1 A similar survey in 1988 indicated that a lower proportion (17%) had pursued fellowships.25 Another survey of directors asking about graduates completing training between 1987 and 1993 indicated that 68% of 707 graduates were generalists and 21% subspecialists.23 In 1990, 21% of IMP residents responding to a survey planned subspecialty practice.22

Providing Care for Both Adults and Children

Two surveys of residency directors have provided similar results on the proportion of IMP graduates providing care for both adults and children. In 1987, Friedman and Rolfe1 found that 61 of 108 graduates (56%) were reported to be practicing primary care, and an additional 23 residents had entered a combined IMP fellowship. In a 1988 survey,23 63% of graduates were reported to be practicing both IM and pediatrics, and another 17% had entered an IMP fellowship (all but one of these had gone into academic medicine). The unknown in both studies is what proportion of those entering fellowships went on to practice both adult and pediatric medicine. In a survey of directors asking about graduates who finished between 1987 and 1993, the directors reported that 77% of these graduates were treating both adults and children as either generalists or specialists.23

In the survey of IMP residents of 1989–1990, 64% of responders planned primary care careers that involved providing care to both adults and children.2 Another 13% planned combined IMP fellowships. The survey of graduates finishing training before 1986 found 83% caring for adults and children; 64% were in primary care, but the proportion caring for all ages was unknown. The most recent survey of IMP graduates did not answer this question. It was reported that 70% of graduates spent at least 70% of their time in direct patient care and that, of those active clinically (undefined), 4% saw no children under the age of ten and 6% saw no adults older than the age of 60.15

Practices and Competencies of IMP Graduates

Biro and colleagues looked at all IMP graduates who completed training before 1986 and compared their responses with those of FP, IM, and pediatrics graduates from a single program.26 The IMP graduates expressed more comfort than did the FP graduates in caring for premature and small-for-dates infants, toddlers with fever complicated by seizure, acute myocardial infarction (MI) with complications, and an elder with hip fracture complicated by syncope and chest pain. They felt less comfortable than did FP graduates with high school sports physicals and depression. They also felt less comfortable than did IM graduates in the management of acute MI with complications, an elder with hip fracture and complications, and a geriatric patient with memory loss. These findings should be viewed with caution, since the comparison was between IM and FP residents from a single program and the results could reflect that training program's strengths and weaknesses more than specialty-specific training in general. In the same survey the distributions of patients seen by FP and IMP graduates were very similar, with FPs seeing slightly fewer children and more elderly.

We found no study that looked at whether IMP graduates or other primary care physicians are preferred by any type of practice group or setting. One author claimed that IMP physicians have the lowest rate of unemployment of all primary care physicians,26 but the reference cited to support this claim contained no data on or mention of IMP physicians.38

The most recent survey of graduates found that 54% of IMP physicians were in community office practices and 27.5% were in hospital practices (7.3% in emergency departments).32 Seventy percent practiced some inpatient IM and 69.7% practiced some inpatient pediatrics; however, only 50.9% practiced in intensive care units (ICUs), 38% in cardiac care units (CCUs), 19.5% in pediatrics ICUs, 30% in nursing homes, and 41.5% in level-1 or level-2 nurseries. These findings contrast to those of Schubiner and colleagues, who found that 91% of IMP residents expected to practice inpatient medicine and 92% expected to practice inpatient pediatrics.22 Only 24% did not expect to work in an ICU and a CCU, and 32% did not expect to work in a pediatrics ICU. Over half did not expect to do casting of simple fractures (54%) or diaphragm fitting (52%).22

We found only two studies of IMP practices. The first study24 involved two locations with a total of four IMP graduates, six FPs, one physician's assistant, and one internist. The FPs cared for a larger proportion of geriatric patients
than did the IMPs (12.1% versus 5.8%), and the IMPs cared for more children, especially in the hospital, since the FPs did not provide pediatrics hospital care. Both IMPs and FPs had lower referral rates than did comparable physicians in the community. The second study looked at a small practice of two attending physicians and two residents with 100–120 patient visits per week. The practice was popular with patients; 56% rated it as excellent, 34% as very good. The distribution of ages in the practice was somewhat bimodal, with 24% of the patients less than two years of age and 34% between 18 and 39 years of age. Patients who had left the practice were not surveyed. These two studies are too limited in scope to suggest any definitive or generalizable conclusions.

**IMP Practice Settings**

Ferrari and Shumway found that in 1988 35% of IMP graduates practiced primarily in academic medicine, and 65% of these graduates were practicing primarily in the private sector, although the term “private sector” was not defined or broken down further. Of those in academic practice, 47% had received subspecialty fellowship training. Kimball reported that a 1997 American Board of Internal Medicine survey of 900 IMP graduates showed 88% in group practice with other physicians (51% with general internists, 42% with pediatricians, 40% with family physicians, 38% with other IMP physicians, 21% with pediatrics subspecialists, and 29% with IM subspecialists). The method used, response rate, and actual data of the survey were not published. Lannon et al. found that 30% of IMP physicians were in a group practice that included other IMP physicians (31.6% were with FPs, 41% with general internists, and 32.8% with general pediatrics). Ten percent of the IMP physicians were in solo practice, 20% practiced in hospital settings, and 50% had faculty appointments, of whom 31% (15.5% of the total) had full-time salaried positions at medical schools.

