Objective: To assess the respective roles of general pediatricians and pediatric subspecialists in the provision of primary pediatric care.

Design and Methods: A practice characteristics questionnaire that included questions about primary care was sent to a random sample of 1616 board-certified and board-eligible active Fellows of the American Academy of Pediatrics; 1145 (70.9%) responded. Analyses pertain to those pediatricians who provided ambulatory patient care and were not in graduate medical education training at the time of the survey. Respondents were divided into 2 groups for purposes of analysis: the 527 pediatricians whose practice was primarily in general pediatrics (defined as 80% of time spent in general pediatrics or any time spent in adolescent medicine) and the 213 pediatricians whose practice was subspecialty focused (all others). These groups were then further stratified according to whether they provided primary care. The resultant subgroups contained 518 general pediatricians and 98 subspecialists who provided primary care.

Results: Among the entire sample, general pediatricians indicated that general pediatricians provide 93% of the primary care delivered by their practice and that pediatric subspecialists provide 2% of the primary care. In contrast, pediatric subspecialists reported that general pediatricians provide 53% of the primary care delivered by their practice and that subspecialists provide 32% of such care (P<.001). Among the subsample of pediatricians who provide primary care, general pediatricians reported delivering 88% of the primary care received by their patients and subspecialists reported delivering 74% of the primary care received by their patients (P<.001).

Conclusion: Perspectives on the degree to which pediatric subspecialists provide primary pediatric care vary depending on generalist vs subspecialist self-identification.


Editor’s Note: Because most pediatric subspecialists in the United States practice in academic medical centers, I wonder how they, as a group, would answer the survey.

Catherine D. DeAngelis, MD

Pediatric subspecialists’ contributions to the provision of primary care for children has received little attention from researchers. From the standpoint of the aggregate pediatric workforce, the extent to which pediatric subspecialists provide general pediatric care to the overall child population has not been adequately studied. Moreover, the degree to which pediatric subspecialists serve as the primary care physicians for their subspecialty patients (ie, those patients who are cared for by a subspecialist because of a chronic illness or other subspecialty problem) also remains a matter characterized more by subjective views than by objective data.

From the standpoint of pediatric workforce assessment, the matter is not a trivial one. Results of more broad-based studies of provision of principal care among physicians have demonstrated that physicians in all specialties are the principal providers of care to substantial portions of their patients. Moreover, many specialists dedicate substantial percentages of their overall clinical activity to patient encounters in the ill-defined “principal care” category. If such trends as those described for adult specialists hold true for pediatric subspecialists, then the contribution made by pediatric subspecialists to primary care for children may be considerable.

One of the factors hampering research in this area is that arriving at a conventional definition of “pediatric subspe-
PARTICIPANTS AND METHODS

PARTICIPANTS

A practice characteristics questionnaire that also included questions about the delivery of primary care was sent to a random sample of 1616 of the 38,000 board-certified and board-eligible US active Fellows of the American Academy of Pediatrics in 1993 (Periodic Survey No. 21). The original and 4 follow-up mailings resulted in a response rate of 70.9% (n = 1145), which is considered a high response rate for a mailed questionnaire.3 The analyses presented in this report pertain to pediatricians who specified that they provided ambulatory patient care and were neither in pediatric residency training nor in a subspecialty fellowship. The respondents were divided into 2 groups: the 527 pediatricians whose practice was primarily in general pediatrics (80% of time spent in general pediatrics or any time spent in adolescent medicine) and the remaining 213 pediatricians whose practice was primarily in subspecialty pediatrics (Table 1). We elected to include within the general pediatrician group all of those physicians who dedicate time to the practice of adolescent medicine because adolescent medicine, although a certifiable subspecialty, constitutes, in our judgment, a generalist discipline (albeit to an age-specific patient population).

The 2 principal groups were further broken down according to whether they provide primary care (according to self-report). The resulting 2 subgroups comprised 518 general pediatricians and 98 subspecialists who deliver primary care. In addition, because the proportion of primary care delivered by any particular physician may be dependent on the availability of other physicians to also deliver primary care, general pediatricians and pediatric subspecialists were further divided into those who work with both general pediatricians and pediatric subspecialists and those who work in practices without pediatric subspecialists.

MEASURES AND DEFINITIONS

The survey instrument included several questions pertaining to the respondents' employment status, their time allocation to various duties, the nature and scope of their practice, their patients' demographic characteristics and medical needs, and their own demographic characteristics. Within the instrument itself, the following definition of primary care was provided, along with the explanation that this definition would hold true for purposes of the questionnaire items that referred to primary care: "Provision of comprehensive, continuous health care services that promote and preserve health, and prevent and treat disease, injury and dysfunction, usually at the point when the patient first seeks assistance from the medical care system. Such services include health supervision and evaluation, anticipatory guidance, and treatment of more common illnesses."

Pertinent to this analysis, respondents were asked to estimate what proportion of the primary care delivered to pediatric patients in their practice was provided by general pediatricians, pediatric subspecialists, or other physicians who care for children. Specifically, they were queried, "Approximately what percent of all the pediatric primary care that is delivered by physicians in your main practice/office location is provided by the following?" Following the question, a list including general pediatricians, pediatric subspecialists (certified or noncertified), family and general practitioners, and other specialists was shown, with blank spaces beside each provider category, along with a notation that the total needed to be 100%. Respondents were also asked to estimate how much of the primary care delivered to their own patients was provided by themselves and how much was delegated. The questionnaire item read, "In your main practice/office location, during a typical full week of practice, what proportion of the primary care of your patients only is delivered by YOU and what proportion is DELEGATED to other medical personnel?" In addition, respondents were asked to report how many full-time and part-time general pediatricians, pediatric subspecialists, and other physicians who care for children work at their practice. For these analyses, part-time physicians were counted as half of a full-time physician.

STATISTICAL ANALYSES

Subsample means were derived for each response item within each pediatrician category included in the sample. Comparisons between the estimates of primary care delivered by the different pediatricians were then assessed using 2-tailed t tests for equality of means. Ordinary least-squares multiple regression analysis was used to compare the percentage of primary care delivered by pediatric subspecialists, while controlling for the ratio of pediatric subspecialists to the total number of physicians who care for children in the practice, and specialty of the responding pediatrician. A software program (SPSS for Windows, SPSS Inc, Chicago, Ill) was used to perform the statistical analyses. For purposes of the regression analysis, we excluded the 2 respondents who reported that 100% of the primary care in their practice (composed of general pediatricians and pediatric subspecialists) was delivered by pediatric subspecialists.
from a recent round of the Periodic Survey of Fellows of the American Academy of Pediatrics. The aim of our research was to assess the respective roles of general pediatricians and pediatric subspecialists in the provision of primary pediatric care. We sought to ascertain differences between general pediatricians and pediatric subspecialists in their respective self-reported allocation of time devoted to general pediatrics, as well as their perspectives on one another’s contributions to primary care, from both a group practice–based vantage point and an individual perspective.

RESULTS

Sampling frame information and demographic and descriptive practice characteristics are presented in Table 1. Characteristics of respondents to Periodic Survey No. 21 are similar to those of respondents to other recent periodic surveys.6

From the entire sample, general pediatricians indicated that they and their general pediatrician partners provide 93% of the primary care delivered by their practice and at the same time reported that the pediatric subspecialists in their groups provide 2% of the primary care delivered by the practice. In direct contrast to these estimates, pediatric subspecialists reported that general pediatricians provide 53% of the primary care delivered by their practice and that subspecialists provide 32% of such care (P < .001) (Table 2). These estimates change slightly depending on whether the respondent was in practice exclusively with general pediatricians. General pediatricians who practiced in a group that did not include subspecialists estimated the primary care contribution of subspecialists to compose less than 1% of the total primary care provided by the practice, whereas generalists who practiced alongside subspecialists reported that 8% of primary care was provided by subspecialists (Table 2). Pediatric subspecialists who practiced with a group consisting of general pediatricians (and that did not include additional subspecialists) estimated the primary care contribution of subspecialists to compose less than 1% of the total primary care provided by the practice. In contrast, subspecialists who practiced alongside both general pediatricians and other subspecialists reported that 30% of the primary care delivered by their practice was provided by subspecialists (Table 2).

Among the subsample of pediatricians who reported themselves to be providers of primary care, general pediatricians reported that they deliver 88% of the
primary care received by their patients (Table 3). By comparison, the subspecialists who deliver primary care reported delivering 74% of the primary care received by their patients \((P<.001)\) (Table 3). The estimated percentages of primary care delivered by general pediatricians and pediatric subspecialists to one’s individual patients were stable across practice structure and composition for general pediatricians but varied considerably for subspecialists depending on respondents’ practice organization and composition. All the general pediatricians, whether they practiced in a group that did or did not include subspecialists, reported providing nearly 90% of the primary care their patients received. The pediatric subspecialists who practiced in a group consisting of general pediatricians (and not including additional subspecialists) estimated that they provide 88% of the primary care their patients receive. By contrast, subspecialists who practiced in groups comprising general pediatricians and additional subspecialists reported that they provide 68% of their patients’ primary care (Table 3).