**IMP Practice Locations**

The only study of the geographic locations of IMP graduates was the survey of 1986–1995 graduates by Lannon and colleagues. Fifty-eight percent of the responders were located east of the Mississippi: 23% were in cities of greater than one million, 34% in cities of 100,000–999,000, 15.3% in cities of 50,000–99,000, 20.1% in towns of 10,000–49,000, and 6.6% in communities of 10,000 or less.

The reported geographic locations of graduates are similar to those of the IMP training programs. Fewer than 10% of IMP residency programs are located in towns of less than 50,000, and over two thirds are in cities of 200,000 or more. Eighty-four percent of the programs that responded to the two studies were located east of the Mississippi.

**DISCUSSION**

From the data presented, we can conclude that IMP programs have grown in number and in the positions they offer, and that they continue to fill with a high proportion of U.S. medical school seniors while other primary care specialties have experienced relative declines in popularity among U.S. students. The research on the outcomes of IMP training is not extensive: there is an over-reliance on cross-sectional surveys of residency directors, and many of the studies have methodologic flaws. Most of the research was conducted before 1993, and it is unknown how many of the findings still apply. There is very little documentation of the actual practices of IMP graduates and no study of practice outcomes. No true comparison of the competencies of IMP graduates with those of other specialists such as internists, pediatricians, and family physicians has been conducted. The publications on the day-to-day activities of IMP graduates involve only two practices.

The literature indicates that IMP programs have attracted some students who otherwise would have entered FP, but this issue has not been studied recently. The literature indicates that, at least in the past, IMP programs suffered attrition rates of 20–36%. There is no recent study of this issue. When IMP graduates take either IM or pediatrics specialty board examinations, they pass at rates at least equal to those of IM and pediatrics graduates. Rates of passing both boards are reported to be as high as 81.6%, although this figure might be slightly inflated by the method used. It appears that a high proportion of IMP graduates provide care for both adults and children as either primary care physicians or subspecialists. Nearly one third of IMP physicians practice solely or partially in subspecialties. From the evidence available, it appears that the bulk of IMP graduates enter group practices and that these practices are in collaboration with a wide variety of other physicians. A relatively high proportion of IMP graduates enter academic practice although, compared with the 1980s, this proportion declined in the 1990s.

Given what the research shows about the outcomes of combined IMP training, what are the implications for medical students interested in IMP as a potential specialty choice and for the health-workforce needs of the country? For medical students who are interested in practices that include both adults and children, IMP is one of several choices and one that allows the opportunity to subspecialize. Students will be able to pass both IM and pediatrics board examinations after their IMP training. However, many will not receive the amount of ambulatory training they would like, and half will not subsequently practice in intensive care settings. For the group as a whole, if we use an attrition rate of 20%, a dual
board certification rate of 81%, and a subspecialization rate of 33%, and if we assume that 80% of IMP graduates will provide care to both children and adults (the most favorable assumptions allowed by the literature), a medical student entering an IMP program has a 65% chance of becoming certified by both boards (80% program completion times 81% dual board certification), a 54% chance of practicing primary care IMP (80% completion rate times 67% primary care rate), and a 64% chance of providing care to both children and adults (80% completion rate times 80% providing care to both). It is possible that current IMP attrition rates are lower than in the past, which would adjust each calculation upward. There is a need for IMP program directors to study and document current attrition rates.

It appears that IMP physicians will do little to alleviate the geographic mal-distribution of physicians. Few practice in small communities. It is unknown how many practice in urban underserved areas. There are some specific primary care needs that IMP will not meet, since less than a third of IMP graduates provide care in nursing homes and by definition they do not provide prenatal or obstetric care. To the extent that students choose IMP over IM or a non–primary-care specialty, there is a net primary care gain, since the IMP subspecialization rate appears below that of IM, reported to be 55%. The IMP subspecialization rate is similar to that of pediatrics graduates. To the extent that U.S. students choose IMP in lieu of FP, there appears to be a net primary care workforce loss since 91% of FP graduates practice primary care, 30% practice in small communities, and, in California, they practice in urban underserved areas at higher rates than do other physicians.

What is the impact of the loss of U.S. medical school graduates who were potential FP residents but who selected IMP residencies instead? While it is true that FP residency positions unfulfilled by U.S. graduates may be filled by IMGs, it is not known whether the IMGs will locate their practices in rural and underserved areas in the same proportion as U.S. graduates, and there is some evidence that IMG matriculants in FP residencies have a much higher attrition rate than do U.S. graduates (18.5% versus 7.8%). Thus, potentially, there is a loss of physicians who would have practiced in rural areas. However, it is also possible that U.S. students interested in generalist practice but who do not want to practice in rural areas simply choose IM rather than FP, in which case there is no net effect on the geographic distribution of physicians.

These unanswered questions are important to federal physician-workforce policy, and they document a need for further and more rigorous research on the outcomes of training programs for primary care physicians. We need longitudinal studies of career choices to assess the impacts of different training options on the health workforce and studies looking at costs and outcomes to define better the best types of training for different practice settings. This is particularly important given that IMP and FP training programs may be competing for the same pool of federal money designed to improve the primary care/specialty mix and the geographic mal-distribution of physicians in the United States.

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