We examined further the relationship between the availability of other providers of primary care and the proportion of primary care delivered by pediatric subspecialists by calculating a ratio of pediatric subspecialists to the total number of physicians who provide care for children in the practice and regressing this ratio on the estimated percentage of primary care provided by pediatric subspecialists. Because we have already seen that this reported percentage differs sharply depending on one’s own self-definition, we also included in the regression analysis whether the respondent was a general pediatrician or a pediatric subspecialist. In practices that had both general and subspecialty pediatricians, the average ratio of pediatric subspecialists to the total number of physicians providing care to children was 0.323. The average estimated percentage of primary care delivered by pediatric subspecialists in these practices was 14%. Table 4 presents the results of multiple regression analysis. For every 10% increase in the ratio of subspecialists to total physicians there was a gain of 3.6% in the proportion of primary care provided by subspecialists. A practice with a ratio of pediatric subspecialists to total physicians of 0.5 (half the physicians are pediatric subspecialists) would have 7.2% more of the primary care delivered by those subspecialists than in a practice in which the ratio was 0.3. No matter the ratio within the practice, general pediatricians reported 12.6% less primary care delivered by pediatric subspecialists than the subspecialists reported. Overall, these 2 variables explained 36% of the variance in the estimated proportion of primary care delivered by pediatric subspecialists.

Our data indicate that perspectives on the degree to which pediatric subspecialists provide primary care vary depending on one’s self-identification as a general pediatrician or a pediatric subspecialist. Discrepancies between generalists and subspecialists in their respective estimates of primary care provision held true for “group effort” (ie, practice-level provision of care) and individual effort regarding physicians’ own patients. Pediatric subspecialists—whether or not they themselves provide primary care—estimated that a significantly higher percentage of aggregate primary care (ie, primary care provided by the group) is provided by subspecialists than did general pediatricians. Pediatric subspecialists credited themselves and their colleagues for considerably greater provision of primary care than did their generalist colleagues.

The divergence in perspectives on relative contributions to overall primary care at the aggregate group (or practice) level could be explained in any of several ways, or by a combination of factors. It is possible that general pediatricians are unaware of the full scope of services (including primary care services such as those included in the definition of primary care provided to respondents) that subspecialists provide. Alternatively, subspecialists may underestimate the total amount of primary care services received by the children in the practice, thus resulting in a relative overestimation of subspecialists’ contributions. A third explanation may relate to divergent definitions or conceptualizations of primary care between generalists and subspecialists.

With respect to individual-level provision of primary care services to one’s patients, the striking finding is the high percentage stated by all pediatricians who identify themselves as providers of primary care, be they general pediatricians or subspecialists. Although the number of pediatric subspecialists in this category is

<table>
<thead>
<tr>
<th>Provider</th>
<th>General Pediatricians</th>
<th>Pediatric Subspecialists</th>
<th>(t)</th>
<th>(P)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Providers of primary care</td>
<td>88 (0.75)</td>
<td>74 (3.45)</td>
<td>-3.97</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Practice with general pediatricians only</td>
<td>89 (0.82)</td>
<td>88 (2.54)</td>
<td>-0.04</td>
<td>.97</td>
</tr>
<tr>
<td>Practice with both general pediatricians and pediatric subspecialists</td>
<td>88 (1.88)</td>
<td>68 (6.19)</td>
<td>-3.20</td>
<td>&lt;.003</td>
</tr>
</tbody>
</table>

* Percentages are rounded to the nearest integer.
† General pediatricians are defined as those who spend 80% or more of their time in general pediatrics or any time in adolescent medicine.

Table 3. Percentage (SE) of Primary Care Delivered to One’s Own Patients

Table 4. Results of Multiple Regression

<table>
<thead>
<tr>
<th></th>
<th>Coefficient</th>
<th>(t)</th>
<th>(P)</th>
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<tbody>
<tr>
<td>Ratio of pediatric subspecialists to total number of physicians</td>
<td>35.72 (7.38)</td>
<td>4.83</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Specialty of physician†</td>
<td>-12.60 (3.69)</td>
<td>-3.41</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Constant</td>
<td>10.57 (4.13)</td>
<td>† † †</td>
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</tbody>
</table>

*Values in parentheses are SEs.
† Subspecialists coded 0; general pediatricians coded 1.
†Ellipses indicate not applicable.
small, this group's estimate of their contribution is comparable with general pediatricians' estimates of their own contribution. These results might be explained by selection bias; ie, those pediatricians who define themselves as primary care providers credit themselves as the providers of most of the primary care that their patients receive.

Our sample includes only those pediatricians who are members of the American Academy of Pediatrics (and excludes those who do not belong to the Academy). Additional limitations of our study include its dependence on self-reports for categorization (ie, generalist or subspecialist identification), the subjective nature of the responses, the possibility of recall bias affecting estimates, the current social and economic desirability of being a provider of primary care, and the inherent inability (based on the above factors) to determine which category of pediatricians is more accurate in its assessments. The subjective nature of responses could be a problem in several respects. Not only were the clinicians asked to quantitatively estimate various contributions to primary care service provision but they also might have subjectively interpreted—on a qualitative basis—primary care. Defining primary care has been an ongoing challenge for the medical community. Although many such definitions have been proposed, no consensus has yet developed as to the universal adoption of any single definition. Respondents, therefore, may have interpreted the definition provided in the survey instrument in an inconsistent fashion.

WHEREAS the definition of primary care included in Periodic Survey No. 21 incorporated the concepts of first-contact care, comprehensiveness, and continuity, the definition lacks other attributes considered essential by some. Starfield, for example, listed the defining characteristics of primary care as first contact, longitudinality, coordination, and comprehensiveness. The American Academy of Pediatrics itself (subsequent to the design of Periodic Survey No. 21) defined pediatric primary care as accessible, affordable, first contact, continuous, comprehensive, coordinated, and family centered. In contrast with the definitions of Starfield and the American Academy of Pediatrics, the definition included in the survey instrument is broader and comparatively loose, ignoring the coordination function and specifying only marginally the longitudinal aspect. Thus, the definition provided to respondents tends to overestimate rather than underestimate the amount of primary care provided by subspecialists.

Although these data provide novel insight into perceived differences regarding "who provides how much primary care," they do not allow for definitive conclusions about which perspective is more accurate. Indeed, it may be that neither perspective is entirely correct and that instead the truth lies somewhere in the middle. This might imply that the general pediatrician–pediatric subspecialist dichotomy is a false one. It is likely that some degree of misunderstanding and underappreciation for the contributions of others (relative to one's own efforts) probably color the perceptions of generalists and subspecialists alike. A further limitation of our study concerns its generalizability. We included in our analysis only those subspecialists who provide ambulatory care, thereby excluding a large fraction of pediatric subspecialists (eg, neonatologists, pediatric intensivists, and hospital-based subspecialists). However, we consider these subspecialists to be unlikely providers of primary care.

These findings have implications for pediatric workforce supply estimation, although the implications may vary depending on the conclusions drawn from our data. The total number of pediatric subspecialists in office-based practice was approximately 2259 in December 1995. If the subspecialist respondents to our survey are accurate in their perception of the amount of primary care they deliver, then such physicians should be counted as "approximately 0.3 general pediatrician equivalents" for purposes of workforce estimates (aggregate general pediatrician supply estimation). This would add the equivalent of approximately 700 general pediatricians to the national primary care pediatrics provider "pool" (or general pediatrician supply). If, on the other hand, the general pediatrician respondents' answers are more accurate, then office-based pediatric subspecialists should be counted in an entirely separate (subspecialist) category of providers that contributes negligibly (0.02) to primary care service delivery. Some limited empirical data (from process and content factor analysis) indicate that general pediatricians are primary care providers to a much larger degree than are pediatric subspecialists, but unfortunately these data are derived from a small sample of physicians. Until more definitive data are available, workforce planners might consider using a midpoint estimate (0.16-0.17).

Sixty percent of pediatric subspecialists practice in academic health centers (compared with <33% of adult subspecialists). Among sub-board-certified pediatric subspecialists, only 59% of their time is spent in direct patient care (with the remainder of their effort being directed at research, teaching, and administration). Moreover, variation exists across the various pediatric subspecialties with respect to time allocation to clinical activity. Because of these factors, defining a "clinical full-time equivalent" pediatric subspecialist remains elusive, thus thwarting subspecialty-specific workforce estimation.

Current market forces seem to be pushing many pediatricians in the direction of general pediatrics practice. Recent data from the American Board of Pediatrics reveal a decline in the number of trainees pursuing pediatric subspecialty fellowships. The Board reports that among residents taking the General Pediatrics Certifying Examination, declining percentages intend to pursue subspecialty fellowship training. Other authors report trends among pediatric subspecialists to "revert" to general pediatric practice to a large extent over time or to include general pediatrics as part of their practice. Although market forces may be pushing many subspecialists into generalism, so also may market forces be pushing general pediatricians to develop subspecialty
“interest areas” (within large groups, health maintenance organizations, etc, or simply to stake out a market niche). Consistent with this notion, a growing body of literature indicates that generalist and specialist practice patterns are overlapping and decidedly indistinct.10,12-15 These recent trends may translate into our research questions being moving targets; ie, that estimates of the relative contributions of the pediatric provider groups to primary pediatric care may not be stable over time.

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REFERENCES